

THE EFFECT OF COMPETITIVE INTELLIGENCE (CI)
ON THE ORGANISATIONAL PERFORMANCE OF THE
INSTITUTIONS OF HIGHER LEARNING IN
MALAYSIA: MODERATED BY
ORGANISATIONAL FACTORS

BY

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ABSTRACT

Competitive Intelligence (CI) plays an essential role in enhancing the performance of Malaysian Institutions of Higher Learning (IHLs) by providing strategic insights that support effective decision-making. These insights are essential for developing organisational strategies and plans that foster high performance. Both profit-driven and non-profit organisations, including academic institutions, utilize CI to achieve sustainable profitability, financial self-sufficiency, competitive advantage, and improved overall performance. By equipping institutions with a clear understanding of the competitive landscape, CI promotes adaptability and ensures strategic alignment with evolving market demands and organizational objectives. Malaysian IHLs face significant challenges, including curriculum misalignment with industry needs, low research quality, insufficient funding, financial instability, and difficulties in achieving internationalisation. CI addresses these issues by enabling benchmarking against global standards, refining institutional strategies, and improving decision-making processes. Despite its potential, the effective adoption of CI is often constrained by outdated methodologies, inadequate data collection and analysis processes, and organisational barriers such as culture, structure, and limited awareness. This study examines the impact of CI on the organisational performance of Malaysian IHLs, with organisational factors serving as moderating variables. The theoretical foundation of this research is rooted in resource-based theory and knowledge-based theory. Data was collected from a sample of 92 respondents across 594 identified Malaysian IHLs. The findings indicate a significant positive relationship between CI and the organizational performance of IHLs, even in the absence of supportive organisational factors, namely process, structure, awareness, and culture. The findings emphasised the role of CI in generating distinctive resources that enhance institutional performance. This study contributes to the extension of resource-based and knowledge-based theories by exploring the influence of CI on the organisational performance of IHLs. Furthermore, it provides practical guidelines for Malaysian IHLs to identify and improve their performance indicators, ultimately fostering a more competitive and sustainable higher education sector.

الملخص

يلعب الذكاء التنافسي (CI) دورًا أساسيًا في تعزيز مؤسسات التعليم العالي (IHLS) في ماليزيا من خلال توفير رؤى استراتيجية تدعم عملية اتخاذ القرار الفعال. وتعد هذه الرؤى ضرورية لتطوير استراتيجيات وخطط تنظيمية تساهم في تحقيق أداء متميز حتى تستفيد كل من المؤسسة ذات الربحية وغير الربحية، بما في ذلك المؤسسات الأكاديمية، من الذكاء التنافسي لتحقيق الربحية المستدامة، والاستقلال المالي، والميزة التنافسية، وتحسين الأداء العام. يساعد الذكاء التنافسي للمؤسسات على فهم المشهد التنافسي بوضوح، مما يعزز قدرتها على التكيف ويضمن مواءمة استراتيجياتها مع متطلبات السوق المتغيرة وأهدافها التنظيمية. وقد تواجه مؤسسات التعليم العالي الماليزية تحديات كبيرة، مثل عدم توافق المناهج الدراسية مع احتياجات الصناعة، وضعف جودة البحث العلمي، ونقص التمويل، وعدم الاستقرار المالي، والصعوبات في تحقيق التدويل. ويعمل الذكاء التنافسي على معالجة هذه التحديات من خلال تمكين المؤسسات من إجراء مقارنات معيارية على مستوى المعايير العالمية، وتحسين استراتيجياتها المؤسسية، وتعزيز عمليات اتخاذ القرار. وعلى الرغم من فوائده المتوقعة، فإن الذكاء التنافسي بفعالية لا يزال يواجه عقبات، مثل استخدام منهجيات قديمة، وضعف عمليات جمع البيانات وتحليلها، والعوائق التنظيمية المتعلقة بالثقافة المؤسسية، والهيكلي الإداري، وضعف الوعي بأهميته. تهدف هذه الدراسة إلى فحص تأثير الذكاء التنافسي على الأداء التنظيمي لمؤسسات التعليم العالي الماليزية، مع التركيز على العوامل التنظيمية كمتغيرات مُعدّلة. ويستند الإطار النظري لهذا البحث إلى نظرية الموارد ونظرية المعرفة. وقد تم جمع البيانات من عينة مكونة من 92 مشاركًا يمثلون 594 مؤسسة تعليم عالٍ في ماليزيا. وقد أظهرت النتائج وجود علاقة إيجابية قوية بين الذكاء التنافسي والأداء التنظيمي لمؤسسات التعليم العالي، حتى في ظل غياب العوامل التنظيمية الداعمة، وهي العمليات، والهيكلي الإداري، والوعي، والثقافة المؤسسية. كما أكدت النتائج على دور الذكاء التنافسي في توليد موارد

متميزة تسهم في تحسين الأداء المؤسسي. تُسهم هذه الدراسة في إثراء نظريتي الموارد والمعرفة من خلال استكشاف تأثير الذكاء التنافسي على الأداء التنظيمي لمؤسسات التعليم العالي. كما تقدم إرشادات عملية لمؤسسات التعليم العالي الماليزية لمساعدتها في تحديد وتحسين مؤشرات أدائها، مما يعزز قدرتها التنافسية ويسهم في تحقيق استدامة في مجال التعليم العالي في ماليزيا.



APPROVAL PAGE

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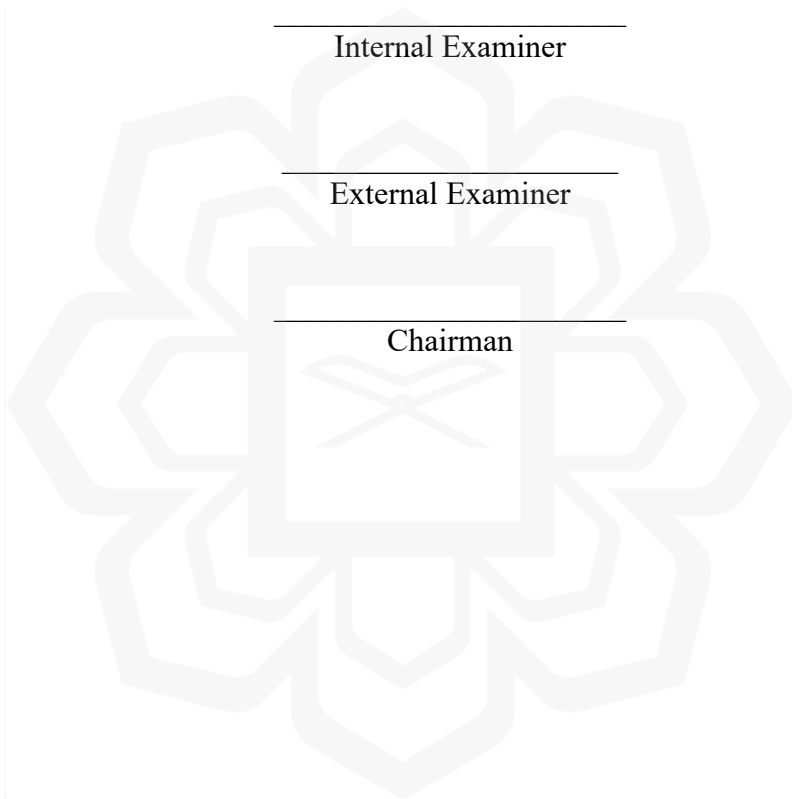
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This research paper is dedicated to my parents especially my late mother Asiah Buyong that always gives her strong support for me to complete my PhD and my father Basri Abu Bakar that laying the foundation of what I turned out to be in life. I want to also express my gratitude to my beloved wife, Salinah Saif that has always motivated me to complete my PhD journey. Furthermore, I am very happy for this opportunity to inspire my children Nisrina Nabihah Ridwana and Muhammad Dayyan Harraz to excel in education and hope to instill in them the belief that there are no limits to what we can achieve in this life through perseverance, commitment and consistency.

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LIST OF ABBREVIATIONS

NHESP	National Higher Education Strategic Plan
BCG	Boston Consulting Group
SWOT	Strengths, Weaknesses, Opportunities and Threats
PESTEL	Political, Economic, Social, Technological, Legal and Environment
MEB	Malaysian Education Blueprint
IHL	Institutions of Higher Learning
CI	Competitive Intelligence
SCIP	Society of Competitive Intelligence Professionals
CA	Competitive Analysis
MoHE	Ministry of Higher Education
RUs	Research Universities
TVET	Technical and Vocational Education and Training
CU	Comprehensive Universities
FU	Focused Universities
MTUN	Malaysian Technical University Network
MQA	Malaysia Qualification Agency
ICT	Information and Communication Technology
VIF	Variance Inflation Factor
IR 4.0	Industrial Revolution 4.0

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Competitive intelligence (CI) improves the performance of institutions of higher learning in Malaysia by providing strategic insights that drive effective decision making. These decisions play a key role in crafting effective organisational strategies and plans which are critical for achieving high performance (Cavallo, Sanasi, Ghezzi & Rangone, 2021; Maluleka & Chummun, 2023; Mohd Asri & Abd Samad, 2024). Organisation, be it profit, and non-profit entity formulates strategies and develops plans for the purpose of sustainable profitability, financial self-sufficient and competitive advantage and improving performance (Madureira, Popovic & Castelli, 2023; Javadi, & Asl, 2020; Jones & Patton, 2020; Vican, Friedman, & Andreasen, 2020; Ko & Liu, 2020; Maier, Meyer & Steinbereithner, 2016). CI plays a pivotal role in strategic planning, ensuring competitiveness and enhancing performance by keeping institutions well- informed about the competitive environment and enabling them to adapt their strategies effectively.

Accurate data analysis is vital for making effective decision, a key factor in crafting organisational strategies and plans. Organisation must have the ability to use accurate data analysis in the formulation of strategies and plans in order to achieve sustainable organisational performance (Kumra & Kumar, 2018; Hossain, Xi, Nurunnabi & Anwar, 2019; Nangoy, Mursitama, Setiadi, & Pradipto, 2020). Intelligence plays a key role in formulating strategies and plans by identifying, boosts organisational performance and ensures survival.

Competitive intelligence (CI), business intelligence (BI) and environmental scanning are three important concepts used by organisations to make informed decisions but each focuses on different areas. Business Intelligence (BI) is mainly on analysing internal data and internal business information, such as sales figures and operational performance, improve efficiency and decision making within organisation (Madureira,

Popovic & Castelli, 2021; Davenport, 2006). Competitive Intelligence (CI) focuses on collecting information about competitors and market trend, helping organisations understand their position in the market and predict competitor actions (Madureira et al., 2023; Prescott, 1999). Environmental Scanning is a systematic process that examines and detecting external factors that can impact the organisation such as political, economic and social changes. It enables the organisations to manage uncertainties, helping them survive and achieve success in today's unpredictable environments (YahiaMarzouk & Jin, 2022; Aguilar, 1967).

Competitive intelligence (CI) emphasises a future oriented approach, enabling organisations to navigate the present while planning for long term success. The characteristics of CI are the forward looking orientation, continuous systematic processes and continuously assessing competitive environment, integration with strategic management, multi-source intelligence gathering and timely delivery of relevant insights for decision making (Madureira et al., 2023; Mokhtar & Yusoff, 2019; Fleisher & Bensoussan, 2015; Prescott, 1999; Dishman & Calof, 2008; Wright, 2011). These characteristics help the organisation to leverage on CI to operate efficiently, respond proactively to market changes and maintain a competitive advantage.

Competitive Intelligence (CI) can be considered superior because it analyses competitor and market trends, providing essential insights for strategic decision making and competitive advantage. CI provides detailed insights into competitor strategies and market conditions which allow the organisations to anticipate market changes and refine their strategies accordingly, identify emerging threats and opportunities, analysing market dynamics leading to more informed strategic decisions and enhanced agility and responsiveness (Wright, 2020; Berg & Conner, 2022; O'Donnell, 2021). Effective use of CI enables organisations to respond to market changes more effectively and secure a competitive advantage.

Institutions of higher learning are not spared from the open system of the environment. These organisations interact with all stakeholders of institutions of higher learning to craft comprehensive strategies and plans through effective decision making. The higher education industry in Malaysia is highly competitive, dynamic and rapidly evolving (Kaur & Singh, 2022; Nair, Sahu & Zulaikha, 2024; Sandrasegaran &

Rambeli, 2024). CI helps IHLs in Malaysia to remain competitive and compliant to the rapid changes of higher education industry by continually conducting market analysis and benchmarking, strategic planning, forecasting and adapting to the changes in the industry.

Institutions of higher learning must also ensure their presence is felt and visible. It can be materialised if IHLs continuously compete to become internationally recognised world-class universities (Sidhu, 2009; Kumra & Kumar, 2018; Hossain, Xi, Nurunnabi & Anwar, 2019; Nangoy et al., 2020) and also excellence in publication, research, and teaching (Sirat, 2013; Caruana, 2016; Nangoy, 2020; Javadi & Asl, 2020; Jones & Patton, 2020). However, the investment made by the Malaysian government into higher education sectors was not commensurate with the actual organisational performance of institutions of higher learning (Chan, 2018; UNESCO Institute for Statistics, 2014).

Competitiveness requires intelligence. Malaysia was ranked 12th out of 50 countries for its commitment to higher education but fell to 44th out of 50 in terms of higher education outputs such as institutional rankings, graduate employability rates, and research output (MoE, 2015; Lee, 2023; Chin Yong & Wong, 2024). Furthermore, IHLs also struggled with operational, management and financial sustainability issues (Malaysia, 2018; Nair, Sahu & Zulaikha, 2024; Chin Yong & Wong, 2024) and the lack of data analysis in decision making has further impeded improvements in teaching, learning, assessment, research, publications and marketing (Ashaari, Abbasi, Amran & Liehana, 2021; Gaftandzhieva, Hussain, Hilcenko, Doneva & Boykova, 2023; Swargiary, 2024). Thus, with all the challenges with IHLs, competitive intelligence addressed the challenges.

Institutions of higher learning often face criticism pertaining to the quality of their education. Institutions of higher learning had not proactively realigned their courses with the latest industry needs and demands which leads to criticism on the relevance, applicability of their academic programmes and accreditation according to international standards (Moo & Da Wan, 2023; Nair, Sahu & Zulaikha, 2024; Isa, Sharaf Noor & Ahmdon, 2024). Irrelevance and outdated curriculum created a gap between the graduates skills and those required by employers (Kamaruddin & Yusof,

2023; Abdullah & Rahman, 2023). CI assists institutions of higher learning by benchmarking their programmes against global standards and competitors and providing insights into areas needing improvement.

Institutions of higher learning were also struggled to produce high quality and impactful research publications compared to global standards reflected in low publication rates and citations. Institutions of higher learning had to deal with insufficient funding for high impact research project that also limit the scope and quality of research and visibility of their research outputs (Tan & Goh, 2024; Hassan & Ahmad, 2023). Moreover, research, development and innovation efforts were also hindered by lack of coordination and fragmentation resulting from inadequate collaboration among public higher learning institutions, research entities and industry (MOE, 2018; Nair, Sahu & Zulaikha, 2024; Chin Yong & Wong, 2024). CI helps the institutions of higher learning in providing insights into emerging trends, competitor activities, and market dynamics. It enables them to make informed decisions about research priorities, investment areas and strategic directions in producing high quality publication.

Institutions of higher learning in Malaysia had to deal with inadequate funding and financial instability. Public IHLs have to deal with budget cuts from the government while private IHLs have to address high operational costs (Abdullah, 2017; Tam, 2018; Sirat, 2024; Jayabalan & Dorasamy, 2024). It would be difficult for them to invest in infrastructure, research, faculty development and provide quality education (Anis, Islam & Abdullah, 2018; Fadzil, Samad, Nawawi, Pandi & Puteh, 2022; Kalam & Hossain, 2023). All of these factors contributed to the diminishing the global competitiveness of the IHL which requires IHLs to innovate their strategies to navigate a competitive higher education market (Ahmad & Farley, 2013; Tham, 2018; Lee & Aziz, 2022). CI contributes to discovering effective models and financial strategies implemented by top universities worldwide especially exploring alternative revenue sources and efficient cost management practices.

Institutions of higher learning in Malaysia have not yet met their internationalisation objective. They struggled to attract international students and to establish global partnerships which impacted their global competitiveness (Mohammad & Othman, 2023; Sirat, 2024; Chin Yong & Wong, 2024). Institutions of higher

learning in Malaysia need to compete with well-established education hubs such as United States, United Kingdom and Australia (Beine, Noel & Singh, 2022; Sirat, 2024; Sandrasegaran & Rambeli, 2024). CI offers crucial insights into competitors' capabilities enabling institutions to design targeted marketing strategies to attract international students (Mgweba, Rawjee & Naidoo, 2024; Hart & Rogers, 2024). Additionally, CI helps identify potential partners and collaborations that align with institutional goals thereby enhancing their global presence.

Organisation performance of institutions of higher learning includes financial self-sufficient which is undeniably crucial for the operation and survival of all IHL. Public universities heavily rely on government funding while private institutions frequently face challenges due to high operational costs and competition (Abdullah, 2017; Tam, 2018; Sirat, 2024; Nair, Sahu & Zulaikha, 2024). Thus, they must generate money to survive (Sirat, 2010; Mok, 2011; Caruana, 2016; Nangoy, 2020). In doing so, IHL are expected to operate similarly to profit entities (Mok, 2011; Vican et al., 2020; Cheng et al., 2020; Javadi & Asl, 2020; Jones & Patton, 2020). Thus, competitive intelligence helps IHL to understand competitive higher education landscape so they can optimise their resources and strategies effectively.

The Malaysian government has prioritised the education sector as a key driver for national income generation and socio-economic development. The Government of Malaysia has targeted the education industry to generate income for the country (Yusof & Salleh, 2013), socio-economic and community development (Sirat & Wan, 2016; Sirat 2023; OECD, 2015; Pink-Harper, 2015). It could only be done if institutions of higher learning have the ability to continuously produce an educated workforce that emphasises the development of human capital and institutional intellectual capital (Pink-Harper, 2015; Nair, Sahu & Zulaikha, 2024, Sirat, 2024), which will attract international investment (Wan, Chapman, Hutcheson, Lee, Austin & Zain, 2017).

Malaysia's aspiration to become a centre of higher education excellence demands major reforms across its institutions higher learning. Malaysia has been targeted to become the hub of higher education excellence by 2020 (MoHE, 2007; Da Wan & Lim, 2023; Sirat, 2024). Despite budget constraints and rising operating costs, institutions of higher learning are forced to improve efficiency, productivity, and

financial sustainability (MoE, 2015; Sirat, 2024; Chin Yong & Wong, 2024) to remain operational and viable in the highly competitive higher education industry.

Institutions of higher learning contribute to both education and community service but there remains a critical gap in developing skills required by the various industries. IHL were not also accentuated on teaching and research but also on providing service to the university and outside community, maximising added value to the society (Johnes, 1992; Power, 2015; Avelar & Pajuelo-Moreno, 2024; Cembranel, Gewehr, Dal Moro, Fuchs, Birch & Andrade Guerra, 2024), inculcating entrepreneurial culture and sustainable development (Rubens, Spigarelli, Cavicchi & Rinaldi, 2017). However, institutions of higher learning were found to have yet to develop comprehensive skills that could be aligned with the needs of various industries (Taskinsoy, 2020; Moo & Da Wan, 2023; Mahmud, Kamaruzuki, Yusoff Z, Yusoff S & Yahya; Isa, Sharaf, Noor & Amdon, 2024).

Institutions of higher learning have a role in producing balanced graduates. The dimensions of balanced graduates contributed to national productivity and competitiveness (Muftahu, Annmali & Xiaoling, 2023; Chin Yong & Wong, 2024; Yong, Chin, Uie, Lee & Kong, 2024). In addition, the balanced graduates should be innovative and ready for the advanced of contemporary societies (Moo & Da Wan, 2023; Sirat, 2024; Chin Yong & Wong, 2024). Thus, CI has a role to assist IHLs to achieve such requirements.

Remaining competitive is crucial to ensure an organisations's performance. In order to remain competitive in the higher education industry, the operation of institutions of higher learning must be outstanding, up-to-date, and relevant curriculum and focus on customer-centric (Chinta, Kebritchi & Ellias, 2016; Muftahu, Annmali & Xiaoling, 2023; Sirat, 2024; Chin Yong & Wong, 2024). Therefore, to address the aforementioned issues, the forward-looking institutions of higher learning should embrace CI due to its characteristics, which are dynamic and progressive in nature. Institutions of higher learning will be able to streamline their operational processes, develop new academic programmes and enhance overall student experience as CI helps them anticipate and adapt to the latest industry trends.

Organisational factors are essential for an organisation's success and effectiveness as they significantly impact overall performance. It represents the capabilities and processes that enable organisation to coordinate its resources efficiently and use them productively (Waithaka, 2016). It includes clear and well structured and organised process, culture and awareness (Saayman et al., 2008; Waithaka, 2016). These factors help organisations to collect and analyse information about competitors and market trends for a timely decision making and better strategic decisions (Madureira, Popovic & Castelli, 2023a).

1.2 PERFORMANCE MEASUREMENT

Systematic performance measurement requires performance indicators to ensure accountability, programme development (Asif & Searcy, 2014a), meet the demand from various stakeholders, and performance excellence (Asif & Searcy, 2014b). The main objectives of the performance measurement are to improve the quality and efficiency of higher learning institutions, making them visible and recognisable (Pollard, Williams, Williams, Bertram & Buzzeo, 2013).

Performance measurement requires extensive analysis. More in qualitative research, consultancy, and networking instead of lectures, tutorials, and practicum (Vican et al., 2020; Cheng et al., 2020). Business performance can be measured based on average sales, market share, profitability (Cappel & Boone, 199), profit and revenue growth (Yap & Rashid, 2011), liquidity, growth, and stock market (Hamann, Schiemann, Bellora & Guenther, 2013). Nevertheless, it is quite challenging for institutions of higher learning to have a standard performance measurement due to the involvement of multiple inputs in producing multiple outputs (Cave, Kogan & Hanney, 1989) and differences in their strategic aims and visions (Pollard, Williams, Williams, Bertram & Buzzeo, 2013).

Performance measurement in the institutions of higher learning could only be effective if the issue determining the quality is being resolved (Cave, Kogan & Hanney, 1989). The performance indicators for institutions of higher learning must be specific, measurable, achievable, reasonable, and time-based (Drucker, 1954), achievability,

relevance and manageability (Broshkov, Forostian, Kichuk, Liapa Horbashevskaya & Kakhiani, 2020) while intelligence must be measured based on accuracy, timeliness, and usefulness (Gainor & Bouthillier, 2014). Thus, the generation of Competitive Intelligence (CI) should consider the comprehensiveness, timeliness, accuracy, and efficiency (Jaworski, Macinnis & Kohli, 2002).

The strength of CI is its adaptability to the increasing and highly competitive environment (Cantonnet, Aldasoro & Cilleruelo, 2015), which contributed to good decision-making and, subsequently, better organisational performance (Yap & Rashid, 2011). Still, its efficacy relies on the extensive network, reciprocity, knowledge and absorptive capacity use as well as the richness, divergence and information value of the information environment (Jaworski, Macinnis & Kohli, 2002; Hassani & Mosconi, 2021).

Undeniably, the use of CI impacts the competitiveness of an organisation (Nasri, 2011), improves organisational performance (Lopez, Otegi, Gomez & Rosale, 2020, sustainability of competitive advantages (Madureira, L., Popovič, A., & Castelli, M., 2021) and organisational agility and superiority (Tooranloo & Saghafi, 2019). All these benefits could not be achieved if there is no clear identification and determination of key intelligence and information needs (Maungwa & Fourie, 2018), inappropriate analysis of information (Garcia-Alsina et al., 2013; Wright et al., 2009), communication barriers, and ignoring the value of CI (Koseoglu, Ross & Okumus, 2016).

The performance of an organisation relies on effective & quality decision-making (Oubrich, Hakmaoui, Bierwolf & Haddani, 2018; Du Toit, 2003) contributed by the quality and timely CI (Nenzhelele, 2015). Quality assurance in every CI process, top management support, clearly defined key intelligence needs, consistent awareness of CI, and formal CI practice in the organisation determine the quality of CI (Nenzhelele, 2015).

Information technology, competitors' information, organisational culture, and knowledge sharing affect CI in an organisation (Asghari, Targholi, Kazemi, Shahriyari & Rajabion, 2020) and organisations that have CI activities managed to maintain their competitive position in the market (Cantonnet et al., 2015). However, the absence of

profit orientation, refrain from any academic dispute, discord in the principles and practices of competitive intelligence, and lack of resources have dampened the use of CI in higher education (Hughes & White, 2005).

The Government of Malaysia has targeted the education industry to generate income for the country (Yusof & Salleh, 2013), socio-economic and community development (Sirat & Wan, 2016; Sirat 2023; OECD, 2015; Pink-Harper, 2015). It could only be done if institutions of higher learning have the ability to continuously produce an educated workforce that emphasises the development of human capital and institutional intellectual capital (Pink-Harper, 2015), which will attract international investment (Wan, Chapman, Hutcheson, Lee, Austin & Zain, 2017).

IHL were not also accentuated on teaching and research but also on providing service to the university and outside community, maximising added value to the society (Johnes, 1992; Power, 2015), inculcating entrepreneurial culture and sustainable development (Rubens, Spigarelli, Cavicchi & Rinaldi, 2017). However, institutions of higher learning were found to have yet to develop comprehensive skills that could be aligned with the needs of various industries (Taskinsoy, 2020).

Institutions of higher learning were not only entrusted to produce balanced and innovative graduates and to be wealth creators for the country but also to prepare the graduates for the advent of the knowledge-based economy and learning-intensive society (Ithnin, Sahib, Eng, Sidek & Harun, 2018), and to be the agent in improving national productivity and competitiveness (Power, 2015).

In order to remain competitive in the education industry, the operation of institutions of higher learning must be outstanding, up-to-date, and relevant curriculum and focus on customer-centric (Chinta, Kebritchi & Ellias, 2016). Therefore, to address the aforementioned issues, the forward-looking institutions of higher learning should embrace CI due to its characteristics, which are dynamic and progressive in nature.

The performance of IHL has been developed with good financial commitment. Potential income sources for IHL include revenue generated from academic and research programs, asset monetization, retailing and services, financial management

activities and investments, corporate alliances for business ventures, endowments, waqf, and fundraising (Ahmad, Ismail & Siraj, 2019; MOHE, 2016). The income can be utilised for their operation, capital for investment as well as auxiliary and special funds (Barr and McClellan, 2018).

Malaysia was ranked 12th out of 50 countries in terms of commitment towards higher education but ranked 44th out of 50 for higher education outputs such as institutional rankings, graduate employability rates, and research output (MoE, 2015). Malaysia has been targeted to become the hub of higher education excellence by 2020 (MoHE, 2007). Despite budget constraints and rising operating costs, institutions of higher learning are forced to improve efficiency, productivity, and financial sustainability (MoE, 2015).

1.3 POLICY FOR HIGHER EDUCATION

Higher education institutions need guidance in the performance of high education institutions. The imposition of several policies on the institutions of higher learning by the government was done to ensure the delivery of education services meeting the current needs and the target of producing competitive graduates in the global marketplace could be achieved (Zain, Aspah, Abdullah & Ebrahimi, 2017; Neville, 1998).

Malaysia National Higher Education Plan (2007-2010), the National Higher Education Strategic Plan (NHESP), the Malaysian Education Blueprint (MEB) 2015-2025, and National Transformation 2050 are the primary references for all the institutions of higher learning that contain various strategies to transform Malaysia into an international hub of excellence for higher education. To compete globally, MEB (HE) 2015-2025 has stated plans to create a higher education system that will be on par with other world's leading higher education systems.

Malaysia is targeting to improve the employability rate to 80% by 2025, increase the enrolment rate from 48% to 70%, improve world ranking, and improve the ranking for research output (MoE, 2015). It can only be fulfilled if institutions of higher learning

have established systematic and consistent processes in analysing the market environment and are supported by relevant resources.

Malaysia also envisions becoming one of the top 20 nations by the year 2050, and it can only be realised by attracting high-quality investments. High-quality investments would create more high-paying and skilled jobs for the local workforce. The institutions of higher learning must prepare the students for the demands of the workforce (Yoong, Don, & Foroutan, 2017) and transform Malaysia into a developed and highly industrialised nation by 2020 (Ithnin et al., 2018).

1.4 COMPETITIVE ADVANTAGE

Competitive advantage is the state of being able to exceed the advantage of other competitors. The sustainable competitive advantage of Institutions of higher learning can only be secured if they can respond to the dynamic changes and uncertainties of the higher education sector (Chan, 2018; Teece, Pisano, & Shuan, 1997). Therefore, CI is a beneficial approach that can be used by any organisation to better understand the competitive environment (Talaoui & Rabetino, 2017; Wright, Eid, & Fleisher, 2009), formulating actionable strategy and sound decision making (Cavallo, Sanasi, Ghezz & Rangone, 2020; McGonagle & Vella, 1990), and for a sustainable competitive advantage (Chawinga & Chipeta, 2017; Strauss & du Toit, 2010; Grant, 1996).

1.5 COMPETITIVE INTELLIGENCE (CI)

CI exists in many forms and contexts. It may not be in the computer system with databases and intelligence ability to search and retrieve various important files and comments. There could be a manual approach to maintain the performance.

CI is ubiquitous in for-profit organisations. However, it is uncommon to see such competitive intelligence being used to formulate strategies in the public sector (Amiri, Shirkavand, Chalak & Rezaeei, 2017; Kumra & Kumar, 2018; Hossain, Xi,

Nurunnabi & Anwar, 2019; Nangoy et al., 2020). Thus, there is an urgent need for a CI practice among institutions of higher learning to be responsive to the rapid changes in the market environment and improve their performance.

The CI process is dynamic. It involves the systematic process of data collection about the environment, transforming the data into useful business information, analysing the information received, and formulating decisions based on the analysis (Kumra & Kumar, 2018; Hossain, Xi, Nurunnabi & Anwar, 2019; Nangoy et al., 2020). Internal strengths and weaknesses must be considered before any decision can be finalised to ensure it is in tandem with the company's plans and long-term direction (according to the Society of Competitive Intelligence Professionals (SCIP) in 2008).

On the other hand, Competitive Analysis (CA) allows an understanding of variables and constructs through various sources. According to Zahra, Neubaun, and El-Hagrassey (2002), practical CA exists to succeed in the marketplace. Such an idea was based on Makadok and Barney's (2001) theory of information acquisition strategy to create a competitive advantage for the organisation. Indeed, Bose (2008) argued that specific tools and techniques are needed to encounter specific types of problems in the industry. In contrast, it is commonly seen in private sectors, such as business companies.

In practice, the level of competitive intelligence practice varied among communities of practice. Some companies use specific competitive intelligence in strategic planning (Nasri & Zarai, 2013). Zangouinezhad and Moshabaki (2009) argued that the information system is critical in CI practice in order for the organisation to gain a competitive advantage. The use of competitive intelligence provides the reality of market competitiveness that enables companies to outcompete and leverage their companies against their business rivals (Täuscher, 2017). Needless to say, there is no excuse to avoid CI tools.

CI is about being able to have comprehensive coverage. Social media (He, Tian, Chen & Chong, 2016) has been used to understand and monitor customers' needs so that the organisation can increase its competitive advantage. Therefore, by formalising CI activities, the organisation could gain a competitive advantage and be ahead of its rivals.

Most successful companies have long established and formulated integrated and coordinated CI. They have established specific departments and strengthened them with the most capable personnel, enabling them to respond to the changes in the market environment. Responsiveness and efficiency of the department will further improve the firm's competitiveness and strategic planning process (Sepahvand, Nazarpouri & Mohammad Veisi, 2016).

The organisation can plan for comprehensive decision-making by exploring several techniques in analysing industries and competitors (Porter, 1980), developing strategic intelligence systems and intelligence services (Montgomery & Weinberg, 1998; Montgomery & Weinberg, 1979), developing business intelligence systems (Pearce, 1976; Pearce, 1971), integrated marketing information system (Montgomery & Urban, 1970), marketing intelligence (Guyton, 1962) and also big data powered artificial intelligence (Bag, Gupta, Kumar & Sivarajah, 2021).

1.6 BACKGROUND OF MALAYSIA HIGHER EDUCATION

IHL in Malaysia played a vital role in supporting the New Economic Policy launched by the government by focusing on talent-specific so that development in manufacturing and heavy industries, as well as service-oriented sectors, could be stimulated (Naguib & Smucker, 2009; Sirat, 2010; Mok, 2011; Caruana, 2016)). Large numbers of public and private institutions of higher learning were established to meet the increasing demand for higher education.

1.6.1 History

British, during their occupation in the 1900s to 1940s, were not committed to developing higher education for Malayan citizens (Stockwell, 2009) as the Malayan economy at that time was very much dependent on agriculture and tin mining activities which were performed by unskilled labour (Abdullah, 2013).

The British Government set up college education only to produce qualified human resources that would be placed in the education and healthcare sectors. College education served only a small number of populations, and then, there was no university education for Malayan citizens (Stockwell, 2009).

In the 1960s, higher education had to support the economic growth of the newly independent government. They had to produce professional human resources in the science and technology streams. The main reason for establishing two universities, namely the University of Singapore and the University of Malaya, as a result of the separation of Singapore from Malaya in 1962 was to produce professional classes who would become elite in Malaysian society (Abdullah, 2013).

1.6.2 Policy

The government launched *Dasar Ekonomi Baru* (New Economic Policy) in 1970 as a result of the race riots that happened in 1969 after the general election. Bumiputera enrolments in higher education had to be increased to reduce the economic gap between Bumiputera and other races. The quota system was introduced, and 55% of the seats were allocated for Bumiputeras, 35% for Chinese, and 10% for Indians and other races (Singam, 2003). The government continued to improve and enhance educational infrastructure, as stated in the 3rd and 4th Malaysian Plan (Abdullah, 2013).

Vision 2020, coined by the former Prime Minister of Malaysia, Tun Dr Mahathir Mohamad in 1991, changed the landscape of higher education. In order to become a developed and industrialised nation, higher education had to produce more skilled workers to support the manufacturing industry. Strong and resilient higher education was needed to ensure that there would be a balance between workforce supply and demand. Furthermore, skilled workers could ensure long-term and sustainable economic growth (Abidin, 2011).

The Government of Malaysia has realised the importance of the k-economy, which requires a strong human resource base to support the knowledge-based economy and has formulated various plans and strategies in the 8th and 9th Malaysian Plans. The

government was committed to having an efficient and responsive education and training system to meet the demand for a knowledgeable and highly skilled labour force. By having the system, the country would be able to produce graduates with the right skills, knowledge, and attitudes to meet industry-specific needs (Malaysia, 2006).

1.6.3 Ministry

The establishment of the Ministry of Higher Education (MoHE) in 2004 had further increased student enrolments in higher education. The government of Malaysia introduced the National Higher Education Strategic Plan 2020 in 2007 and the National Higher Education Action Plan 2007-2010 with a focus on stimulating the excellence of higher education in Malaysia (Country Report-Malaysia, 2008; Sirat, 2009).

The focus of the policies involved the performance, quality, delivery systems, governance, employability, marketability, research and development, and internationalisation of higher education in Malaysia (MoHE, 2007a, 2007b). These policies were necessary to respond to the global challenges for the internationalisation of higher education (Sirat, 2009). Public universities are expected to finance 25% of their operating expenditure and 5% of development, with Research Universities (RUs) financing 30% of their operating expenditure and 10% of development expenditures 2016-2020.

1.6.4 Roles

Institutions of higher learning in Malaysia play a vital role in producing highly capable human capital in order to boost the national economy (Reza, 2016). In the 10th Malaysian Plan, the government put aside 40% of its budget for the development of human capital, while in the 9th Malaysian Plan, 21.8% was allocated to develop human capital. Now, Malaysia has 20 public universities, 41 private universities and university colleges, and 485 private colleges.

RMK 11 mid-term review has highlighted underemployed graduates due to a job mismatch, high youth unemployment and slow wage growth, and over-dependence on low-skilled foreign workers. The Critical Skills Gap Committee under the Industry Skills Committee has developed a Critical Occupation List to address the disparity between skills imbalance jobs (EPU, MOEA, 2018).

The higher education and Technical and Vocational Education and Training (TVET) curriculum will be regularly reviewed to meet the industry's fast-changing requirements and demands. The quality of graduates and academic programmes will be improved, and research capabilities will also be strengthened. Higher education has also emphasised achieving excellence in the governance of IHL.

IHL are expected to ease the development of the international research hub to cultivate an innovative and creative environment. The hub's success heavily depends on the ability to produce new knowledge and use it effectively. Institutions of higher learning are encouraged to build up local capacity, improve learning infrastructure, create a pool of local talent, and establish university-industry linkages and collaborations (MoE, 2015).

1.7 BACKGROUND OF INSTITUTIONS OF HIGHER LEARNING IN MALAYSIA

Currently, Malaysia has 20 public institutions of higher learning, which consist of 5 RUs, 4 Comprehensive Universities (CU), 11 Focused Universities (FU), 4 Malaysian Technical University Network (MTUN), and 480 private universities. Other than that, from 480 private institutions of higher learning, 53 are private universities, 37 are University Colleges, 10 are Branch Campuses, and 380 are private colleges. 36 Polytechnics and 95 Community Colleges have been established to support the global trends and demand of the public for access to tertiary education (Yap, 2018).

RUs focus more on postgraduate programmes and strengthening research activities in various disciplines, while CUs offer various courses and fields of study. FUs are known to offer programmes that are related to their origins. The RUs are

targeted to improve the higher education system with assistance from highly qualified staff and also high-performing students. RUs are designed to lead innovation, are expected to be the center of excellence in niche areas of the country, generate world-class research outputs and high-impact research publications, and entice high-class graduate students (MoHE, 2004).

The government established CUs, FUs, and private institutions of higher learning to increase access and opportunity to higher education. CUs offer bachelor's programmes, while FUs offer bachelor's and diploma programmes. Polytechnics have been entrusted to produce semi-skilled and middle-level workers, especially in technical fields, while community colleges provide skills and vocational training required for employment (MoE, 2015).

The establishment of private institutions of higher learning together with 11 foreign university branch campuses has supported the aspiration of Malaysia to become an international higher education hub (MoE, 2015) and also minimise the number of Malaysian students studying abroad (Grapragasem, Krishnan, & Azlin, 2014). This initiative would further attract international students to study in Malaysia and bring additional government revenue (Lee, 2014).

The Ministry of Education has directed all academic programmes offered by institutions of higher learning to be accredited, and the Malaysia Qualification Agency (MQA) has been given the authority to ensure all institutions of higher learning adhere to the standard. Vigorous and regular assessments are required to ensure the quality of programmes adheres to the requirements of MQA and its stakeholders (Hairi, Affandi & Nasri, 2019). Maintaining quality education ensures the sustainability of institutions of higher learning, especially private IHL, in the era of globalisation (Anis, Islam & Abdullah, 2018; Ali, Ahmad, Zakaria, Arbab & Badr, 2018).

The collection and analysis of data for the assessment conducted by all the institutions of higher learning in upgrading their academic programmes were based on alumni and employer surveys as their main instruments. Community colleges and polytechnics use various outcome-based instruments but do not specifically assess the achievement of the programmes (Hairi, Affandi & Nasri, 2019). CI requires clear focus

and planning in order to get the right information and important areas for further analysis and decision-making. Malaysian private institutions of higher learning practice environmental scanning that helps them be responsive to internal and external market changes by identifying threats, grabbing potential new opportunities, and formulating suitable strategies for effective actions (Chan & Muthuveloo, 2019).

Sharing of information in the private institutions of higher learning due to strong internal and external collaboration helps them to foresee threats and opportunities, be conversant with the changes and trends of the existing academic landscape, and transpire new ideas and strategies for better organisational performance (Chan & Muthuveloo, 2019). Benchmarking against other foreign and local universities' market surveys was also used by institutions of higher learning in Malaysia to improve or eliminate irrelevant academic programmes and accelerate their performance (Aman, Mohamed & Siswantoyo, 2019).

In the highly competitive education industry, CI, which considers information from all stakeholders, especially the customer, will be used by the IHL in their decision-making in providing quality products or services. Other than that, they offer a wide range of products/services, promoting and maintaining good service and loyalty among their current customers and always responsive to their needs (Carter & Yeo, 2016). Malaysian institutions of higher learning have yet to fully embrace customer-orientation practices as they were unable to include customer emotions in their product or service (Carter & Yeo, 2016).

1.8 STRATEGIC TRENDS IN MALAYSIA HIGHER EDUCATION POLICIES

Since independence, Malaysia's higher education policies have undergone several transformations to suit the current market demand. From the 1950s to the 1990s, the government implemented a mass system of higher education to diversify higher education. More public institutions of higher learning were established, together with the establishment of private IHL, polytechnics, and community colleges (Abdullah, 2013).

The government established private IHL because the public institutions of higher learning were unable to meet the growing demand for higher education. Polytechnics and community colleges provide middle-level technical training and the opportunity to pursue tertiary education. They provide educational opportunities to all, regardless of background and socioeconomic status (Abdullah, 2013).

In the 1990s, higher education had moved towards a business-oriented strategy emphasising quality practices (Kanji, Tambi & Wallace, 1999) to improve the sector's productivity (The Star, 1994; Utusan Malaysia, 1995). Changing demands in higher education have made countries such as Malaysia leverage quality management and service quality (Papanthymou & Darra, 2017).

In the 2000s, it was found that the higher education ecosystem had focused on the knowledge society, integration of Information and Communication Technology (ICT) in the teaching and learning process, striving to compete and meet international and regional standards and to be responsive to globalisation. It had to be done as Malaysia aims to be excellent regionally and internationally through university ranking (Asmawi & Jaladin, 2018).

Higher education embarked on Education 4.0 in 2018 due to the Industrial Revolution 4.0 (IR 4.0). Education 4.0 encourages future talents to be job creators, not job seekers, to compete globally. Education 4.0 still focuses on producing holistic and balanced graduates with humanistic competencies that can contribute to nation-building (Tapsir & Puteh, 2018).

1.9 PERFORMANCE INDICATORS FOR INSTITUTIONS OF HIGHER LEARNING

Performance indicators for IHL include their performance in the research, teaching (Cave, Hanney, Kogan & Trevett, 1988), service, and finance (Asif & Searcy, 2014), internal, external, and operational (Ball & Wilkinson, 1994). Ball and Wilkinson indicated that internal performance indicators comprise the market share of undergraduate applications by subject, graduation rates, and classes of degrees.

Destination of graduates, publications by staff, and citations were classified under external performance indicators, while unit costs and staff/student ratios were categorised under operational (Court, 2012; Ball & Wilkinson, 1994).

HLIs have to strive for excellent performance due to the competitive market environment, budget cuts by the government forced improvement of internal performance, and demand from stakeholders to create value for money (Asif & Searcy, 2014b). The performance of private and public institutions of higher learning could also be divided into financial and non-financial aspects. Non-financial aspects include academic effectiveness, rating criteria, and research capacity, while the financial aspect focuses on the total operating revenues and viability ratio to measure universities' performance and reduce their operating expenses (Yaakub & Mohamed, 2019; Siraj, Ahmad & Ismail, 2016).

Academic effectiveness/teaching performance includes the ability of IHL to ensure the quality of academic programmes, develop new academic programmes or services, attract and retain essential academicians, sustain students' satisfaction, sustain good relations between management and other academicians and sustain good relations among academicians in general (Delaney & Huselid, 1996). Thus, it requires extensive and regular monitoring of the internal and external environment. The outcomes of academic effectiveness that can be measured by HLIs are graduate employability (Hrnciar & Madzik, 2017; Johnes, 1996) and graduation rate (Agasisti, 2011).

Rating criteria through MyQuest ranking measures the performance of institutions of higher learning that include students (quality, participation with an external organisation, number of international students, resources (physical infrastructure, financial sustainability, support services, staff ratio), quality management system (certification, good management system, external participation, student satisfaction index), programme recognition (accredited programmes, active programmes), and graduates' recognition (employability, employer satisfaction, recognition and award to students) (Yaakub & Mohamed, 2019).

Research performance includes total research grants obtained, research completed on time, research produced to meet the objective, involvement of

academicians/industry in research works, involvement of students in research works, and a number of impactful research on the community (Yaakub & Mohamed, 2019). Number of publications, number of peer-reviewed journals, number of citations, postgraduate research students, and research income (Hien, 2010; Patrick & Stanley, 1998; Cave, Hanney & Hankel, 1995; Gaither, Nedwek & Neal, 1994) could also be used to measure research performance. However, the number of peer-reviewed journals and citations are relatively related to the quality of research (Hien, 2010).

Financial performance refers to the ability of private institutions of higher learning to generate higher profit, higher return on investment and the ability of the public IHL to reduce their operating expenses (Yaakub & Mohamed, 2019; Siraj, Ahmad & Ismail, 2016).

The performance of IHL is sustainable if it can produce academic leaders with the right mix of knowledge, skills, and attitudes (Reza, 2016). Nevertheless, quality assurance initiatives and balanced scorecard initiatives strengthened by sufficient supervision also significantly impacted the sustainability of higher learning institutions (Ali, Ayodele & Ibrahim, 2019). Students' citizenship behaviour (Manzoor, Ho & Mahmud, 2020) as a result of student's satisfaction with the university's external communication and values, national and international awareness, economic value, and university facilities (Alcaide-Pullido, Alves, Gutierrez-Villar, 2017) contributed to the sustainability of institutions of higher learning.

Therefore, IHL should regularly assess the effectiveness of their current curriculum and modules and make necessary adjustments after conducting an in-depth study (Reza, 2016). IHL had to support the creation of a knowledge-based economy that could only materialise with the development of human capital through wide access to education (Abdullah & Rahman, 2011). It can materialise by enhancing programme effectiveness and quality of students, strong research and innovation for excellent outcomes, and governance (Da Wan, Sirat & Razak, 2018).

Malaysian IHL have extended their focus on research, innovation, and high-quality education and ensured their financial sustainability (Abdullah & Rahman, 2011). Quality research and development must be improved so that domestic firms have

the opportunity to upgrade their technology (Da Wan, Sirat & Razak, 2018). Malaysian graduates were also found not to possess skills beneficial to modernising the high-technology economy (Da Wan, Sirat & Razak, 2018).

Strong entrepreneurial orientation proved important in improving the firm's performance, innovativeness, and strategic flexibility (Zahra, 2008; Wiklund & Shepherd, 2003; Balasubramanian, Yang & Tello, 2020). Entrepreneurial orientation as the basis for competitive intelligence practice and the also formulation of strategic planning possessed by the individual or embraced by management will ease the transfer of knowledge across the industry (Gibb, Haskins & Robertson, 2013), bring financial benefits (Phan & Siegel, 2006) and improve the local economy (Di Nauta, Merola, Caputo & Evangelista, 2018).

Market orientation is important to ensure the success of competitive intelligence practices and will make private IHL aware of the latest business trends and track their competitors. The performance and improvement of institutions of higher learning market position can be secured due to efficient strategic plans, investments, and reliable market intelligence (Ismail, Mahmood Rahim, 2012; Chan & Muthuveloo, 2019).

1.10 STATE OF THE FORMULATION OF POLICY IN MALAYSIA

Policy in Malaysia is formulated and analysed by the central agency and not the line agency that will implement and maintain the policy. The government must formulate and analyse the policy to address an issue brought up by the groups close to the government. The proposal for any new policy is also controlled by the ruling political parties (Ansori, 2013).

The preference of the government only to the ruling political parties or high-ranking government officials reduces the chances of obtaining myriad and comprehensive ideas, views, and suggestions from the public (Pierre, 1998) and also leads to the autocracy of power and privileges (Seidman, 2016; Seidman & Seidman, 1994). High-ranking officials had an influence on the public servants to execute ambiguous and technically unsound decisions (The Sun, 2008).

Political elites and senior officers dominate the formulation of policy in Malaysia (Ansori, 2013; Yeoh, 2008), with less involvement of the middle and junior officers in the processes (Nayan, 2008). Junior and middle-level officers in Australia are involved in analysing the policy and selecting the instruments as they have the privilege to access the information, the corporate knowledge, and ample time for in-depth policy analysis. (Ansori, 2013).

1.11 PROBLEM STATEMENT

Competitive intelligence (CI) is a vital component of strategic management. CI identifies external factors through environmental scanning, provides valuable insights of organisations's competitive advantages and areas for improvement, developing effective strategies and plans and assessment on the effectiveness of organisation's strategies (Cosway, 2018; Markovich & Schilke, 2019 and De Almeida & Kahaner, 2016). However, institutions of higher learning in Malaysia struggle to effectively using competitive intelligence to guide their strategic planning and decision making (Tahmasebifard & Wright, 2018; Amiri, Salguero & Alzahrani, 2017). CI is not simply about collecting data but also transforming that information into strategic insights that drive strategic initiatives. This foster an environment of adaptability and sustained growth, allowing organisation to secure their competitive advantage while staying aligned with industry trends.

Competitive intelligence (CI) is a systematic approach aimed at enhancing effective decision making. This research discusses four phases of CI which is also known as intelligence cycle as evidenced in previous literature: Planning & focus, collection, analysis and communication (Fleisher, 2004; Nasri, 2011). However, it was found that the absence of a university-wide assessment process for collecting, analysing, and disseminating competitive information had limited their ability to respond to market changes, miss the opportunities for innovation and improvement and hinder the ability to implement effective strategies and encounter any threat to their operation appropriately and effectively (Waiganjo, Muturi & Muli, 2012; Garcia-Alsina, Cobarsi-Morales & Ortoll, 2016; Garcia-Alsina, 2011; Hughes & White, 2006). Thus, these

phases are proposed as independent variables in the study with evidence suggesting that this systematic and structured approach is likely to have a positive effect on organisational performance.

The effectiveness of CI in supporting strategic and effective decision making also relies heavily on high quality, accurate, relevant and timely data. However, IHL face challenges such as incomplete dataset, slow data collection, lengthy process in data analysis, outdated and irrelevant information, and overreliance on traditional methods of data collection and analysis (Cosway, 2018; Markovich & Schilke, 2019 and De Almeida & Kahaner, 2016; Abdullah & Mohd Zaid, 2023). Additionally, each institutions may collect and analyse data differently which limits their ability to aggregate information for a comprehensive CI analysis (Abdullah & Mohd Zaid, 2023). Consequently, these challenges impede IHL from fully utilising CI which leads to inaccurate CI analysis that adversely affect both strategy formulation and implementation.

This study also investigated how organisational factors particularly process & structure, as well as awareness & culture, moderate the relationship between competitive intelligence (CI) and organisational performance. Yap & Rashid (2011) and Asri & Mohsin (2020) confirmed that CI has a significant effect on organisational performance, enhancing strategic decision making and operational outcomes. They also recommended further research into how specific organisational factors such as process & structure and awareness & culture could potentially affect the success of CI. These factors could play a critical role in determining the success of CI strategies in driving performance improvements.

Numerous studies in the past revealed the positive results toward CI in higher education especially enhancing strategic decision making, improved competitiveness, better resource allocation, enhanced student satisfaction and retention, increased collaborations and networking and proactive adaptation to market changes (Ezenwa, Stella & Agu, 2018; Mokhtar & Yusoff, 2019; Mina, Surugiu & Cristea, 2014; Palilingan & Batmetan, 2020; Khatibi, Keramati & Shirazi, 2020; Garcí-Alsina et al., 2011). However, the limited research on CI within Malaysia's higher education sector highlights a significant gap as most existing studies focus predominantly on business

and technology and only few studies from Asian region compared to the Western countries. (Garcia-Alsina et al., 2011; Garcia-Alsina et al., 2015).

1.12 PURPOSE OF THE STUDY

The study aims to give insights into CI and its significance in improving the organisational performance of institutions of higher learning, as intelligence-based decision-making is needed by all types of organisations (Bulger, 2016). The performance of the institutions of higher learning can be measured through graduate employability rate, improvement in research performance, quality of education, attracting high achiever international students, and improvement in world ranking (MoE, 2015). This study also contributed to the higher education literature.

The framework and constructs developed by Andrea Saayman, Jaco Pienaar, Patrick de Pelsmacker, Wilma Viviers, Ludo Cuyvers, Marie-Luce Muller & Marc Jegers (2008) and Calof and Dishman (2002) will be the foundation for this research. This study also aims to examine the impact of the CI on the organisational performance of higher learning institutions in Malaysia. Adopting and applying CI-based knowledge are considered vital for IHL in their quest to encounter globalisation and rapid technological changes.

1.13 RESEARCH OBJECTIVES

The objective of this proposal is to find out and improve on the understanding of competitive intelligence in institutions of higher learning (IHL) in Malaysia and its relationship towards improving the performance of Malaysian higher learning institutions. Moreover, this study intends to find out whether organisational factors specifically process & structure and awareness & culture plays a significant moderating role between competitive intelligence and organisational performance. The aim of this proposal is to incorporate variables from these disciplines to test a model of competitive intelligence. The following research objectives are identified as follows:

1. To investigate the extent of the Competitive Intelligence (CI) process in institutions of higher learning (IHL) in Malaysia.
2. To investigate the effect of Competitive Intelligence (CI) on the organisational performance of institutions of higher learning (IHL).
3. To examine the moderating effect of organisational factors on the relationship between Competitive Intelligence (CI) and organisational performance of institutions of higher learning (IHL) in Malaysia.

1.14 RESEARCH QUESTION

This research aims to gain insight on the CI process in Malaysian higher learning institutions and its relationship towards improving the performance of Malaysian higher learning institutions. The following research questions were formulated from the research objectives:

1. To what extent is the Competitive Intelligence (CI) process in the Institutions of Higher Learning (IHL) in Malaysia?
2. What is the effect of Competitive Intelligence (CI) on the organisational performance of Institutions of Higher Learning (IHL) in Malaysia?
3. Do organisational factors moderate the relationship between Competitive Intelligence (CI) and the organisational performance of Institutions of Higher Learning (IHL) in Malaysia?

1.15 THEORETICAL FRAMEWORK

The theoretical frameworks for this research are based on the resource-based view (Wernerfelt, 1984; Barney, 1991) with a specific focus on the knowledge-based theory (Kogut & Zander, 1992; Nonaka, 1994; Spender & Grant, 1996). The main elements in

the Resource-Based View (RBV) include the resources and capabilities that can leverage the organisation's competitive advantage (Grant, 1996). CI manifests the firm's resources and organisation capital through generating and utilising knowledge that could be useful in decision-making and subsequently achieving competitive advantage in the marketplace. Knowledge-Based View (KBV) can be regarded as a subset of RBV, where the firm is conceptualised as an institution for integrating knowledge (Grant, 1996).

According to Ghannay and Mamlouk (2012), knowledge is the most important and influential resource in the competitive business environment. Aggressive growth of information and data has made the ability to analyse and convert intelligence into knowledge to be the backbone for the organisation to gain a competitive advantage. CI provides a systematic process to get intelligence and support a culture of competitive awareness, making it a valuable and rare resource for the organisation.

This study uses the model developed by Saayman et al. (2008) and Calof and Dishman (2002), highlighting the important constructs for the generation of CI. This model also includes the strategic intelligence cycle theory (Montgomery & Weinberg, 1979).

1.16 OPERATIONAL DEFINITIONS

- i. Higher Education – Training courses, training, or preparation for research at the last level provided by universities or other educational institutions recognised as educational institutions of higher education by competent state authorities (Gubareva & Kovalenko, 2018). Courses or training provided by universities or other educational institutions recognised by authorities.
- ii. Higher Education Institutions – Composed of all public and private institutions accredited with the right to provide tertiary education level degrees (Kroese, 2016). Include all colleges, community colleges,

universities and universities recognised and accredited by the authorities providing certificates or degrees level.

- iii. Competitive Intelligence – Systematic and ethical programme for gathering, analysing, and managing external information that can affect the company's plans, decisions, and operations. Process or practice and disseminate actionable intelligence by ethically planning, collecting, analysing information about or from internal and external environments to decision makers.
- iv. Organisational Performance – It means the analysis comparison between the actual results with the targeted objectives of an organisation. This study refers to the ability of institutions of higher learning to perform consistently and remain viable in the industry.

1.17 SUMMARY OF CHAPTER

Investigating competitive intelligence is a continuing concern within the field of strategic management when it is link to performance. Competitive intelligence (CI) plays a crucial role in enhancing organisational performance by providing valuable, rare, inimitable and non-substitutable insights that inform strategic decision making. Determining the impact of CI on performance is important for the future of the higher learning institutions. The main contribution of this study would thus be to validate the significance of CI and organisational factors within the context of higher learning institutions. These relationships are especially relevant as such institutions strive to sustain a competitive advantage and enhance performance.

This particular PhD research was designed to determine the relationship between CI and organisational factors and their effects on organisational performance in the context of Malaysia. Most of previous studies had been conducted in Western countries (Garcia-Alsina et al., 2013). Testing these relationships in developing countries will likely give new insights into relationship of CI, organisational factors and the performance of institutions of higher learning.

To date, no study has investigated the relationship between CI and organisational performance of institutions of higher learning. In addition, this PhD research also tested the effects of organisational factors on the above-mentioned relationship. This moderating variables were suggested to be tested in the context of institutions of higher learning.



CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter offers a comprehensive analysis of the relationship between competitive intelligence and organisational factors, exploring how these constructs affect organisational performance. A review of relevant literature identified four constructs affecting competitive intelligence. Additionally, we delve into the importance of incorporating process, structure, awareness and culture as moderating variables in this study. The chapter then examines the association between competitive intelligence and organisational performance, concluding with a summary of the literature reviewed on competitive intelligence.

The literature review discusses the existing research on the resource-based view theory (RBV), knowledge-based view theory (KBV), and intelligence cycle theory. This chapter also includes the competitive intelligence (CI) constructs, organisational factors for implementing CI, and performance indicators of Institutions of Higher Learning (IHL) in Malaysia.

Competitive intelligence is a systematic approach for gathering, analysing and interpreting relevant information about competitors, market conditions and broader industry trends to guide strategic decision making (Fuld, 2002; Garcia-Alsina et al., 2016; Madueira et al., 2021; Maugwa & Laughton, 2023). It provides a comprehensive understanding of the competitive landscape, often utilising tool such as SWOT analysis to evaluate competitors' strengths, weaknesses, opportunities and threats (Porter, 1980).

Historically, CI focused on direct competitor data such as product offerings, pricing, marketing tactics and financial performance. However, with today's fast paced and globally connected market, CI has evolved to consider a wider range of factors including technological shifts, regulatory updates and emerging market dynamics (Hooley, Piercy, Nicoulaud, & Rudd, 2017). By examining these broader aspects, CI

empowers organisations to anticipate opportunities for innovation, differentiate their strategies and mitigate risks proactively. In essence, CI acts as a proactive strategy tool, enabling organisations to forecast market changes, respond to competitive pressures and make data informed decisions that foster sustainable growth and profitability (Fuld, 2010; Kim & Mauborgne, 2014; Porter, 1979)

In the 2024 National Budget, the higher education in Malaysia has been allocated RM 16.3 billion compared to previous year's RM15.3 billion. Additionally, private higher institutions continue to play a vital role in the economy contributing RM12.27 billions to the nation's gross domestic product (Department of Statistics Malaysia, 2023; Mushtak, 2024). CI is a crucial component of strategic planning (Mohd Asri & Abdul Mohsin, 2020). However, it was found that Malaysian institutions of higher learning lack solid, long term strategic planning, effective monitoring and control mechanisms and robust strategy implementation. Additionally, they face challenges such as a lack of awareness and understanding of CI concepts, insufficient resources, organisational culture of competitiveness, resistant to change and a lack of skilled personnel. These shortcomings have undermined their ability to sustain education quality and remain competitive in the expanded higher education system (Deni, Zainal & Malakolunthu, 2013; Du Toit & Sewdass, 2014; Ali, Ayodele & Ibrahim, 2019; Jayabalan, Dorasamy & Raman, 2021; Fadzil, Samad, Nawawi, Pandi & Puteh, 2022).

Malaysian firms moderately adopt competitive intelligence as a strategic business tool to identify opportunities, understand the market environment and monitor competitors. CI is a systematic process and the product of processed business information that provides actionable recommendations (Wahab & Othman, 2006) to help firms gain a competitive advantage and improve organisational performance (Asri & Samad, 2024; Yap, Rashid & Safuan, 2013; Yap & Rashid, 2011). However, it was found that Malaysian firms have yet to capitalise on formal CI units and continue to underutilise informal employee networks for information and knowledge sharing (Yap & Rashid, 2011; Alshammakh & Azmin, 2021). Additionally, they lack of advanced data analytics capabilities to interpret information effectively and a structured plan to enhance competitor tracking and overall competitiveness (Du Toit & Sewdass, 2014).

Overcoming these internal barriers is essential for an effective implementation of CI adoption. By identifying the specific factors that hinder CI adoption, IHL can develop targeted strategies to enhance their CI capabilities and achieve a competitive advantage and support more informed decision making.

2.2 RESOURCE-BASED VIEW (RBV)

Competitive intelligence is an internal organisational resource that can be leveraged to achieve competitive advantage and superior performance. This aligns with the Resource-Based View (RBV) which was initially conceptualised by Wernerfelt (1984). Wernerfelt (1984) defined resources as assets such as fixed assets, blueprints and cultures that a firm develops or acquires and could have significant consequences for a firm's competitive advantage and performance. Wernerfelt (1984) also suggested that strategic planning should move away from industry analysis and instead focus on identifying and leveraging firm specific resources and unique capabilities. This shift prioritises the unique capabilities and assets within the organisation as the foundation for creating a competitive advantage.

Barney (1991) expanded on this idea by asserting that firms can achieve long term competitive advantage by using their internal strengths to seize opportunities, counteract external threats and minimise internal weaknesses. Barney (1991) classified resources into three main categories: physical capital resources, human capital resources and organisational capital resources. Physical resources encompass the tangible assets a firm utilises and can be seen and quantified, such as financial, organisational, physical, technology, plants, equipment, geographic location and access to raw materials. Human capital resources refer to the skills and attributes of employees including their training, experience, judgement, intelligence, relationships and insights. Organisational capital resources include firm's formal reporting structure, formal and informal planning, controlling, coordinating systems as well as informal relations among groups within a firm and between a firm and those in its environment (Hill, Jones & Schilling, 2014; Hitt, Ireland & Hoskisson, 2009; Barney & Arkan, 2001; Barney, 1991).

Barney (1991) also included capabilities, organisational process, information and knowledge within the scope of organisational resources. However, a firm's organisational resources must satisfy the VRIN criteria- Valuable, Rare, Inimitable and Non-substitutable to achieve a sustainable competitive advantage that leads to long-term superior performance. Later, Barney (1995) refined this model by introducing the VRIO framework, which added Organisation as a critical component, emphasising that organisational resources must be properly structured and managed within the firm to unlock their full strategic potential and sustain competitive success. Key components of the organisation include a formal reporting structure, management control systems and compensation policies, all of which are essential for optimising resources utilisation and ensuring sustained success. RBV is closely linked to the competitive intelligence as it emphasises on system and people within the firm.

For a summary, the RBV is based on a framework of resources: physical, human and organisational. All resources must be heterogeneous, unique and immobile and fulfilling the VRIO attributes to provide organisational capabilities for strategy and sustained competitive advantage. Competitive intelligence offers a practical approach that can generate valuable intelligence and build systems that can become essential resources for the organisation. When combined with organisation's culture and operational dynamics that foster effective competitive intelligence, the organisation can create rare resources and capabilities that are difficult to replicate. While CI has the potential to create highly valuable resources, research linking CI to the concept of VRIO resources remains limited.

In this research and to due to its relevancy to the CI, human and organisational capital resources are included in the review of the literature. Competitive intelligence is a strategic operational function that equips organisations with actionable insights, shaping decisions that lead to long-term success. Competitive intelligence can be regarded both a resource and a capability within organisation. As a resource, it falls under the category of organisational resources, as it is often embedded in the organisation's operations through structured processes. These processes involve the systematic gathering, analysing, and dissemination of valuable information regarding competitors, markets and external environment which ultimately supports more informed decision making. CI is a formalised organisational process that helps

organisations navigate their competitive landscape (Wright, Eid & Fleischer, 2009; Dishman & Calof, 2008; Maungwa & Laughton, 2023; Calof & Wright, 2008; Liebowitz, 2006).

CI functions as a key organisational capability comprising a set of integrated set human skills, expertise, practices and systems. These elements work together to convert raw information into actionable intelligence (product), which enables organisations to effectively utilise intelligence and adapt to changing environment, anticipate and react to market disruptions proactively, develop a continuous, systematic ability to detect threats and opportunities and adapt intelligence in ways that provide a competitive edge, achieving strategic agility and make faster and more informed decisions (Tuan, 2022; Calof & Wright, 2008; Day & Shoemaker, 2006; Liebowitz, 2006).

In the context of competitive intelligence, there is an intelligence in both the acquisition of resources and leverage of capabilities. Competitive intelligence helps identify and assess the value of both resources and capabilities, enabling firms to strategically combine them for optimal growth and competitive advantage. The synergy between these assets is critical for organisational development as competitive intelligence provides insights that guide the effective acquisition, development and utilisation of resources and capabilities (Burvill et al., 2018). This combination is essential for fostering sustained organisational growth and maintaining a competitive edge in dynamic markets.

2.2.1 RBV and CI

The organisation's knowledge, human capital and CI processes are valuable resource that form the foundation for creating and sustaining competitive advantage (Mohd Asri & Abdul Mohsin, 2020; Sing & Tanwar, 2019; Ghannay & Zeinab, 2012; Taib, Yatin, Ahmad & Mansor, 2008). As a unique strategic resource, CI processes offer organisations valuable insights into market conditions, competitors, customer preferences and emerging threats or opportunities, thereby enhancing decision making and enriching the comprehension of information collection and evaluation (Mohd Asri & Abdul Mohsin, 2020). Superior CI processes help the organisations to detect subtle

market shifts, identifying emerging trends early and make strategic adjustments to both tangible and intangible resources. This enhances decision making and strategy formulation thereby securing a competitive edge.

Competitive intelligence with uniqueness and distinctive features is a key to creating and maintaining competitive advantage. When competitive intelligence possesses Valuable, Rare, Inimitable, and Non-substitutable (VRIN) attributes, it empowers organisations to orchestrate their resources more effectively, leading to sustainable competitive advantage. In the organisation, managers play a crucial role in leveraging competitive intelligence to select, develop, and combine both tangible and intangible resources, thereby enhancing firm's competitive capabilities (Leuschner, Rogers & Charvet, 2013; Sirmon, Hitt & Ireland, 2007). By integrating intelligence into decision making, managers ensure that resources that are deployed optimally enhancing organisational performance and long term competitiveness.

2.2.2 Dynamic Capabilities

Dynamic capabilities provide the flexibility and resilience organisations need to navigate changing environments. These capabilities enable organisations to reconfigure, create, extend, adapt, and modify their resource base and internal and external organisational skills to meet evolving demands. By leveraging CI insights, organisations can dynamically adapt their strategies, processes and functional to stay ahead in competitive markets (Teece et al., 1997; Helfat & Peteraf, 2003; Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece & Winter, 2007).

The ability to continuously adjust is critical for responding effectively to rapid market changes and aligning organisational resources with external changes (Nason & Wiklund, 2018; Teece, Pisano & Shuen, 1997). The effectiveness of dynamic capabilities is significantly influenced by the organisation's management team, as well as its managerial processes, procedures, systems, and structures (Teece, 2007). Thus, CI plays a vital role in supporting dynamic capabilities by providing actionable insights that guide decision making processes. This enables organisations to remain agile and competitive in dynamic environments.

The dynamic nature of resources contributes to sustainable competitive advantage. According to resource-based theory sustainable competitive advantage arises from executing strategies that effectively utilise a firm's internal strengths particularly those that are causally ambiguous, socially complex and based on intangible assets (Grant, 2016; Barney, 2001; Barney, 1991; Barney, 1986). CI contributes to this by providing actionable intelligence that helps firms capitalise on environmental opportunities, counteract external threats and align with organisational culture. Furthermore, CI enhances the firm's ability to identify and utilise resources that are durable and transferable while also addressing internal weaknesses. By guiding the strategic use of resources and capabilities, CI ensures organisations remain responsive to changing market environments and sustain long term competitive advantage.

Information could only be transformed into actionable intelligence through human involvement, structured organisational processes and systematic interpretation. The contribution of CI to the competitive advantage of the organisation depends on its valuability, rarity, and inimitability (Grant, 2016; Barney, 1991). Resources and capabilities form the foundation of a firm's strategy, guiding its formulation and driving the strategies that lead to profit generation (Grant, 2016; Grant, 1991).

2.3 KNOWLEDGE-BASED VIEW (KBV)

Knowledge is a distinctive and crucial resource within the organisation, essential for its long survival and success. Grant (1996) in developing the knowledge-based theory emphasised the central role of both human and organisational resources in shaping a firm's competitive advantage. According to Grant (1996), knowledge is a key organisational resource that assists the organisation in creating valuable, rare, inimitable, and non-substitutable (VRIN), all of which are essential attributes for establishing and sustaining a competitive advantage.

Human knowledge includes the expertise, skills and insights that individuals bring to the organisations while organisational knowledge refers to the collection know-how, processes and routines embedded within the organisation. This combination of human and organisational resources enables organisations to innovate,

make informed strategic decisions and adapt to changing market environments. When managed effectively, knowledge enhances internal capabilities and ensures that the organisation can respond to market dynamics faster and more efficiently than competitors (Grant, 1996).

Human interaction and socialisation activities in the organisation are key drivers in the creation and dissemination of knowledge. Knowledge, as a critical organisation's resources forms the basis of sustainable competitive advantage by enabling continuous innovation and adaptation to highly competitive and dynamic markets, especially in the in the era of information and knowledge (Grant, 1996; Shujahat, Hussain, Javid, Malik, Thurasamy & Ali, 2017; Calof & Sewdass, 2020). This competitive advantage is sustained when knowledge retains its value over time, is continuously reproduced, widely shared and applied across individuals and the organisation (Nonaka, Toyama & Hirata, 2008; Asghari, Targholi, Kazemi, Shahriyari & Rajabion, 2020).

KBV distinguishes between two main elements of knowledge: tacit (knowing how) and explicit (knowing about) (Grant, 1996). Tacit knowledge rooted in habits, routines and know-how is more difficult to codify and transfer but offers significant competitive advantage due to its inimitability (Grant, 1996). Explicit knowledge on the other hand is easier to transfer through documentation and verbal communication. Hakanson (2007) further expanded this categorisation by adding internalised knowledge (unused explicit knowledge) and procedural knowledge (skills and capabilities). Gorman (2002) classified knowledge into declarative (knowing what), procedural (knowing how), judgement (knowing when), and wisdom (knowing why).

2.3.1 Knowledge Creation

The creation of knowledge requires both individual and collective effort. While individual activity forms the foundation for knowledge creation but its integration into the organisation is mediated by knowledge sharing mechanisms and supportive culture (Grant, 2015; Grant, 1996; Stojanovic, Nielsen & Boskovic, 2019). Knowledge transfer which is crucial for building absorptive capacity depends on the ability of individuals and teams to integrate new knowledge with existing knowledge (Cohen & Levinthal,

1990). Cross-functional collaboration, decision making participation and social interaction enhance absorptive capacity at the team level (Jansen, 2005).

Organisational structure plays a pivotal role in knowledge creation and dissemination. A well-established hierarchical which fosters a sense of belonging and shared identity, facilitates knowledge sharing within the organisation (Grant, 2015; Grant, 1996). While explicit knowledge can be effectively transferred through structured system, tacit knowledge requires more formal and unstructured channels (Chen, Sun & MacQueen, 2010).

Specialised knowledge created by specialised individuals with unique expertise offers additional advantages to the organisation. However, to capitalise on this knowledge, organisation must establish systems that integrate these specialised knowledge bases effectively (Grant, 2002). This is particularly important as competitors can also generate new knowledge using standardised codes to transform tacit knowledge into explicit knowledge that are easier to imitate (Grant, 1996).

In terms of decision-making knowledge-based view suggests a differentiation between tacit knowledge differs and explicit knowledge. Decisions involving explicit, codifiable knowledge are best centralised whereas those requiring tacit and distinctive knowledge should be decentralised giving decision making authority to those who possesses the expertise (Grant, 1996; Grant, 2002; Grant, 2013). Greater autonomy in decision-making enhances knowledge creation by allowing individuals to express their innovative and creative ideas (Stojanovic et al., 2019). The KBV emphasises the role of both organisational structure and individual in sustaining competitive advantage through knowledge.

2.3.2 KBV and CI

CI significantly contributes to KBV by serving as a valuable resources for firms through the creation and utilisation of knowledge (Freyn, 2017; Madureira, Popovic & Castelli, 2023). Raw data is transformed into strategic knowledge which is essential for firms to innovate, adapt and sustain a competitive advantage. These insights are difficult for

competitors to replicate due to the distinctive ways in which information is collected, interpreted and applied within the organisational context. According to Hannula & Pirttimaki (2003), actionable intelligence enables firms to achieve superior performance. Furthermore, intelligence and knowledge are pivotal to a firm's success, survival, and growth (Hakanson, 2010). Hence, by adopting a comprehensive CI model, organisations can generate intelligence that fosters sustainable competitive advantage (Grant, 2015).

The process and activities of competitive intelligence in the organisation filter and transform raw information into actionable intelligence. Rapid technological advances have led to an enormous amount of data and information being publicly available (Hakanson, 2010). CI must ensure that actionable intelligence generated aligns with VRIN characteristics to gain a sustainable competitive advantage (Barney, 1991). Both theories provide the theoretical basis for demonstrating the value of resources that CI can offer.

2.4 DEFINITION OF COMPETITIVE INTELLIGENCE (CI)

There is no standardisation in defining CI. The most comprehensive definition of CI was formulated by Pellisier & Nenzhelele (2013), who defined CI as a process or practice that produces and disseminates actionable intelligence by planning, ethically and legally collecting, processing, and analysing information from and about the internal and external or competitive environment to help decision-makers in decision making and to provide a competitive advantage to the enterprise. Table 2.1 summarises some definitions used by researchers (Table 2.1 summarizes definitions of CI focusing on managerial and tactical aspects).

CI is always misunderstood as environmental scanning. CI differs from environmental scanning as the former involves acquiring internal and external information while the latter, which is a subset of CI, only gathers external information and knowledge that would assist top management in planning for their future course of action (Aguilar, 1967; Choo, 1993; Koseoglu, Ross & Okumus, 2016). Environmental scanning, competitor intelligence, and market intelligence focus on tactical level

purposes, while CI and business intelligence focus on both strategic and tactical level purposes (Koseoglu et al., 2016). CI is not only considered a process or activity but also a product that supports decision-making in strategic planning (Bose, 2008). All CI activities, such as market research, competitor analysis, business intelligence, and environmental scanning, may happen at the operational, tactical, and strategic levels (Koseoglu et al., 2016).

CI provides clear steps for the organisation to manage internal and external information. CI acts as a research, development, and innovation framework for organisations to improve their competitiveness using the high-value data and information in the processes, products, and services and assist in maintaining or developing a competitive advantage (Prescott & Gibbons, 1993). It can be done by collecting and analysing external data and information that subsequently improves decision-making (Calof, Arcos & Sewdass, 2018; Gilad, 1989). Table 2.1 summarises CI definitions.

Table 2.1 Summary of CI Definitions

AUTHOR	DEFINITION	APPROACH
Prescott & Smith (1989)	Assist the management in collecting, integrating, analysing, interpreting, and disseminating information about industries and competitors.	Managerial
Herring (1992)	CI will describe the nature of the competitive environment, predict the future competitive environment, challenge underlying assumptions, ask the right questions, determine and overcome weaknesses, implement and fine-tune the strategy, and determine when the existing strategy is not practicable.	Managerial

AUTHOR	DEFINITION	APPROACH
Prescott & Gibbons (1993)	CI is also important as an expansion tool. Expansion is not easy. If the companies want to expand their business at the international level	Managerial
Prescott & Gibbons (1993)	Formalised yet continuously evolving process by which the management team assesses the evolution of its industry and the capabilities and behaviour of its current and potential competitors to assist in maintaining or developing a competitive advantage.	Managerial
Bernhardt (1994)	In a very competitive market, for instance, companies have to minimise mistakes and losses, and failure to take proactive action will be detrimental to the success of the companies in the future.	Managerial
Kahaner (1996)	CI is an essential instrument. It empowers senior managers to boost their competitiveness. The use of CI in identifying key influential forces and forecasting future market direction.	Managerial
Montgomery & Weinberg (1998)	Signal for early warnings of opportunities and threats, assess and track competitors' movements, and also advise on the effective implementation to the top management.	Managerial
Society of Competitive Intelligence Professionals (SCIP, 2009)	Systematic and ethical programme for gathering, analysing, and managing external information that can affect the company's plans, decisions, and operation	Technical
Nasri & Zarai (2013)	CI serves as an ethical and systematic process. It also provides a programme and function for gathering data and information.	Technical

AUTHOR	DEFINITION	APPROACH
Pellissier & Nenzhelele (2013)	A process or practice that produces and disseminates actionable intelligence by planning, ethically, and legally collecting, processing, and analysing information from and about the internal and external or competitive environment to help decision-makers in decision-making and provide a competitive advantage to the enterprise.	Technical
Madureira, Popovic & Castelli (2021)	CI is the process and forward-looking practices used in producing knowledge about the competitive environment to improve organizational performance.	Technical

2.5 ADVANTAGES OF COMPETITIVE INTELLIGENCE (CI) IN ORGANISATION

CI operates as a systematic process and a fundamental instrument, offering structured methods for gathering, analysing and managing information about the external environment. It enables organisations to further analysing and managing information about the external environment, identify key influential forces and forecast future market directions and competitive dynamics (Herring, 1992; Kahaner, 1996 Nasri & Zarai, 2013; Madureira, Popovic & Castelli, 2021). Additionally, CI supports international expansion by serving as a tool to evaluate global opportunities and navigate competitive landscapes (Prescott & Gibbons, 1993).

CI acts as a critical tool to assess the external environment, enabling organisations to anticipate changes, address challenges and refine strategies effectively. It allows the organisation to describe the nature of the competitive environment, predict the future trends, challenge underlying assumptions by asking the right questions. CI also helps organisations identify weaknesses, implement and fine-tune strategies and,

decide when the existing strategies are no longer practicable (Herring, 1992; Tanascovician & Hagi, 2013; Bartes, 2015; Calof, Richard & Smith, 2015). Additionally, CI signals early warnings of opportunities and threats, assessing and tracking competitors' movements and also give advice on the practical implementation to the top management for strategic decision making (Nasri, 2011; Montgomery & Weinberg, 1998).

CI contributes significantly to organisational change and the establishment of sustainable competitive advantage. It influences organisational learning and becoming the construct for organisational change (Pole, Madsen, Dishman, 2000), formulating corporate strategy, establishing the mechanism to identify competitors' next course (Cappel & Boone, 1995), and creating sustainable competitive advantage of organisation through rigorous systematic and formal analysis (Dishman & Calof, 2008; Dishman & Calof, 2008; Strauss & du Toit, 2010).

The success of CI depends on employees understanding of organisational strategies and their commitment to confidentiality. The effectiveness of CI depends on employees being aligned with organisational strategies and maintaining confidentiality (Koseoglu (2018: Parnell, 2003). Formalising CI improves operations and performance while failing to act proactively poses risks to long term success (Bernhardt, 1994; Shujahat, Hussain, Javed, Malik, Thurasamy & Ali, 2017). Therefore, fostering employees awareness and maintaining confidentiality are critical components for maximising the benefits of CI within an organisation.

CI can be generated through the analysis obtained from various sources of information. There are many ways for an organisation to collect CI, either primary or secondary. Annual reports, magazines, electronic surveillance, satellite photography, and websites could be considered secondary sources, while primary sources include competitors, suppliers, customers, etc. (Nasri, 2012). The transformation of raw information into actionable intelligence occurs through a process of analysis, filtering and distillation, and managers used this intelligence effectively for decision-making (Madureira et al., 2021; Kahaner, 1996).

The effectiveness of CI practices within an organisation is influenced by both firm level and individual/team attitudes which shape the scope and impact of CI on organisational performance. CI practices in the organisation could be classified into firm attitude and also individual/team attitude. Firm attitude refers to immune attitude, task-driven attitude, operational attitude, strategic attitude (Wright, Pickton & Callow, 2002), defensive, passive, and offensive (Montgomery & Weinberg, 1979), tactical or strategic (Cobarsi-Morales, 2016), while individual/team attitude refers to war attitude, assault attitude, active attitude, reactive attitude and sleepers' attitude (Rouach & Santi, 2001). The impact of these attitudes determines the extensiveness of CI practices in the organisation and performance.

CI practices have been discovered in several sectors, such as retail banking, furniture retail, healthcare, professional sports, higher education, the pharmaceutical industry, and developed and developing countries (Koseoglu, Ross & Akumus, 2016). Table 2.2 summarises CI in small & medium enterprises (SMEs) and multinational companies in 21 countries.

Table 2.2 CI in Small & Medium Enterprises and Multinational Companies in 21 Countries.

Germany	Small companies	Michaeli, 2004
Australia	Retail/wholesale, Construction, transportation, finance, business services, manufacturing Pharmaceutical and IT firms	Hall & Bensoussan, 1997 Bensoussan & Densham, 2004
Canada	Multimedia firms & nightclubs Technology firms	Tarraf & Molz, 2006 Dishman & Calof, 2008

Germany	Small companies	Michaeli, 2004
India	Public and private industries (consumer products, chemical and plastic, software consulting, pharmaceuticals, finance/banking, computers and retailing)	Adidam et al., 2012
Portugal	Manufacturing, construction, energy, distribution, tourism, transport and service Portuguese organisation	Franco et al., 2011 Joao, 2017
New Zealand	SMEs	Hawkins, 2004
Singapore	SME & Multinational firms	Wee & Leow, 1994
China	Consulting firms Higher education	Bao et al., 1998; Tao & Tao & Prescott, 2000 Liu & Oppenheim, 2006
South Africa	Exporting companies, manufacturing, service companies, primary sectors Retail banking	Viviers et al., 2005 Heppes & du Toit, 2009
Belgium	Exporting companies	De Pelsmacker et al., 2005
Turkey	SME (manufacturing/ industrial & service) Hotels SME (manufacturing & service)	Koseoglu et al., 2011 Koseoglu et al., 2016 Wright et al., 2013
Tunisia	Communication technologies, manufacturing, and commercial retailing	Nasri, 2011

Germany	Small companies	Michaeli, 2004
Russia	Information and Communications Technologies (ICT), paper and forest, metal and manufacturing, energy, food and beverages, retail, pharmaceuticals, and financial services Pharmaceutical industry	Flint, 2002 Aspinall, 2011
Spain	Higher education	Garcia-Alsina et al., 2015
China	Higher education	Liu & Oppenheim, 2006
Finland	Finnish firms (Information and communication technologies, paper and forest, metal and manufacturing, energy, food and beverages, retail, pharmaceuticals, and financial services)	Hirvensalo, 2004
European	Pharmaceutical industry	Badr et al., 2006
Lithuania		Stankeviciute et al., 2004
Latin America		Price, 2000
Latvia	Latvian companies	Andrejs Cekuls, 2015

CI is a strategic and structured approach that leverages intelligent information and business analytics to support competitive decision making and drive organisational success. CI is a strategic process and structured process that encompasses gathering, analysing and distributing intelligent information through business analyticals and supporting decision makers in crafting competitive strategies. Its holistic approach enhances organisational competitiveness, benefits organisations and industry alike and driving competitive advantage (Madureira et al., 2021; Johns & Van Doren, 2010; Lemos & Porto, 1998).

CI is a systematic and ethical process for collecting, analysing and disseminating publicly available information to produce actionable insights for corporate strategy and

decision making. Research highlights its critical role in ensuring organisational success and positioning CI as a key initial step in defining strategic direction within rapidly changing market. Failing to adopt proactive CI measures may jeopardise an organisation's survival.

2.6 IMPORTANCE OF CI IN INSTITUTIONS OF HIGHER LEARNING

Competitive intelligence is more than a mere tool. It serves as a strategic assets in higher education. Rombert, Borges, Quoniam, and Luiz (2007) emphasised the important of CI in improving decision making in higher education, highlighting its role as a strategic instrument. Its effectiveness is reinforced through applications in strategic planning (Cronin, 2006; Garcia-Alsina et al., 2011) where CI enables institutions to align their goals with environmental insights. Furthermore, CI facilitates environmental scanning and forecasting to support long-range decision-making (Morrison and Mecca, 1988). Social capital plays a critical role in enhancing CI by fostering collaboration and knowledge sharing within academic institutions (Ortoll, Lopez-Borrull, Canals., Canals, Garcia-Alsina and Cobarsi-Morales, 2010).

In today's rapidly evolving educational landscape, institutions of higher learning must proactively monitor their external environment. Globalisation, politicisation, multiculturalism, and advancement in internet technology continue to reshape the traditional models of teaching, learning, and research (Innayatullah & Gidley, 2000). Intensifying CI practices is essential for institutions of higher learning to successfully navigate the highly competitive educational landscape and address uncertainties in identifying their niche markets and sustain relevance (Elenkov, 1997; El Mabrouki, 2007; Cobarsi-Morales et al., 2016).

Addressing the economic pressure facing higher education requires strategic transformation. Universities are now compelled to generate revenue beyond traditional funding sources, necessitating a shift toward entrepreneurial approach. Strengthening CI capabilities helps universities enhance academic reputation and quality, adapt to global market dynamics and revamping bureaucratic structures to operate more efficiently as business entities (Hughes & White, 2005; Barrett, 2010). Amidst budget

cuts and financial constraints, CI aids universities worldwide in navigating uncertainties and sustaining their operations (Ahmad, Farley, & Naidoo, 2012).

Institutions with a corporate culture are better equipped to address and adapt to environmental changes. The transformation towards an entrepreneurial university must consider economic development in addition to research and teaching (Readings, 1996; Balasubramanian et.al, 2020). Now, universities must be responsive to economic pressure due to globalisation in the same way as large corporations requiring them develop multidimensional strategic objectives, hierarchical structure, and multidivisional organisational structure that are responsive to environmental changes (Bartlett & Ghoshal, 1993; Bartlett & Ghoshal, 1992; Bartlett & Ghoshal, 1990).

Businesses have long recognised the value of CI and integrated it into their operations to achieve strategic goals. For large corporation, CI serves as a critical tool to maximise profit, minimise cost and ensure business survival (Readings, 1996). It aids in tracking both direct and indirect competitors (Rouach & Santi, 2001), driving sustainable growth (Stefanikova, Rypakova & Moravcikova, 2015) and enhancing economic and financial performance (Fahey, 2007; Adidam, Banerjee & Shukla, 2012). This proactive adoption of CI highlights its role in fostering competitiveness and supporting long term organisational success.

Institutions of higher learning must prioritise well-coordinated intraorganisational and interorganisational efforts to remain competitive and sustainable in an increasingly dynamic global environment. It is essential for IHL to establish robust mechanism for effective strategy execution while reorganising structures and procedures to adapt to global changes in (Martinez & Jarillo, 1989; Hazelkorn, 2015). IHL should focus aggressively on strengthening their competitive advantage by leveraging national strengths, continuously minimising transaction and coordination costs, and forming strategic alliances with external stakeholders. These measures are crucial for ensuring their long term sustainability and market viability (Dunning, 1995; Dunning 2015).

CI activities, which are a critical element in the formulation of strategic planning and could assist the universities to conduct well-informed assessment of their external

environments. By utilising CI, university departments can gain valuable insights into competitive assessment techniques relevant to their operations. As such, strengthening CI practices and fostering a culture of competitiveness among staff is essential for institutions of higher learning (IHL). These practices not only enhance awareness of the competitive landscape but also ensure that staff remain informed and responsive to external changes. This heightened awareness significantly improves decision making process and the execution of strategies, positioning IHL to adapt and thrive in an increasingly competitive and dynamic educational environment.

2.7 COMPETITIVE INTELLIGENCE (CI) PROCESS CONSTRUCTS

Identifying essential CI constructs is crucial for organisations aiming to successfully adopt and implement CI. These constructs play a significant role in shaping the organisation's performance making their identification a necessary step in the CI process (Freyn, 2017; Hanif, Arshed & Farid, 2022). The strategic intelligence cycle theory, coined by Montgomery & Weinberg (1979), involves four key stages: directing, collecting, analysing, and disseminating information. This structured and formal process addresses challenges such as time constraints, limited human resources, and budgetary constraints (Nenzhelele & Pellissier, 2014). Moreover, the strategic intelligence cycle is indispensable for managing demanding tasks in the complex business environment, ensuring that organisations respond effectively to external dynamics (Bartes, 2013).

Intelligence can only be effectively produced through a well-developed and established CI process. Establishing a robust CI process is crucial for providing clear direction ensuring the valuable generation of intelligence and creating a sustainable competitive advantage (Rouach & Santi, 2001). CI is a comprehensive, iterative process that is not confined to a single stage (Kahaner, 1996), as the output of one stage seamlessly becomes the input for the next (Pellissier & Nenzhelele, 2013). The information received and interpreted through this process is instrumental in shaping both the organisation's short-term and long-term planning (Kahaner, 1996).

The CI process follows a systematic cycle of well-defined phases that ensure the generation of high-quality intelligence. These phases include planning and focus, collection, analysis, and communication are widely recognised in intelligence disciplines (Madureira, Popovic & Castelli, 202; Dishman & Calof, 2008; Saayman et al., 2008). These stages provide a structured framework for gathering and disseminating critical intelligence that supports decision making processes. Building on this foundation, scholars such as Maungwa & Laughton (2023), Wright & Calof (2006) and Prescott & Smith (1989) had further extended the traditional competitive intelligence (CI) framework by emphasising the significance of integrating decision makers and incorporating evaluation or feedback into the process. However, as Pellissier & Nenzhelele, (2013) argued that decision making and evaluation or feedback are not confined to the final stages but instead occur continuously throughout the CI cycle.

Uncertainties can be minimised through the regular execution of CI process within an organisation. CI facilitates the systematic collection of information, supporting informed decision-making within both formal and informal structure (Pirtilia, 199). In a competitive environment organisations must maintain a frequent, continuous, and evolving CI process. This ongoing process not only generates valuable insights but also serves as a source of ideas and innovation for strategic and operational decisions, the creation of valuable resources and the development of sustainable competitive advantage (Pirtilia, 1998; Calof & Wright, 2008; Freyn & Farley, 2020).

In this study, the instruments developed by Saayman et al., (2008), Calof & Dishman (2002), and Viviers & Saayman (2002) will be used to examine the constructs and contextual factors of CI, drawing upon earlier research by Sawka, Frances & Herrin (1995), Calof & Breakspear (1999) and Freyn (2017). These studies identified key constructs in the CI process including planning and focus, collection, analysis, and communication while also emphasising the role of contextual factors of the firm, such as process and structures, awareness, and culture CI effectiveness.

To gain deeper understanding of how CI impacts the performance of institutions of higher learning, this study will apply instruments by Saayman et al. (2008) and Calof & Dishman (2002) to gain insights into the impact of CI on the performance of institutions of higher learning. Additionally, instruments developed by Abu Bakar et al.

(2018) and Hernandez, Polanco & Escobar (2020) will also be used to study the organisational performance, enabling a thorough analysis of how CI processes affect institutional outcomes.

2.7.1 Planning and Focus

Planning and focus are the foundational stages of the CI process that involve the precise identification and definition of information requirements critical to management or decision making. This step demands active collaboration within the organisation to define relevant intelligence needs, identify current or emerging problems and ensure alignment with strategic objectives. Frequent discussion among stakeholders help refine these needs, fostering a dynamic, iterative process that evolves with the competitive landscape. (Gilad & Gilad, 1985; Carroll Mohn, 1989; Herring, 1998; Saayman et al., 2008; Wright, Bisson & Duffy, 2012).

CI supports strategic decision-making by identifying and prioritising information critical to organisational goals. Krizan (1999) introduced the concept of “Key Intelligence Topics” (KITs) which categorise and translate intelligence needed by decision-makers and are very significant to strategic intelligence requirements. KITs drive the direction and purpose of the CI operations, critical success factors in the CI world, and deliver forward-looking actionable intelligence that drive decision making and enhance competitive positioning (Carroll Mohn, 1989; Herring, 1999; Saayman et al., 2008). Furthermore, KITs are dynamic, evolving with the changing needs of the organisation and its environment, ensuring that CI operations remain aligned with strategic priorities.

Essential management needs can be effectively identified through direct, personal interactions between CI practitioners and senior leadership where dialogue fosters a deeper understanding of the organisation’s strategic priorities (Smith & Prescott, 1987; Bose, 2008). The formulation of Key Intelligence Topics (KITs) emerges from these proactive and responsive conversations, ensuring that the intelligence collection efforts align with management dynamics requirements (Herrings, 1999). KITs should address three core functional categories such as strategic

and tactical decisions and actions, early warning topics, descriptions of the key players and market segmentation which helped guide decision making, anticipate risks and identify key stakeholders influencing organisational success (Ettorre, 1995; Herrings, 1999; Maungwa & Laughton (2023). This approach ensures that CI process remains relevant and aligned with both immediate and long term organisational goals.

It is crucial for organisations to encourage participation from all employees in the CI process for the success of internal intelligence networks. Every individual within the organisation can act as a valuable intelligence agent (Carr, 1988; Prescott & Smith, 1989), and embedding a CI perspective into employees' job descriptions can streamline the management and execution of CI activities (Koseoglu et al., 2016). Organisations must also establish a robust human source network, as the most effective intelligence is often derived from direct human interaction, ensuring timely and actionable insights (Marceau & Sawka, 1999). Furthermore, creating structured systems for capturing and sharing this intelligence such as through employee feedback channels or incentivised contributions can further enhance the organisation's competitive advantage.

The specification of relevant and focused information is crucial for the success of CI in providing timely and actionable intelligence to the decision-makers thereby facilitating the formulation of best-fit strategies and improving organisational performance. Organisations should focus on continuously monitoring a wide range of external factors including competitors, market trends, customers preferences, international, economic shifts, technological advancement, suppliers dynamics, regulatory changes and socio-cultural influences (Montgomery & Weinberg, 1979; Barbar & Rai, 1993; Tao & Prescott, 2000; Rouach & Santi, 2001; Saayman et al., 2008; Bulger 2016). Additionally, CI also should cover the present and future behaviours of competitors, suppliers and customers as well as the threats and opportunities posed by technological innovations, acquisitions, market changes, products and services, and the general business environment. By maintaining a proactive focus on these areas, organisations can improve their performance and better respond to the evolving marketplace (Vedder, Vanecek, Guynes & Cappel, 1999; Reza et al., 2016).

Competitor focus is a critical component for organisational success as it directly affects market positioning and long term viability. By developing a deep understanding

of competitors and anticipating potential future scenarios, organisations can craft proactive strategies that align with emerging market dynamics (Taylor, 1992; Ellis, 1993; Koseoglu et al., 2016). To remain competitive, organisations must internalise continuous monitoring of both competitors and the broader business environment into their management practice, ensuring they are responsive to shifts in market conditions, customer needs and technological (Barbar & Rai, 1993). Through this proactive approach, organisations can not only survive but thrive in an increasingly competitive market.

An organisation should produce a regular competitor assessment reports ideally on a quarterly or bi-annually basis which provide a comprehensive analysis of the competitor's strengths, weaknesses, strategic goals and potential responses to market shifts. These reports should also competitive performance and potential future actions offering actionable insights for decision makers (Carr, 1988; Porter, 1985). Additionally, organisation must be vigilant about threat posed by indirect competitors which not directly competing in the same market but may disrupt the business environment (Carr, 1988). By regularly updating and adapting these reports, organisations can better anticipate competitive challenges and strategically position themselves in the marketplace.

2.7.2 Data Collection/Gathering

The collection of information should cover the most important information needed by the management. An organisation must consider both the tangible and intangible resources of its competitors that contribute to their market dominance. Their competitive advantage potential comes from their intangible resources such as management style, philosophies, conceptualisation, consumer relatedness, innovation, corporate culture, and commitment (Babbar & Rai, 1993).

Information can be obtained from both primary or secondary sources. Everyone within an organisation should be regularly exposed to information about its competitors and act as an agents in acquiring intelligence on the organisation's behalf (Smith & Prescott, 1987; Gibbons & Prescott, 1992). Additionally, an organisation should also

value insights from external individuals knowledgeable about clients as this broader perspective helps to avoid blind spots (Bille, 1992; Nelke, 2012).

CI could also be derived from information collected from trade shows, exhibitions, or conferences. These events offer valuable opportunities for networking, benchmarking and understanding industry trends. However, an organisation needs to educate or train their personnel to creatively and ethically seek essential information, particularly information not readily available to the public (Cook & Cook, 2000). Proper training and skill development would equip those involved in the intelligence process to collect information more productively and efficiently while adhering to ethical standards (Carr, 1988; Prescott & Smith, 1989).

Validated and reliable information forms the foundation for accurate data that can be transformed into actionable intelligence. Ensuring the reliability and validity of information sources enables organisations to identify abnormalities, maintain high information quality (Calof & Skinner, 1999; Nenzhelele, 2015). An organisation must verify information obtained from published or secondary sources with primary or field research, as the latter provides more timely and relevant insights (Cook & Cook, 2000). This verification process not only strengthens decision making by reducing risks associated with unreliable data but can also be supported by advanced technologies such as data analytics tools which efficiently validate information and identify inconsistencies (Madureira et al., 2023).

The collection of information must strictly adhere to ethical and legal guidelines. Organisations can gather data from publicly accessible sources such as newspapers, databases, annual reports, market analysis reports, financial and social media/website/internet, as well as specialised sources like exhibitions or trade shows and professional publications (Rouach & Santi, 2001; Vella & McGonagle, 1988; Calof et al., 2018). They can also leverage internal knowledge assets by involving managers and staff from key departments including engineering, finance, human resources, manufacturing, marketing, research and development, and sales (Bernhardt, 1994).

2.7.3 Data Analysis

Information could only be transformed into intelligence after thorough analysis. Krizan (1999) confirms that while automated CI tools help analysts to discern a large data collection efficiently, a non-automated techniques remain essential for generating valuable intelligence. Tools such as BCG growth-share matrix, financial ratios, and value chain analysis can assist in analysing data, converting it into intelligence (Fleisher & Bensoussan, 2003), and uncovering hidden knowledge (Trim, 2004). Furthermore, CI analyses opportunities and threats posed by emerging technologies, keeping IT management informed and enabling the development, implementation, or revision of budgets and strategic plans (Vedder, Vanecek, Guynes & Cappel, 1999).

CI practitioners can leverage technology, competitors information, and internal organisational information for analysis. Data mining, text mining, web mining, and visualisation technologies enable the classification, association, sequencing, clustering, and forecasting of data and ultimately transforming it into actionable intelligence (Cook & Cook, 2000; Bose, 2008). Prescott and Bhardwaj (1995) elaborate on various data analysis techniques such as competitor profiling, rivals' companies' key decision makers' personality profiles, core competence analysis, value chain analysis, management profiling, and assumption analysis. Additionally, tools like SWOT analysis, PESTEL, and Porter's Five Forces can be used to assess the external environment. This actionable intelligence is essential for making both strategic and tactical decisions (Gilad & Gilad, 1985, 1986; Kahaner, 1997; Calof & Miller, 1997; Herring, 1998).

Intensive analysis of information leads to high quality intelligence. This analysis involves systematically diagnosing relevant data, information, knowledge, and future technology forecasts and transforming them into actionable intelligence (Asghari et al., 2020; Miller, 2001). Organisations should develop data warehouses containing detailed or specific information along with Online Analytical Processing (OLAP). These data sources can then be transformed into actionable intelligence which is crucial for strategic planning, decision-making, and the development of strategies to achieve a sustainable competitive advantage (Cook & Cook, 2000; Miller, 2001; Asghari et al., 2020).

2.7.4 Communication

Useful intelligence should reach the targeted audience through a myriad of channels. This can meetings, forums, regular bulletins, scenario planning, and newsletters which enable decision-makers to take appropriate actions. It is essential that intelligence reaches the right individuals because strategic decisions cannot be made if the relevant decision maker does not receive the necessary intelligence (Viviers et al., 2002). Establishing web-based technologies such as Management Information Systems, Competitive Intelligence Information Resources (IICR), and Knowledge Management Systems can also aid in disseminating intelligence (Marin and Poulter, 2004).

The timeliness, relevance and accessibility of intelligence significantly affect the effectiveness of communication of information to management. Timely and relevant intelligence enhances competitiveness and every manager's role involves gathering and using intelligence (Marin and Poulter, 2004). However, the quality of the intelligence also depends heavily on the ability of individuals to identify and define the types of data required (Casarotto, Malafaia, Martinez & Binotto, 2021). Therefore, all employees should be granted access to competitive intelligence, especially data about competitors, through internal databases (Hohhof, 2000).

Effective communication of intelligence requires precision and clarity. CI reports are most valuable when they are available and accessible to management at the right time and tailored to their decision-making style. Additionally, the responsiveness of CI staff to the managers' time frames can significantly impacts the success of the CI communication (Carroll Mohn, 1989). Reports should combine both graphical and tabular output presented either in hard copy or via a computer terminals. To ensure clarity, reports should avoid information overload and redundancy to ensure that management can easily understand the actual situation and responds accordingly.

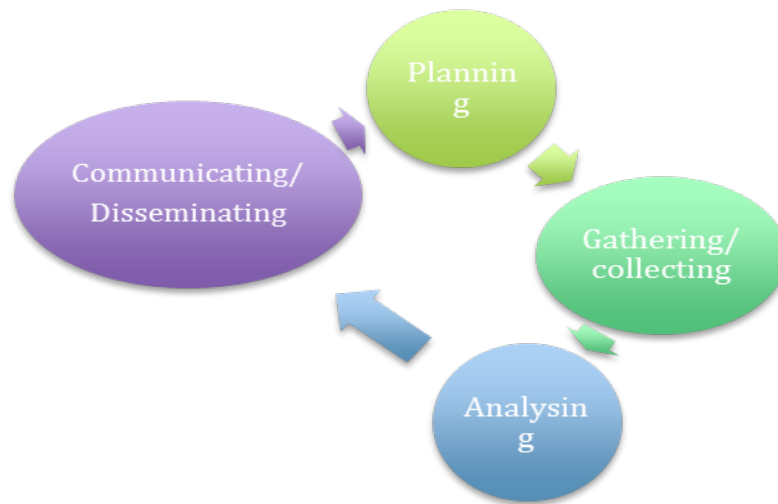


Figure 2.1 Competitive Intelligence Process

Based on the discussion, the research formulated hypotheses that aligned with research questions and research objectives. For the first research objective, that is to investigate the extent of the Competitive Intelligence (CI) process/practice in Institutions of Higher Learning (IHL) in Malaysia, the research question is “ What is the extent of the implementation of Competitive Intelligence (CI) processes and practices in Institutions of Higher Learning (IHL) in Malaysia?” The research objective and research question are aligned with the the first hypothesis “The Competitive Intelligence (CI) process or practice in Institutions of Higher Learning (IHL) in Malaysia consists of four stages: (1) Planning & focus, (2) Collection, (3) Analysis, and (4) Communication.”

The second research objective aims to investigate the impact of Competitive Intelligence (CI) on the organizational performance of Institutions of Higher Learning (IHL). This objective is guided by the research question: “What is the impact of Competitive Intelligence (CI) on the organizational performance of IHLs?” Based on this research question, the hypothesis is that Competitive Intelligence (CI) will have a significant impact on the organizational performance of IHLs (H2). This study seeks to explore how CI practices influence the effectiveness, decision-making, and overall performance of these institutions.

CI is not only a product but also a practice and process that plays an important role in creating new knowledge for the organisation's competitive advantage. Failure to

generate a sustainable competitive advantage would be fatal for the organisation to achieve sustainable performance, especially in a world of uncertainty. Knowledge could only be created and used for decision-making after completing the entire CI cycle. This process requires human intervention, critical thinking skills, and experience to successfully transform raw information into actionable intelligence.

2.8 ORGANISATIONAL FACTORS OF THE FIRM THAT HAVE A MODERATING EFFECT ON COMPETITIVE INTELLIGENCE

CI can not be effectively performed without strong support from the organisation. Organisational resources must fulfill the VRIN (valuable, rare, inimitable and non substitutable) attributes to gain a competitive advantage. These resources include a firm's formal reporting structure, formal and informal planning, controlling and coordinating systems, organisational culture, reputation, and the informal relations among groups within a firm and between a firm and those in its environment (Barney & Hesterly, 2010).

The organisational factors identified by Marceau & Sawka (1999), Calof & Dishman (2002), Viviers, Saayman & Muller (2005), Saayman et al. (2008), Pellissier & Nenzhelele (2013) and Mohd Asri & Abdul Mohsin (2020) highlight the critical elements such as process, structure, awareness and culture which significantly impact the effectiveness of CI. These factors help in establishing clear responsibilities and enhance calculability, predictability and coordination of CI activities within organisations.

2.8.1 Process/ Structure

The true potential of CI can only be realised through a well-established and coordinated process and structure supported by appropriate policies, procedures, and both formal and informal infrastructures. CI can be considered a failure if it is conducted illegally and unethically (Kahaner, 1996; Cook & Cook, 2000; McGonagle & Vella, 2012). CI

should be formally structured, systematic and integrated as an ongoing activity within the organization (Cox & Goodwin, 1967; Cleland & King, 1975; Porter, 1980; Gilad & Gilad, 1986; Ghoshal & Kim, 1986; Marceau & Sawka, 1999). Moreover, aligning CI with appropriate organisational structure, processes and strategies can further improve organizational performance (Babbar & Rai, 1993; Tsitoura & Stephens, 2012).

A formal structure contributes significantly to the success of CI by ensuring dedicated and motivated individuals to manage the process. It facilitates the regular monitoring of information sources, producing timely and specific needed insights and gathering the valuable competitive knowledge (Montgomery & Weinberg, 1979; Choudhury & Sampler, 1994; Dishman & Calof, 2008; Cobarsi-Morales et al., 2016). A combination of monetary and non monetary incentives can effectively motivate employees to collect and transmit data, as well as produce and disseminate high quality CI (Gilad, 1986; Barbar & Rai, 1993; Nenzhelele, 2015).

Establishing a centralised or decentralised CI function reflects the manifestation of formal and informal structures. Organisations may also adopt a hybrid approach by combining both functions provided that it aligns with their objectives. Centralised CI functions can be located at the corporate level while decentralised functions operate within strategic business units. Regardless of the structure there should be a well-network of collectors and technical experts (Gilad, 1986; Car, 1988). In addition, intranet and web-based technologies will encourage employees to create and share interesting observations, rumours and intelligence about the industry and competitors. The full potential of these technologies can only be realised when all employees actively involve in sharing information (Cook & Cook, 2000; Marin and Poulter, 2004).

CI continuously generates valuable foresight for strategic management and plays an essential role in strategy formulation. Ideally, CI should be positioned within strategic planning or business development functions where it is closer to decision makers. This set up ensures maximum efficiency and influence, enabling CI to provide competitive insights, evaluate alternatives, support decisive actions, and monitor competitors (Pirttila, 1998; Calof & Breakspear, 1999; Miller, 2001; Saayman et al., 2008; Cavallo, Sanasi, Ghezzi & Rangone, 2020). Such positioning enhances the efficacy of the CI within an organisation (Pirttila, 1998). By delivering assessments and

highlighting potential implications, CI equips decision makers with the marketplace knowledge necessary to guide strategic decisions (Jaworski & Lee, 1992).

An orientation-based intelligence function plays a crucial role in shaping the decisions and actions of an organisation. This function operates on two distinct levels: tactical and strategic. Operational-level managers who are driven by a tactical orientation focus on short-term decisions, immediate actions and day to day operational efficiency. Their efforts are primarily directed toward addressing immediate challenges and achieving short term organisational goals. In contrast, upper-level managers adopt a strategic orientation that emphasising on long-term decisions and actions, broader organisational objectives and sustainable growth. Their decisions are forward looking, centered on shaping the organisation's direction, maintaining a competitive advantage and ensuring alignment with the organisation's mission and vision. Together, these orientations ensure that the organisation operates effectively in both the short and long term with each level complementing the other to achieve overall success (Garcia-Alsina, Cobarsi-Morales & Ortoll, 2015).

CI and Knowledge Management (KM) are critical to the success of an organisation's strategic management process. Both CI and KM play a pivotal roles in assessing the internal and external environments of an organisation. The integration of these environments provides a foundation for formulating, applying, and evaluating strategies that enable effective strategic, operational and tactical decision-making (Shujahat et al., 2017; Asghari et al., 2020). CI enhances the value of KM by leveraging knowledge management strategies to capture, analyse and utilise existing intelligence effectively (Agarwal, 2006; Nelke & Hakansson, 2015). Organisations must establish robust information management procedures for collecting, classifying, and storing information to support this integration (Garcia-Alsenna et al., 2016).

Organisations should thoroughly examine the advantages and disadvantages of establishing both formal and informal competitive intelligence systems. A formal intelligence system can minimise the duplication of intelligence efforts, centralise data and ensure responsiveness to corporate needs. It offers greater control over data and helps prevent the dispersion of information (Gilad & Gilad, 1986; Cobarsi-Morales et al., 2016). In contrast, informal intelligence system can respond more specifically to the

unique questions and needs of individual units. It is more familiar with its own operations such as industry, product lines, and competitors, and is closer to the collection network making it easier to control the inflow of data (Gilad & Gilad, 1986; Cobarsi-Morales et al., 2016).

The third research objective is to examine whether organizational factors moderate the relationship between Competitive Intelligence (CI) and the organizational performance of Institutions of Higher Learning (IHL) in Malaysia. This objective is guided by the research question: Do organizational factors moderate the relationship between Competitive Intelligence (CI) and the organizational performance of IHLs in Malaysia? Based on this inquiry, the hypothesis is proposed that Process & Structure will moderate the relationship between Competitive Intelligence (CI) and the organizational performance of IHLs in Malaysia (H3). This study seeks to explore how organizational factors such as processes and structures may influence the effectiveness of CI practices in enhancing the performance of IHLs.

Internal Information structure refers to the information infrastructure that includes working structures, procedures, and applications for managing and collecting information. It also involves assigning individuals to manage information management, as well as allocation time and resources effectively. Coordination between units responsible for managing the information should be strengthened to minimise data duplication and improve data accuracy (Garcia-Alsina et al., 2013).

Building an inventory of information along with the use of web-based technologies, chat or discussion rooms, and intranet platforms encourage information and knowledge sharing among employees and fostering intelligence creation (Koseoglu et al., 2016). However, only authorised employees should be granted full access to the information they need to ensure that the information cannot be easily altered or deleted (Kahaner, 1998; Calof & Breakspear, 1999; Marin & Poulter, 2004; Saayman et al., 2008; Nenzhelele, 2015; Asghari, 2020). Executive and senior management must support the formalisation of CI for it to be effective, successful and ensuring the generation of quality CI (Gilad, 1989; Marceau & Sawka, 1999; Nenzhelele, 2015).

Employee involvement- In a formal structure, the support and involvement of the entire organisation are crucial to ensure the success of the CI processes and should not be treated as an isolated function (Bose, 2008). Management and CI professionals must collaborate to define intelligence problems and issues, share and discuss outcomes, and work together on agreed action plans. Management plays a key role in promoting and developing CI within the organisations, thereby legitimising CI as a valuable function. Intelligence reports generated from CI must be tailored to align with top management's interests, projects and decision-making style. For these reports to gain management's support, they must be actionable, trustworthy and directly relevant to organisational needs (Carr, 1988; Mohn, 1989; Saayman et al., 2008).

Learning organisations encourage staff to acquire explicit knowledge, actively participate in knowledge creation and consistently acquire and transfer knowledge. They are also equipped to respond effectively to unpredictable market environments (Garvin et al., 2008; Asghari et al., 2020). This can be further strengthened by organising training sessions, promoting information sharing, and maintaining frequent communication about intelligence needs. Such initiatives help employees better understand CI and their roles in its processes (Saayman et al., 2008; Nenzhelele, 2015).

The impact of CI can be evaluated based on factors such as cost avoidance/reduction, time and cost savings, product control, usability for clients, user/client satisfaction, and revenue growth. The outputs of CI, such as the decision-making insights, information, and knowledge can be audited by senior managers to ensure alignment with the organisation's strategic objectives (Herring, 1996; Calof & Skinner, 1999; Calof, 2017; Izquierdo, Fernandez & Balleste, 2017). Successful implementation of formal CI practices depends on the organisation's capacity to absorb information, its strategic orientation, and the availability of strong financial resources (Baumard & Benvenuti, 1998; Bergeron, 1996).

2.8.2 Awareness and Culture

The realisation of CI can only be achieved if the entire organisation understands its benefits. Employees must be aware that information gathering is the core component of

CI and should consistently keep it in mind (Garvin, 1993; Kahaner, 1996). The involvement and commitment of organisational leaders are crucial for developing the skills, structures, and processes required for world-class CI. Leaders must continuously promote awareness of CI across the organisation (Calof & Skinner, 1999; Nenzhelele, 2015). However, CI will not significantly impact an organisation if it relies solely on senior managers support unless CI is regularly integrated into planning and strategic decision-making processes (Viviers et al., 2002). Additionally, appropriate education about CI should be implemented to foster positive attitudes toward CI (Calof & Viviers, 2001; Viviers et al., 2005). Finally, an organisation must integrate, embed and align CI with its infrastructure ensuring it reflects industry trends and adapts effectively to change (Viviers et al., 2005).

CI can also be strengthened by fostering a culture of competitiveness and information sharing within the organisation. It enables organisations to remain competitive by identifying new opportunities and provides systematic programmes for gathering and analysing information about customers, competitors' current positions and potential future moves, legislation, suppliers, and industry characteristics (Prescott, 1989; Viviers et al., 2002). Achieving world-class CI requires an organisational culture that prioritises information-sharing (Marceau & Sawka, 1999). Furthermore, highly market-oriented organisations strongly supports a culture of competitive intelligence and data collection which further enhancing the effectiveness of CI (Qiu, 2008).

Thus, the hypothesis 4 is H4: Awareness and culture will moderate the relationship between Competitive Intelligence (CI) and the organisational performance of the Institutions of Higher Learning (IHL) in Malaysia.

Organisational factors are the crucial pillars in ensuring the success of activities within any organisation. These factors represents an organisation's internal strengths which it must actively maintain and enhance. These factors provide direction, establish guidelines and encourage cooperation and teamwork among individuals and groups to achieve their superordinate goals. CI is a process with systematic characteristic can significantly contribute to the realisation of targeted objectives. However, issues such inconsistencies and instability may arise but with the support of well-established

organisational factors, organisations can mitigate these challenges and consistently achieve their objectives.

2.9 ORGANISATIONAL PERFORMANCE OF INSTITUTIONS OF HIGHER LEARNING

Performance indicators are essential for measuring an organisation's performance. Ball & Halwachi (1987) emphasise the importance of establishing measurable indicators to evaluate organisational success. For an indicator to be effective, it must be relevant, verifiable, unbiased, quantifiable, economically feasible, and institutionally acceptable (Sizer, 1979). Organisational performance is defined by an organisation's ability to create and deliver value to its internal and external stakeholders and achieve its strategic goals and objectives (Antony & Bhattacharyya, 2010; Asif & Searcy, 2014a; Daft, 2001).

Institutions of Higher Learning (IHL) contribute to the development of individuals and society by disseminating knowledge, developing skills and attitudes, and cultivating creativity. These roles prepare society to engage in an increasingly technological world (Clarice, Hough & Stewart, 1984). In fulfilling these roles, IHL combine academic and administrative systems with various stakeholders, utilising performance indicators to evaluate their effectiveness (Gough & Scott, 2008; Abu Bakar, Hilman & Kaliappen, 2018).

The long term success and continuous improvement of IHLs rely on stakeholders relationship. Effective engagement with stakeholders enables institutions to meet their demands, improving organisational efficiency and ensuring survival of the institutions (Asif & Searcy, 2014a; Chinta, Kebritchi & Ellias, 2016). Performance indicators play a critical role in public policy-making decision by enhancing institutional accountability, informing resource allocation and facilitating comparisons across institutions (Pollard et al., 2013; Tee, 2016; Ball & Wilkinson, 1994; Sahney & Thakkar, 2016).

Initially, performance indicators in Institutions of Higher Learning (IHL) focused on teaching and research (Birch & Calvert, 1977; Cave, Kogan & Hanney, 1989; Johnes & Taylor, 1990; Johnes, 1996; Ball & Wilkinson, 1994; Pollard et al., 2013; Asif & Searcy, 2014; Johnes, 2016; Tee, 2016). Over time, these indicators expanded to encompass services, financial performance, and service to society (Udari, Farcas & Tiron-Tudor, 2017; Buss, 1975; Clarice, Hough & Stewart, 1984). The indicators are generally classified into internal, external, and operational/management categories (Jarratt, 1985; Wang, 2010; Abu Bakar, Hilman & Kaliappen (2018). Table 2.2 summarises 72 performance indicators identified in the previous studies.

Institutions of Higher Learning (IHL) must regularly monitor their performance through well defined and aligned performance indicators. These indicators must reflect the institution's mission, objectives and strategic choices such as whether to focus on a local or global market, a mass or elite approach, and specialised or multidisciplinary disciplines (Vlasceanu, Grunber & Parlea, 2004). Performance measurement can be achieved through the use of peer evaluations and strategic alignment of indicators with institutional goals (Ball & Wilkinson, 1994).

Developers of world university ranking systems have formulated different sets of performance indicators to measure the performance of universities worldwide. Prominent world ranking systems include the Academic Ranking of World University (ARWU), Quacquarelli Symonds Company (QS), Times Higher Education (THE), U-Multirank, and the Centre for Science & Technology Science (CWTS) Leiden are the famous world ranking systems (Moed, 2017). Nonetheless, only ARWU, QS and THE are widely used by scholars, administrators, policymakers and students (Hazelkorn, 2014). The World University Ranking System uses 48 performance indicators, as illustrated in Table 2.3.

The ranking system should consider the impact of IHL on society and the economy rather than focusing solely on research performance. Teaching and contributions to society should also be included in the ranking system as these factors can impact the socioeconomics landscape (Udari, Farcas & Tiron-Tudor, 2017)., Government, society, and industry undeniably consider the quality of higher education to be determined in part by these rankings (Udari, Farcas & Tiron-Tudor, 2017), and

the reputation of institutions of higher learning is closely tied to their ranking (Berbegal-Mirabent & Ribeiro-Soriano, 2015). For a more comprehensive assessment, ranking systems should also consider differences in objectives, missions, structures, organisational cultures, sociocultural, and political-economics forces that may affect the performance of institutions of higher learning (Berbegal-Mirabent & Ribeiro-Soriano, 2015; Fauzi, Tan, Daud & Awalludin, 2020).

The performance measurement scale developed by Abu Bakar et al. (2018) and Hernandez, Polanco & Escobar (2020) comprises two main systems: the academic system, which encompasses academics, research, outreach, and internationalisation, and the administrative system which covers resources-infrastructure, resources-financial and assessment.

Table 2.3 provides an overview of various performance measurements used to assess higher education institutions (HEIs), as argued by several authors. Cartter (1966) focused on reputation ranking, while Roose, Andersen et al. (1970) included performance indicators such as the amount of resources, number of students admitted, and research reputation. Jarratt (1985) categorised performance into three types: internal, external, and operational. Internal indicators include market share of undergraduate applications, graduation rates, and attraction of research funds, while external measures focus on employment acceptability of graduates and staff publications. Operational indicators cover unit costs, staff/student ratios, and library resources. Later studies, such as those by Tee (2016) and others, emphasised teaching-related indicators like student retention rates, employability, and degree results, along with research indicators like publications, research grants, and postgraduate student numbers. Additionally, academic, research, extension, and resource-related measures were included by authors like Abu Bakar et al. (2018) and Yaakub & Mohamed (2019), who also considered financial and non-financial performance indicators. Finally, Sahibzada et al. (2022) added factors such as research productivity, student satisfaction, curriculum development, and responsiveness to environmental challenges. These performance indicators are widely used in evaluating the performance of HEIs across various dimensions including teaching quality, research output, and financial management. Table 2.3 summarises the performance indicators for institutions of higher learning.

Table 2.3 Summary of Performance Indicators

AUTHOR	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
Carter (1966)		Reputation ranking (1).
Roose, Andersen et.al. (1970)		Universities position based on resources amount (2), number of students admitted (3) & research reputation (4).
Jarratt (1985)	Internal, External, Operational	<p>Internal: market share of undergraduate applications (by subject) (5), graduation rates (6) and classes of degree (7), attraction of masters and doctorate students (8), degree success rate (and time taken) (9), attraction of research funds (10) and teaching quality (11).</p> <p>External: graduates employment acceptability (12), first destination of graduates (13), reputation judged by external reviews (14), staff publications and citations (15), patents, inventions (16), consultancies (17), membership (18), prizes (19), medals of learned societies (20) and conference papers (21).</p> <p>Operating: unit cost (22), staff/student ratios (23), class sizes (24), course options available (25), staff workloads (26), library stock (27), and computing availability (28).</p>

AUTHOR	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
(Tee, 2016; Asif & Searcy, 2014; Pollard et al., 2013; Johnes, 1996; Ball & Wilkinson, 1994; Johnes & Taylor, 1990; Cave, Kogan & Hanney, 1989; Birch & Calvert, 1977)	Teaching	Teaching: undergraduate wastage rate/non-completion rate (29), the first destination of graduate, postgraduate and professional training (30), student questionnaires (31), recurrent costs per student (in real term) (32), first degree home graduate, student entry qualification (33), degree results (34), number of graduates (35), undergraduate success/pass rate, market share of undergraduate applications by subject, classes of degrees, and destinations of graduates after 6 months, labour market success by subject (36), widening participation, value added (37), retention/non-continuation, employment/employability, student intake, social mobility/social justice (38) and fair access and social rate of return to university first degrees (39).

AUTHOR	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
(Udari, Farcas & Tiron-Tudor, 2017; Sahney & Thakkar, 2016; Tee, 2016; Ball & Wilkinson, 1994; Johnes & Taylor, 1990; Cave, Kogan & Hanney, 1989; THES, 1986; Jarratt, 1985).	Research	Papers published in journals or top journals and conferences (40), grants received for sponsored and consultancy projects (41), number of patents registered, number of postgraduate research students (42), research quality rating (43), research output (44), research income (45), submission rates for research degrees (46), external academic staff appointment (47), publications and citations counts.
(Tee, 2016; Wang, 2010; Johnes & Taylor, 1990; Jarratt, 1985).	Operational/management performance	University ranking unit costs (48), cost per student staff/students ratio, financial and human resources (49).

AUTHOR	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
Abu Bakar, Hilman & Kaliappen (2018); Hernandez, Polanco & Escobar (2020).	Academic, research, extension, resources, internalisation, assessment	<p>Academic: Academic reputation (50), student-teaching ratio (51)</p> <p>Research: Publication, research group (52), technology development (53).</p> <p>Extension: Employability, continuing education (54), consulting</p> <p>Resources: Academic support services (55), infrastructure (56), income diversity (57).</p> <p>Internationalisation: Mobility (teachers & students) (58), foreign students (59), foreign academic staff (60).</p> <p>Assessment: Positioned brand (61).</p>
Yaakub & Mohamed (2019)	Non-financial and financial	Academic effectiveness (62), rating criteria (63), research capacity & capability (64), financial performance (65).
Sahibzada, Jianfeng, Latif, Shafait & Sahibzada (2022)		Research productivity (66), student satisfaction (67), curriculum development (68), ranking (69), academic efficacy (70), quality development (71), and responsiveness to environmental challenges (72).

Table 2.4 Performance Indicators Used by World Ranking Systems

WORLD UNIVERSITY RANKING SYSTEM	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
Academic Ranking of World University (ARWU)	Education quality, Faculty quality, Research output, Per capita performance	<p>Education quality: Number of alumni who have won Nobel Prizes and Fields Medal.</p> <p>Faculty quality (1): Nobel Prizes and Fields Medals granted to faculty members (2) and highly cited researchers (3).</p> <p>Research output: Papers published in Nature and Science (4) and papers indexed in Science Citation Index (SCI) and Social Science Citation Index (SSCI) (5).</p>
Quacquarelli Symonds Company (QS)	Academic peer reputation survey, Employer survey, Citation per faculty, Faculty-student ratio, International students, International faculty	

WORLD UNIVERSITY RANKING SYSTEM	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
Times Higher Education (THE)	Teaching, Research, Citation Impact, Industry income (research funding from industry), International outlook	<p>Teaching: Reputation survey for teaching (6), Staff-student ratio (7), Doctoral-bachelor's ratio (8), PhDs awarded (9).</p> <p>Research: Institutional income per faculty member (10), Reputation survey for research (11), Research grant (12).</p> <p>Citation impact: Papers in peer-reviewed journals (13).</p> <p>International outlook: Ratio international-domestic students (14), Ratio international-domestic staff (15), Publication with international co-authors (16).</p>
U-Multirank (U-Multirank 2020)	Teaching and learning, Research, Knowledge transfer, International orientation, Regional engagement	<p>Bachelor graduation rate (17)</p> <p>Masters' graduation rate (18)</p> <p>Graduating on time (Bachelors) (19)</p> <p>Graduating on time (Masters) (20)</p> <p>Research: External research income (21)</p> <p>Research publications (size normalised) (22), Art-related output (23), Citation rate (24), Top cited publications (25), Interdisciplinary publications (26)</p> <p>Number of post-doc positions (27),</p>

WORLD UNIVERSITY RANKING SYSTEM	TYPE OF PERFORMANCE MEASUREMENT	PERFORMANCE INDICATORS
		<p>Knowledge transfer: Income from private sources (28), Co-publications with industrial partners (29), Patents awarded (size normalised) (30), Industrial co-patterns (31), Spin offs (32).</p> <p>The publication cited in patents (33), Income from continuous professional development (34),</p> <p>International orientation: Foreign language bachelor programmes (35), Foreign language master programmes (36), Student mobility (37), International academic staff (38), International doctorate degrees (39), International joint publication (40).</p> <p>Regional engagement: Bachelor graduates working in the region (41), Student internships working in the region (42), Regional joint publication (43), Income from regional source (44), Master graduates working in the region (45).</p>
Centre for Science & Technology Science (CWTS) Leiden	Research	<p>Publication output (46)</p> <p>Citation impact (highly cited publication) (47)</p> <p>Scientific collaboration with industry/other institutions (48)</p>

Table 2.4 provides various world university ranking systems utilize different types of performance measurements and indicators to assess higher education institutions globally. The **Academic Ranking of World Universities (ARWU)** evaluates education quality, faculty quality, and research output, with performance indicators such as the number of Nobel Prizes and Fields Medals awarded to alumni and faculty, and the volume of papers published in prestigious journals like *Nature* and *Science*. The **Quacquarelli Symonds (QS)** ranking system uses academic peer reputation surveys, employer surveys, citation per faculty, faculty-student ratios, and international student and faculty proportions as key performance indicators. **Times Higher Education (THE)** focuses on teaching, research, citation impact, industry income, and international outlook, with specific measures like staff-student ratios, research income per faculty member, and international student ratios. The **U-Multirank** system includes teaching, research, knowledge transfer, international orientation, and regional engagement, measuring graduation rates, research income, interdisciplinary publications, knowledge transfer through patents and spin-offs, and international collaborations. Lastly, the **Centre for Science & Technology Studies (CWTS) Leiden** primarily measures research outputs, citation impact, and scientific collaboration with industry and other institutions. These ranking systems offer a comprehensive view of university performance, with a particular emphasis on research, teaching quality, and international collaborations.

In short, Table 2.3 outlines various performance measurements used to assess higher education institutions (HEIs) as proposed by several authors. Early studies like Cartter (1966) focused on reputation ranking, while Roose, Andersen et al. (1970) highlighted indicators such as resources, student numbers, and research reputation. Jarratt (1985) categorized performance into internal, external, and operational indicators, covering factors like market share, graduation rates, research funding, and staff publications. Subsequent studies, such as those by Tee (2016) and others, emphasized teaching and research indicators, including student retention, employability, and research grants. Authors like Abu Bakar et al. (2018) and Yaakub & Mohamed (2019) expanded on these, adding financial and non-financial measures. Sahibzada et al. (2022) further incorporated factors like research productivity, student satisfaction, and responsiveness to environmental challenges. Table 2.4 then describes global ranking systems, such as ARWU, QS, THE, U-Multirank, and CWTS Leiden,

which evaluate HEIs based on education quality, faculty reputation, research output, and international collaborations, offering a comprehensive view of university performance across multiple dimensions. These rankings emphasize research, teaching quality, and global engagement.

High-quality and competent graduates contribute significantly to society and the well-being of the country. The main achievement of institutions of higher learning lies in their ability to produce graduates with high-quality profiles who are capable of addressing societal challenges (Suryadi, 2007). The effectiveness of these institutions depends on their capacity to meet the demands of the economic, socio-political, technological, ecological, and educational environments while aligning with society's long-term needs (Sizer, 1979).

IHL must creatively align their internal capabilities with the evolving world of knowledge and the global economy. The development of a nation's global and knowledge economy can only be driven by universities, research, innovation, and knowledge (Guthrie, Neumann, 2007). Higher education is tasked with producing quality graduates, conducting impactful research, and providing services that stimulate economic and human capital development (Ahmad & Soon, 2015). The Ministry of Higher Education (MoHE) has directed Malaysian institutions of higher learning to address financial sustainability challenges through various sources including academic research, asset optimization, participation in financial activities, business ventures, endowment, waqf, and fundraising (MoHE, 2016).

In the era of globalisation, institutions of higher learning worldwide compete to attract potential students. The democratisation and massification of higher education have led to increased enrollment of international students' in Malaysia (Jaafar, Jizat, Ismail & Yusof, 2017). Therefore, institutions of higher learning must focus on the effectiveness of their programme, addressing market needs, ensuring relevance, improving graduate employability, and enhancing teaching and learning practices and assessment to produce quality graduates for both national and international workforces (Nor & Asmawi, 2018). Additionally, these institutions must ensure the quality of the study environment, enhance institutional influence, be customer-focused, maintain

affordable tuition fees, provide good facilities, and create a conducive social environment and location (Jaafar et al., 2017).

The globalisation of higher education, also known as cross-border education or borderless higher education, has prompted institutions of higher learning (IHL) to remain competitive by producing globally knowledgeable workers who are internationally recognised. Therefore, IHLs must offer professional, industry-driven courses and provide a broader range of programme choices to sustain their performance (Nor & Asmawi, 2018; Lee, 2015). IHLs need to differentiate themselves from one another to remain viable in the highly competitive education industry (Wu & Hawkins, 2018).

IHLs have been increasingly focused on improving their global ranking. University rankings play a significant role in shaping the strategic planning and reforms of institutions of higher learning in Malaysia, despite the controversies and debates surrounding them (Nor & Asmawi, 2018). University rankings accentuate research and publications, which affect rankings, but they do not fully reflect the true performance or quality of an institution (Jaafar et al., 2017; Azman, Pang, Sirat & Yunus, 2014). However, by intensifying publications, IHLs can improve their global ranking, which in turn could attract more international students to study in Malaysia.

IHLs can enhance their performance through excellent and world-class research. Research plays a crucial role in the prosperity of a country, the well-being of its citizens in the knowledge-based era, and serves as an indicator of the country's economic competitiveness and the sustainability of academic excellence (Abbott & Doucouliagos, 2004; Azman, Sirat & Pang, 2016). Key attributes of research include the amount of research funding received, collaborations with local and renowned international research universities, industry partnerships, publications in top journals and proceedings, the number of patented commercial products, research grants applied for, number of publications, conferences attended, project values granted, consultation hours with industry, and the number of intellectual properties produced (Padlee, Reimers, Mok, Anuar & Ahmad, 2019).

The performance of IHLs can be significantly enhanced through the strategic use of performance indicators, research excellence, and stakeholder engagement. By refining these indicators and focusing on both local and global performance factors, IHLs can sustain their competitiveness and ensure their contribution to society and economy in the long term.

2.10 THEORETICAL FRAMEWORK

The theoretical foundation of this study is founded on the RBV (Wernerfelt, 1984) with a specific focus on the KBV (Grant, 1996). This study also will expand on the Strategic Intelligence Cycle (Montgomery & Weinberg, 1979). According to Wernerfelt (1984), resources that a firm develops or acquires are important consequences of the firm's competitive advantage and performance. Barney (1986) further stressed the attributes of the resources that should be VRIN to gain superior competitive advantage and performance. Knowledge is considered crucial organisation's strategically significant resource, which emphasises the creation of knowledge by the individual and the organisation's role to create, apply, coordinate, and integrate the knowledge (Grant, 1996).

The strategic intelligence cycle acts as a premise for CI to generate intelligence that includes planning & focus, collection, analysis, and Communication of information (Montgomery & Weinberg, 1979). The combination of theories and models was adopted to develop a research model of the Effect of CI on Organisational Performance.

The theoretical framework in Figure 2.2 explains the relationship between Competitive Intelligence (CI), Knowledge-Based View (KBV), Resource-Based View (RBV), and Stakeholder Theory in relation to academic and administrative performance. It shows how the CI process, consisting of planning, collection, analysis, and communication, is linked to both KBV and RBV, emphasizing the role of process & structure, awareness, and culture. These factors influence both academic and administrative performance through the lens of RBV, which is used to evaluate how CI practices impact organizational outcomes. The framework suggests that CI practices, when aligned with organizational structures and cultural awareness, contribute to

enhanced performance across various stakeholder groups, including academic and administrative entities.

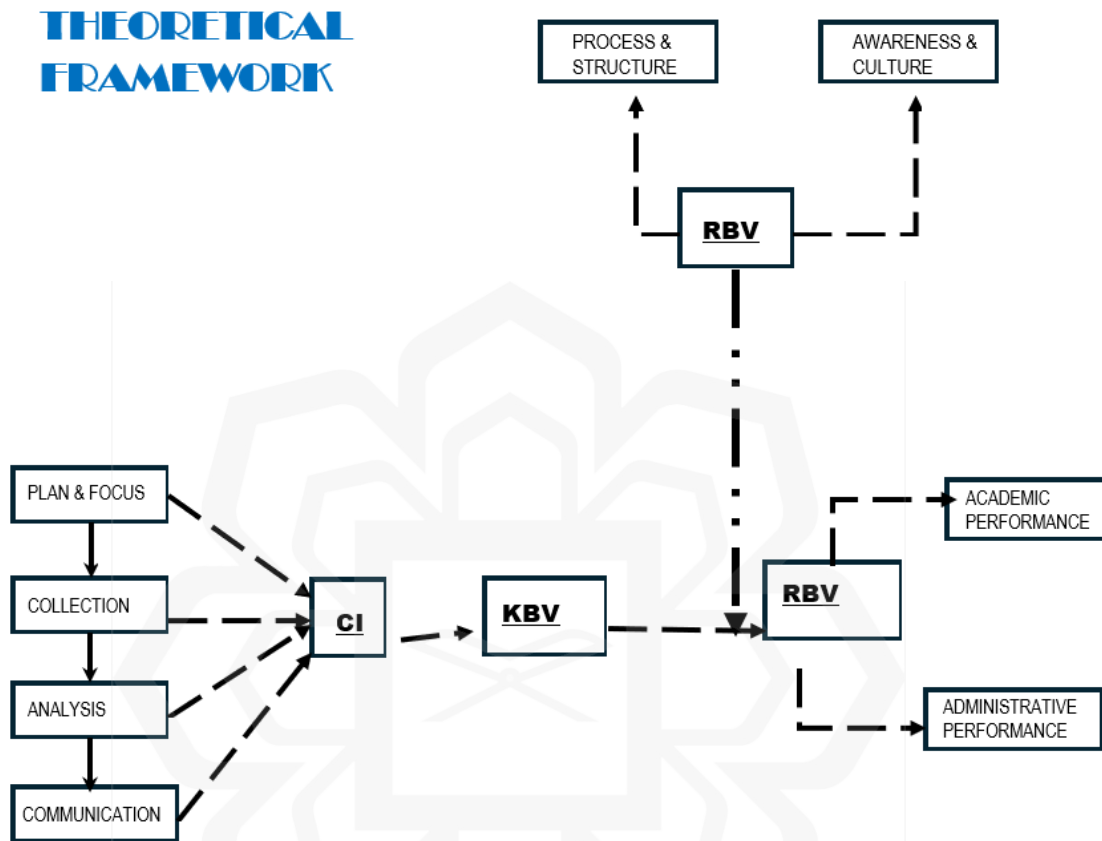


Figure 2.2 Theoretical Framework

This section will highlight the research's conceptual development based on the literature review deliberated earlier in the previous chapters. This study attempts to examine the relationship between CI and organisational performance. The variables of CI include the mandatory stages such as planning & focus, collection, analysis, and Communication of information. The organisational factors such as formal structure, internal information, employee involvement, and awareness/culture are tested as the moderating variables in the relationship between CI and organisational performance.

The research framework proposes that CI may directly affect organisational performance. This relationship is based on the notion that CI could develop valuable resources after the intelligence process. The decision-makers would then use the

intelligence produced by CI in their decision-making that could determine the performance of their organisation. The research framework also proposes that organisational factors such as formal structure, internal information, employee involvement, and awareness/culture may moderate the relationship between CI and organisational performance.

2.11 RESEARCH FRAMEWORK

Figure 2.3 depicts the research framework on the relationship between Competitive Intelligence (CI) and organizational performance, focusing on key stages such as planning, collection, analysis, and communication. It shows that the CI process influences organizational performance through two main moderating factors: **Process & Structure** (H3) and **Awareness & Culture** (H4). The arrows indicate that these factors can enhance or hinder the impact of CI on academic performance and administrative performance.

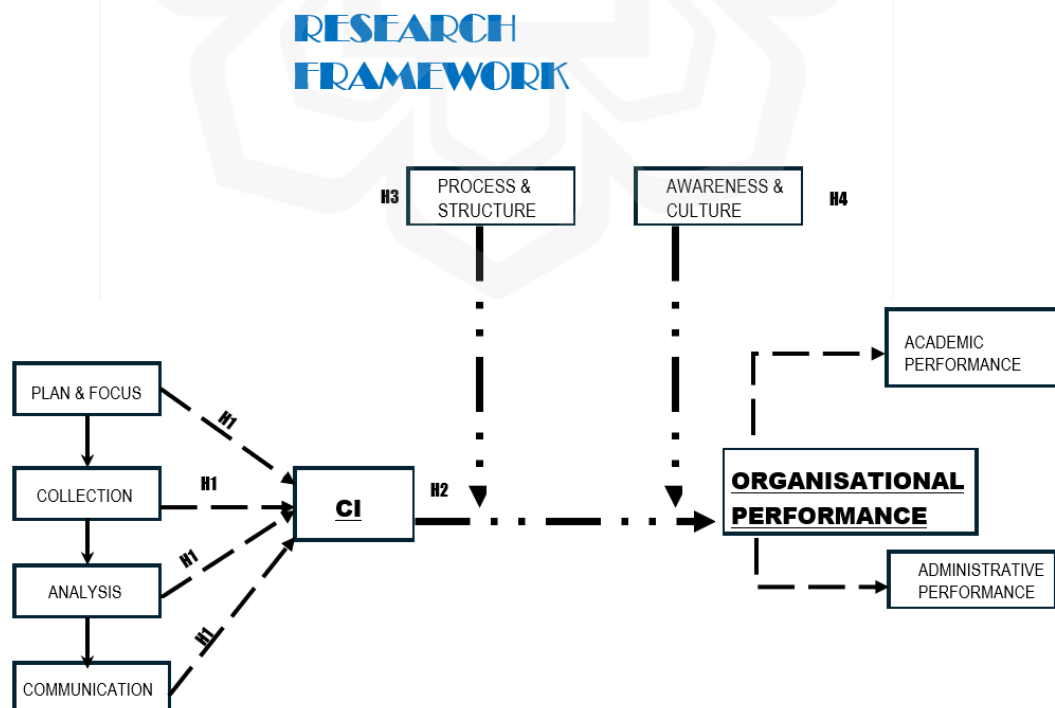


Figure 2.3 Research Framework

Specifically, **H1** and **H2** hypotheses suggest that the stages of CI—planning, collection, analysis, and communication—directly influence overall organizational performance. This framework suggests that a well-structured CI process, along with a culture that fosters awareness, can significantly improve the performance of institutions, impacting both academic outcomes and administrative efficiency.

2.12 CONCLUSION

Chapter 2 begins by elaborating on three key theoretical frameworks: the research-based theory, knowledge-based theory, and the strategic intelligence cycle that are closely linked to competitive intelligence. An organisation must align its internal strengths, resources, and capabilities, with the external environment, especially emphasise on developing new knowledge that fosters sustainable competitive advantage. Meeting the needs and expectations of stakeholders is essential for organisations seeking to improve performance and sustain their position in the market. Institutions of Higher Learning (IHL) in Malaysia face numerous challenges, particularly in meeting their stakeholders expectations and maintaining competitiveness in the education industry.

Chapter 2 explores the definition and process of competitive intelligence, followed by assessment of its key constructs and contextual factors that may affect CI and an organisation's performance. The chapter also presents the theoretical framework and hypotheses, providing a foundation for investigating the relationship between CI constructs and the performance of Institutions of Higher Learning in Malaysia.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The researcher used quantitative methods for this study to investigate the effect of Competitive Intelligence (CI) on the organisational performance of Institutions of Higher Learning (IHL) in Malaysia and moderated by organisational factors. Recent studies have discovered that CI is a process, product, and practice (Pellissier & Nenzhelele, 2013). Quantitative research is pertinent to understand how one or more variables can influence each other (Creswell, 2009). Quantitative methods are also used to develop, test theories and answer research questions (Creswell & Creswell, 2017). Therefore, a quantitative method was suitable to deal with the identified research problem and purpose.

The quantitative investigation may explain the effect of the constructs of CI on the organisational performance of higher learning institutions in Malaysia. Specified hypotheses and anticipated theories had been laid down which require statistical data to be collected and then analysed in the hypothesis testing. Furthermore, this research will be based on the existing literature that are related to competitive intelligence practices and its constructs together with organisational factors that affect the organisational performance of institutions of higher learning in Malaysia as mentioned in research questions in Chapter One and the hypotheses in Chapter Three. For a conclusion, hypotheses and research questions of this research were finally tested and answered by using quantitative method.

The constructs of Competitive Intelligence (CI) that will be deliberated in this study are Plan & Focus, Collection, Analysis and Communication, Organisational Factors constructs are Process & Structure and Awareness & Culture and constructs for Organisational Performance (OP) are Academic Performance and Administration Performance. The 5-point Likert scale has been used in the study which captures the degree of opinion from respondents. The clarity of the content of the questionnaire was assessed through the pretesting of the questionnaires.

The data from this study was analysed by using Statistical Package for the Social Sciences (SPSS) version 22 and Partial Least Squares Structural Equation Model (PLS-SEM) version 4. SPSS has been used to analyse data that includes descriptive statistics such as means, standard deviation, frequencies and correlation. while PLS-SEM has been used for measurement and structural model. The reliability and validity have been analysed by using the Cronbach's alpha, Composite Reliability, Average Variance Extracted (AVE) and CFA. Finally, the structural model for this study was measured through Collinearity Test and Structural Model Path Coefficient.

3.2 POPULATION AND SAMPLING

In this study, the researcher identified the total number of institutions of higher learning from the Ministry of Higher Education (MoHE) website. It includes 20 public universities, 36 polytechnics, 104 community colleges, and 434 private institutions of higher learning. The total number of IHL is 594. The researcher used power analysis technique in identifying sample size in this study.

Moreover, the unit of analysis is the individual institutions of higher learning. Specifically, it involves individuals that are assigned within departments or areas of responsibility such as formulating strategic planning and monitoring the performance of their institutions. They were identified as suitable persons as they would gather all information from the relevant departments, transform it into intelligence, and subsequently disseminate it to their top management for decision-making. The target sampling frame for this study would include all IHL in Malaysia.

3.3 SURVEY INSTRUMENTS

A structured questionnaire and mailed questionnaires were distributed to the respondents. A closed-ended structured questionnaire consisting of 46 questions was e-mailed to the specified respondents to ensure they responded to the completed questionnaire. This study adapts and adopts the questionnaire developed by Saayman et

al. (2008) pertaining to CI and organisational factors as a result of the global survey conducted by Sawka et al. (1995) and revised by Calof & Breakspear (1999), Calof & Dishman (2002), Viviers et al., (2002) and also instruments developed by Abu Bakar et al., (2018) and Hernandez, Polanco & Escobar (2020) to gauge the organisational performance of IHL (Table 3.1).

There was a total of three panels of experts that reviewed and gave feedback on the accuracy of the topic and the usage of the language for content validity. Three experts were involved in the pre-test procedure, comprising two senior academicians and one practitioner that were involved in strategic management as supervisors recommended. These senior academicians, both holding PhD. degrees, deal with the formulation of strategic planning, with one affiliated with International Islamic University Malaysia and Universiti Sains Islam Malaysia.

All recommendations for amendments have been made to the questionnaires in written form and were considered for further changes to the questionnaire. For instance, some questions that were found to be redundant were removed to improve response rate and free from ambiguity. This research utilises the online survey where questionnaires were prepared in google forms and distributed to the email of the respondents. By using this approach the questionnaires could be sent directly to the person who has been assigned to fill in the questionnaire. The completed google form questionnaires were returned to the researcher through online.

Likert scale for the closed-ended questions was included in the research. This scale consists of statements that express a favourable or unfavourable attitude toward the object of interest. Each survey item was aligned to an ordinal, 5 -point Likert scale with the ratings of *strongly agree (5)*, *agree (4)*, *neutral (3)*, *disagree (2)* and *strongly disagree (1)* also *Never (1)*, *Rarely (2)*, *Sometimes (3)*, *Most of the time (4)* and *Always (5)*(Refer to Appendix A). The survey took approximately 10-15 minutes to be completed.

The questionnaire comprised five sections: In total, the instrument contained 55 items: Section 1: Demographic Background (5) , Section 2: CI in the organisation (6), Section 3: CI system in the organisation (14), Section 4: Intelligence practices currently

in place in the organisation (10), and Section 5: Organisational performance of IHLs in Malaysia (20). The respondents' personal information collected through the questionnaires focuses on their position in the organisation, educational background, and years spent in their current job.

The researcher has identified variables for this research based on the review of literature and that can be classified based on the following variables:

- (i) Dependent variable – Organisational performance (Academic and Administration)
- (ii) Independent Variables – Competitive Intelligence (Plan & Focus, Collection, Analysis and Communication).
- (iii) Moderating Variables – Process & Structure and Awareness and Culture

Table 3.1 Constructs Operationalisation

Construct	Sub-Construct	Item	Survey Question	Citation
CI	Planning	PF1	We are concerned about the plan and intentions of our key competitors, alliances, suppliers, distributors, and other stakeholders.	Saayman et al. (2008)
		PF2	Our organization produces intelligence reports and assessments on emerging technologies that we believe are the most important.	Saayman et al. (2008)

Construct	Sub-Construct	Item	Survey Question	Citation
		PF3	We meet with senior managers to identify their intelligence requirements/needs.	Saayman et al. (2008)
	Collection	CL1	Our employees report information about our competitors in foreign markets to the right manager for decision-making.	Saayman et al. (2008)
CI		CL2	Our organization has a variety of methods for collecting information (e.g., Trade shows, websites, industry reports, etc.).	Saayman et al. (2008)
		CL3	We evaluate the reliability of our sources of information (e.g., persons, publications, internet, etc.).	Saayman et al. (2008)
		CL4	We train/prepare our employees about what information they should look for before they go to trade shows, exhibitions, conventions, etc.	Saayman et al. (2008)

Construct	Sub-Construct	Item	Survey Question	Citation
CI	Collection	CL5	Results from exit interviews/job interviews are used in our intelligence system.	Saayman et al. (2008)
		CL6	We maintain a comprehensive map or inventory of internal information and knowledge.	Saayman et al. (2008)
	Analysis	AL1	Our organization develops profiles on emerging technologies to better understand their characteristics, potential applications, and market advantages.	Saayman et al. (2008)
		AL2	We use information management tools (e.g., data mining, data warehousing, OLAP, or ,Business intelligence software) to understand our customers.	Saayman et al. (2008)
	Communication	CM1	Our intelligence findings are widely distributed within the organization.	Saayman et al. (2008)

Construct	Sub-Construct	Item	Survey Question	Citation
	Awareness & Culture	AC1	Our organization recognizes CI as a necessary activity for business.	Saayman et al. (2008)
		AC2	Most employees understand what competitive intelligence is.	Saayman et al. (2008)
		AC3	Competitive intelligence can be used to create competitive advantage.	Saayman et al. (2008)
	Process & Structure	PS1	Our organization has an incentive to encourage employees to report their competitive observations and information.	Saayman et al. (2008)
		PS2	Competitive intelligence is a formal activity in our organization.	Saayman et al. (2008)
		PS3	There is a central coordination point for receiving competitive intelligence information.	Saayman et al. (2008)
		PS4	We have a formal knowledge/information management system.	Saayman et al. (2008)

Construct	Sub-Construct	Item	Survey Question	Citation
		PS5	We have a long-term competitive intelligence plan.	Saayman et al. (2008)
		PS6	We report our intelligence findings to the top management.	Saayman et al. (2008)
	Process & Structure	PS7	We conduct an internal audit knowledge (e.g., identify and catalogue what people know, what report they have published, etc.).	Saayman et al. (2008)
		PS8	Top management uses CI results in their strategic planning and decision-making.	Saayman et al. (2008)
		PS9	Our organization maintains a central record of reliable sources of information.	Saayman et al. (2008)
Organisational Performance	Academic Performance	AP1	Our institution believes the best work is currently taking place in research and teaching within the field of expertise for academic reputation.	Hernandez et al. (2020)
		AP2	Our institution believes in small class sizes and good individual supervision for faculty-to-staff ratio.	Hernandez et al. (2020)

Construct	Sub-Construct	Item	Survey Question	Citation
Organisational Performance		RP1	Our institution believes in research impact and produces publications that attract citations.	Hernandez et al. (2020)
		RP2	Our institution believes in research impact and has research groups that are highly recognised.	Hernandez et al. (2020)
		RP3	Our institution has improved the impact of research by promoting technological development, such as patents.	Hernandez et al. (2020)
		RP4	Our institution observed frequent winning of Nobel prizes and field medals by members of staff.	Hernandez et al. (2020)
		RP5	Our institution observed frequent winning of Nobel prizes and field medals by members of alumni.	Hernandez et al. (2020)
Organisational Performance	Admin Performance	OP1	Our institution produces the best graduates for employment.	Hernandez et al. (2020)

Construct	Sub-Construct	Item	Survey Question	Citation
		OP2	Our institution offers a wide variety of continuing education courses that consider the needs of different members of the public.	Hernandez et al. (2020)
Organisational Performance	Admin Performance	OP3	Our institution offers consultation services and training to the government, private firms, and other societies.	Hernandez et al. (2020)
		IP1	Our institution has a high international mobility of teachers and students making use of inter-institutional elements.	Hernandez et al. (2020)
		IP2	Our institution believes in attracting students from other nations with high ratios.	Hernandez et al. (2020)
		IP3	Our institution believes in providing incentives that attract academics from other nations for a good international faculty ratio.	Hernandez et al. (2020)
		RFIP1	Our institution has adequate resources for operations.	Hernandez et al. (2020)

Construct	Sub-Construct	Item	Survey Question	Citation
		RFIP2	Our institution has excellent academic support services such as books and databases in the library, laboratories, and technological resources.	Hernandez et al. (2020)
		RFIP3	Our institution has an infrastructure with high-quality facilities.	Hernandez et al. (2020)
Organisational Performance	Admin Performance	FP1	Our institution frequently gets research income in the form of a grant through our staff members.	Hernandez et al. (2020)
		FP2	Our institution has diversified its revenue (e.g., co-financed and funded research, extension services, and stock exchanges).	Hernandez et al. (2020)
		ASP1	Our institution's brand is highly positioned.	Hernandez et al. (2020)
		ASP2	Key decision makers are surveyed / interviewed to verify that the intelligence products produced for them satisfy their needs.	Hernandez et al. (2020)

3.3.1 Respondents

The target population in this research are all institutions of higher learning in Malaysia comprising public and private institutions. In this research, the unit of analysis identified in this research is the individual institutions of higher learning. Specifically, it involves individual holding managerial or higher management positions, specifically individual involved in formulating strategic planning and monitoring the performance of the institutions of higher learning. The individual could be the senior staff who had the authority to analyse the data and transform it into intelligence before disseminating it to the decision-makers of the IHL.

In this research the individual IHL serves as the primary unit of analysis with data collected directly from chosen individual of IHL through personal distributed questionnaires. By using this approach the study's sampling frame is tailored specifically to the research objectives, focusing on IHLs in Malaysia.

A non-probability sampling technique (Zikmund, 2000) was identified to select the sample in this study. In purposive sampling, the selection of subjects would be determined by the researcher based on accessibility, availability and the willingness of the participants. The individual that would be selected are generally from the related department or area of responsibility such as corporate strategic planning or corporate strategy and monitoring the performance of their institution.

The researcher had used the PLS ten times rule of thumb to meet PLS-SEM sample requirements (Hair et.al., 2014). The ten times rules indicates the sample size should be equal to the larger of (Hair et.al., 2014):

- i. Ten times the largest number of formative indicators used to measure a single construct, or
- ii. 10 times the largest number of structural paths directed at a particular construct in the structural model.

Therefore, in this study, the exogenous constructs (formatively measured) had a maximum of six indicators. The structural model had three exogenous constructs (CI, Plan & Structure and Awareness & Culture) in explaining the single dependent construct OP. The maximum number of arrows pointing at particular latent variable was four. The rule of thumb for PLS-SEM indicates that for four indicators, a Power = .80, Alpha=.05 and a moderate effect, the sample size for this study should be 42 responses (calculations based on 4 indicators in the proposed model and using the ten time rule). The calculation of 42 responses represented a starting point to determine an appropriate sample size with a sufficient level of accuracy and statistical power. This research has determined the sample size based on Cohen table as shown in Table 3.1.

Table 3.2 Sampe Size Use for this Research

Maximum Number of Arrows Pointing at a Construct	Significance Level											
	1%				5%				10%			
	Minimum R ²				Minimum R ²				Minimum R ²			
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	27
5	205	98	62	50	147	70	45	36	120	58	37	30
6	217	103	66	53	157	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	88	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Source: Cohen, J. A power primer. *Psychological Bulletin*, 112, 155–519.

3.3.2 Validity and Reliability

All items in the questionnaires were tested to ensure validity and reliability through a pilot study with the senior academic administrators involved in formulating strategic planning in the IHL. There were some amendments from the initial questionnaire after the completion of the pre-test. In this study, 12 senior academic administrators were selected for the pilot study. It was conducted to ensure the validity of the items,

understandability, and ease of answering. The study followed all procedures of data entry with coding and proper data cleaning strictly.

Structural Equation Modelling (SEM) techniques such as Partial Least Squares (PLS) were used to test the effect of constructs of CI and its relationship with organisational performance (Bagozzi & Fornell, 1982; Gefen, Straub & Boudreau, 2000). PLS assessed the reliability and validity of the theoretical constructs and estimated the relationships among the constructs/factors (Barclay, Higgins & Thompson, 1995; Abdi, 2007). PLS was also used to provide a general model that will outline paths to many dependent variables. It is also used to analyse paths concurrently instead of one at a time (Fornell & Bookstein, 1982; Gefen et al., 2000).

3.3.3 Data Collection

The data collection started by contacting the selected staff through email or by telephone. The questionnaires were sent through email if the selected staff consented to participate in the survey. The data collection was conducted over 3 months to complete, and the follow-up for the questionnaires was made either by phone or by e-mail. The participants either completed all the survey questions or were allowed to opt out by exiting at any time.

A web-based survey using Google Forms was used to improve the response rate. The survey was conducted online through Google Forms, and all respondents were required to answer each question as a mandatory part of the survey. This approach ensured that no data was missing from the collected responses, thereby improving data quality.

An email notification with a link to the Google form was sent to the selected respondents who were identified through the organisation's staff directory. Statistical Package for Social Sciences (SPSS) was used to analyse data and produce graphs and tables. Before that, the data from the questionnaires was captured in Microsoft Excel.

3.3.4 Data Analysis

The study is quantitative and uses the statistical analysis method to test for the validity and reliability of measures and answer the hypothesised relationship. PLS-SEM is used to analyse both the measurement model and structural model (Hair et.al., 2017). PLS - SEM is suitable for this study as it can handle a small sample size and non-normal data (Hair et.al., 2014).

Measurement model assessment was tested to ensure that only the constructs having good indicator loading, convergent validity, composite reliability and discriminant validity were used in the structural model. Validity tests included convergent validity and discriminant validity. Confirmatory factor analysis (CFA) was used to test convergent validity, with factor loading above 0.7 and average variance extracted (AVE) values beyond 0.5 considered good validity (Fornell & Larcker, 1981; Hair et.al, 2017).

Discriminant validity tested how each latent variable differs from one another (Hair et.al., 2017). Discriminant validity was achieved when the square root of AVE is more than the correlation between latent variables. Construct reliability was assessed with Cronbach's alpha and composite reliability. Values above or equal to 0.7 considered to show good reliability.

Structural model evaluation was used to assess path coefficients and testing their significance through bootstrapping technique. Structural model assessment includes direct and indirect relationship. The direct paths relationship between CI and organisational performance while indirect effects include moderation of process & structure between CI and organisational performance and moderation of awareness & culture between CI and organisational performance.

Standard Root Mean Square Residual (SRMR) is a model fit measure in PLS-SEM with a value lower than 0.1 is considered a good fit. The model's explanatory power assessment also examines the Coefficient of Determination (R^2) and Cohen's Effect Size (f^2). R^2 values indicate substantial in-sample predictive power that measures the proposed research model's explanatory power (Hair et al., 2021). It represents the

variance explained in each of the endogenous constructs. R^2 values of 0.75, 0.50, and 0.25 can be considered substantial, moderate, and weak (Hair et al., 2021).

The model's quality is also measured by calculating Cohen f^2 values, indicating the relative impact of an exogenous construct on the endogenous construct (Henseler et al., 2009). Values of 0.02, 0.15, and 0.35 indicate a weak, medium, or large f^2 . Moreover, a model's predictive power indicates the ability of a model to predict new or future observations. If the Q^2 values are below 0, the model shows poor predictive relevance (Hair et al., 2021). PLSpredict is a technique used to estimate the model on a training sample and evaluate its predictive performance on a holdout sample (Shmueli et al., 2019). It only focuses on the model's key endogenous constructs and does not involve assessing prediction errors for the indicators of all endogenous constructs Hair et al., 2021).

In this procedure, PLS-SEM Root Mean Square Error (RMSE) or Mean Absolute Error (MAE) values must be compared with the naïve Linear regression Model (LM) benchmark to determine the model's predictive power.

This research covers three primary research questions:

1. To what extent is the Competitive Intelligence (CI) process in the Institutions of Higher Learning (IHL) in Malaysia?
2. What is the effect of Competitive Intelligence (CI) on the organisational performance of Institutions of Higher Learning (IHL) in Malaysia?
3. Do organisational factors moderate the relationship between Competitive Intelligence (CI) and organisational performance of Institutions of Higher Learning (IHL) in Malaysia?

Hypotheses. Six hypotheses were developed, as discussed in Chapter 2. The overview of the hypotheses is as follows:

Hypothesis 1: CI comprises four constructs: Focus and planning, Collection, Analysis, and Communication.

Saayman et al. (2008) discovered that CI consists of three constructs, while Freyn (2017) found that CI comprises four constructs, which is similar to the foundational research on the strategic intelligence cycle developed by Montgomery & Weinberg (1979). Testing this hypothesis will be pivotal to determining the actual stages of CI.

Hypothesis 2: CI will significantly impact the organisational performance of IHL.

Yap & Rashid (2011) discovered that CI positively correlates with firm performance.

Hypothesis 3: Process and Structure will moderate the relationship between CI and the organisational performance of higher learning institutions in Malaysia.

On the other hand, Dishman & Calof (2008), Saayman et al. (2008), and Withaka (2016) discovered that formal infrastructure had a significant effect on the effectiveness and efficiency of CI. Therefore, we hypothesise that formal structure enhances CI and moderates the relationship between CI and organisational performance.

Hypothesis 4: Awareness and Culture will moderate the relationship between CI and the organisational performance of higher learning institutions in Malaysia.

Saayman et al. (2008), Dishman & Calof (2008), Withaka (2016), and Freyn (2017) emphasised that awareness and culture had a significant effect on the enhancement of CI. Therefore, we hypothesise that awareness and culture enhance CI and moderate the relationship between CI and organisational performance.

3.4 CONCLUSION

The researcher used the quantitative methods questionnaire for this study. The respondents were selected to test the availability of CI constructs and the extent of CI practices in their universities.

The chapter started with the background of the research based on the outlined objectives and purpose of the research. The sample size was then discussed, followed by the research methodology and research instrument. Sampling techniques, data collection, reliability, and validity of the study were also discussed in this chapter.

The survey instrument was disseminated to all institutions of higher learning in Malaysia. An online survey using Google Forms was emailed to the respective staff identified through their website and further confirmed over the phone. Note that 92 surveys were collected, considered a sufficient sample size (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014 & Hair, Sarstedt, Hopkins & Kuppelwieser, Hair, Hult, Ringle & Sarstedt, 2017).

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 INTRODUCTION

The Partial Least Squares-Structural Equation Modelling (PLS-SEM) technique was used in this research as the research concept is quantitative. The structural model and measurement model are the two main components of the PLS-SEM. The structural model shows the relationships between the latent constructs, while the measurement model presents the unidirectional predictive relationships between each latent construct and its indicators (Hair et al., 2011).

Measurement models can be classified as formative and reflective, which can be run using PLS-SEM. For the reflective indicators, associated coefficients between the constructs and their indicators are called outer loadings, while formative indicators are called outer weights. Any changes in latent constructs for reflective indicators would cause changes in indicators, while changes in the formative indicators would affect the value of the latent construct (Hair et al., 2011).

PLS-SEM is used in developing theories in exploratory research as it focuses on explaining the variance in dependent variables during model examination (Hair et al., 2014). This technique also analyses data to test the hypothesised relationships between different constructs. It tests the reliability and validity of data and the constructs through measurement model and structural model assessments. PLS-SEM was chosen for this study because it works well with smaller sample sizes if the data are not distributed normally and when the models are complex with myriad indicators. It is also the best method when the research objective is related to theory development and prediction (Hair et al., 2011; Hair et al., 2014).

This research collected data through an online survey that had been screened to verify the accuracy and completeness of the data used in this research. The survey responses were 92 received and further scrutinised to exclude answers that did not fit the prescribed criteria.

4.2 DEMOGRAPHICS OF THE RESPONDENTS

A total of 92 completed surveys were received through Google Forms. Characteristics of the questionnaires were (a) gender, (b) age group, (c) educational background, and (d) years spent in the current job. A summary of the demographic characteristics is presented in Table 4.1.

Table 4.1 Demographic Characteristics

Age group	Number of respondents	% respondents
18-27	2	2.2
28-37	24	26.1
38-47	31	33.7
48-57	29	31.5
58 or more	6	6.5
Gender	Number of respondents	% respondents
Female	42	45.7
Male	50	54.3
Educational background	Number of respondents	% respondents
Doctoral degree	24	26.1
Master degree	34	37
Bachelor degree	29	31.5
Others	5	5.4
Post	Number of respondents	% respondents
Top management	34	37
Senior management	30	32.6
Middle management	28	30.4
The year spent in current job	Number of respondents	% respondents
1 to 5 years	32	34.8
11 to 15 years	11	12
16 to 19 years	8	8.7

Age group	Number of respondents	% respondents
20 to 25 years	18	19.6
6 to 10 years	17	18.5
More than 26 years	6	6.5

Formality of Competitive Intelligence (CI) department. A dichotomous question asked whether the organisation had a formal department. Based on 92 responses, 47 (51.1%) had a formal CI department, while 45 (48.9%) stated otherwise.

Formal CI process/framework in the organisation. Another dichotomous question also asked whether the organisation had a formal CI process/framework in their organisation. Consequently, 48 responses (52.2%) had a formal CI process/framework in their organisation, while 44 (47.8%) stated that they did not.

Best position of the CI department/function in the organisation. Here, 38 responses (41.3%) stated that CI should be centralised and attached to the top management, 28 responses (30.4%) mentioned that it should be central coordination with decentralised CI units, 15 responses (16.3%) stated that it should be located in a department or business unit, 8 responses (8.7%) stated that own CI department should be established. The rest of the responses stated that CI has yet to be established in their organisation (1 response), CI must be embedded in every department (1 response), and another 1 response did not have any idea.

The phase of CI function in the organisation. Out of 92 responses, 38 responses (41.3%) mentioned that their CI at the growth phase, 22 responses (23.9%) stated that their CI at the start-up phase, 16 responses (17.4%) stated that they had just established their CI and another 16 responses (17.4%) stated that CI did not exist in their organisation.

Degree of participation from employees in the CI activities. From the survey, 41 responded (44.6%) that average participation, 23 responses (25%) stated that there was high participation from employees, 12 responses (13%) stated that there was low

participation, 9 responses (9.8%) responded very low participation and 7 responded very high participation from employees.

Obstacles to the implementation of CI. Here, 26 responses stated that lack of communication between departments, 22 responses (23.9%) stated that it was not taken seriously, 11 responses (12%) stated that there was no sharing of information between departments, 10 responses (10.9%) stated that no sharing of information between departments, no top management support, lack of communication between departments and it was not taken seriously. Other than that, 5 responses (5.4%) stated that there was no top management support. Another 4 responses (4.3%) stated that there was a lack of communication between departments. It was not taken seriously: 4 responses stated that there was no sharing of information between departments, not top management support, and lack of communication between departments; 2 responses (2.2%) stated no sharing of information between departments, not top management support, lack of communication between departments and it was not taken seriously. Meanwhile, 1 response stated that there was no sharing of information between departments and it was not taken seriously, 1 response stated that there was no top management support and lack of communication between departments, 1 response stated that there was no sharing of information between departments and no top management support, 1 response stated that due to organisational factors, 1 response stated that they use SWOT analysis, 1 response stated that no sharing of information between departments and no top management support, 1 response stated that there was no knowledge of CI and 1 responded that all the reasons as above.

4.3 SAMPLE SIZE

In this study, 6 exogenous constructs are pointing to one endogenous construct, and according to the 10 times rule, $6 * 10 = 60$ observations would be the minimum sample size for this study. However, this study required 75 observations to detect R^2 values of around 0.25 with a significance level of 5% and statistical power of 80% (Cohen, 1992).

4.4 PARTIAL LEAST SQUARE- STRUCTURAL EQUATION MODELLING (PLS-SEM)

SmartPLS 4 software was used in this study to analyse and test the measurement model and the structural path coefficient between the constructs and between the constructs and their indicators with a clear graphical output. Consequently, 2000 samples were used when running the bootstrapping technique analysis.

SmartPLS 4 software runs the PLS-SEM with two models:

- (i) Measurement Model
- (ii) Structural Model

4.4.1 Evaluation of Measurement Model

PLS-SEM enables the researcher to examine the reliability and validity of the construct measures. Reflective and formative constructs require different approaches for evaluation. Internal consistency reliability and validity must be assessed in the reflective measurement models, specifically composite reliability, convergent validity, and discriminant validity (Hair et al., 2017).

In the formative measurement model, the researcher must ensure content validity before collecting the data and estimating the PLS path model. The assessment involves convergent validity, the significance and relevance of indicator weights, and the presence of collinearity among the indicators (Hair et al., 2017).

Measurement for internal consistency reliability consists of Cronbach's Alpha and composite reliability. Cronbach's Alpha and composite reliability values of 0.60 to 0.70 are acceptable, while 0.70 and 0.90 can be treated as satisfactory. Values more than 0.90 indicate that all indicator variables measuring the same phenomenon are not valid to measure the construct and reduce construct validity (Hair et al., 2017; Drolet & Morrison, 2001). Values of composite reliability below 0.60 show a lack of internal consistency reliability.

4.4.2 Measurement of Model Identification

An evaluation of the measurement model was done using SmartPLS 4. Four constructs were identified through Confirmatory Factor Analysis (CFA) and were organised into Lower Order Constructs (LOCs) of CI and two constructs for LOCs for organisational performance. These LOCs were combined to establish formative Higher Order Constructs (HOCs). Hierarchical Component Model (HCMs) proves valuable if the lower order constructs are highly correlated, reducing collinearity issues and solving discriminant validity (Hair et al. 2017).

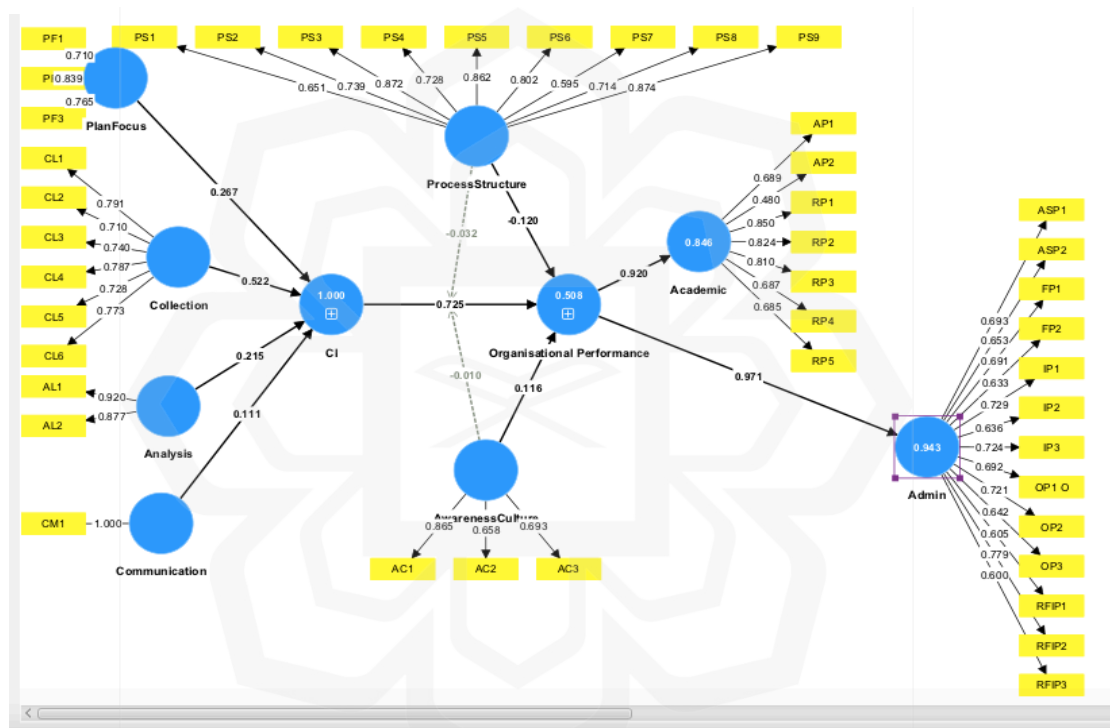


Figure 4.1 Lower Order Construct Measurement Model

4.5 MEASUREMENT MODEL ANALYSIS

Measurement model analysis involves the assessment of convergent validity, internal consistency reliability, and discriminant validity of the instruments. Measurement model analysis for this study was done using SmartPLS 4.

4.5.1 Convergent Validity

Convergent validity is the extent to which a construct converges to explain the variance of its items. Outer loadings of the indicators, t-value, and the Average Variance Extracted (AVE) are the main considerations in evaluating convergent validity. Higher outer loadings on the construct indicate the associated indicators explained by the construct. The acceptable standardised outer loadings should be 0.708 or higher. The t-statistics for each item are also provided by PLS-SEM analysis, which can be used to ensure the statistical significance of the outer loadings. The t-value must be greater than 1.96 for a significance level of 5% ($p < .050$), and 2.57 for a significance level of 1% ($p < .01$) (Hair et al., 2017).

AVE is a grand mean value of the squared loadings of the indicators associated with the construct. AVE 0.50 or higher indicates at least 50% of the variance of the items explaining the construct (Hair et al., 2017). Table 4.2 shows the summary of the measurement model for CI constructs. Table 4.3 presents the measurement model for organisational performance constructs, and Table 4.4 summarizes the measurement model for organisational factors constructs.

Table 4.2 PLS-SEM Results Summary for Measurement Model
(Plan & Focus, Collection, Analysis and Communication)

Latent variable		Convergent Validity			
		Outer Loadings			
		> .400	t>1.96	97.5%Bca CI	>.500
Plan & Focus	PF1	0.718	10.368	0.545-0.823	0.600
	PF2	0.839	26.070	0.750- 0.887 0.885	
	PF3	0.761	11.536	0.583-0.851	
Collection	CL1	0.780	17.819	0.676-0.850	0.571
	CL2	0.726	11.856	0.581-0.821	
	CL3	0.739	10.746	0.574-0.846	
	CL4	0.787	18.186	0.686-0.857	

	CL5	0.727	13.727	0.595-0.811	
	CL6	0.774	16.80	0.650-0.844	
Analysis	AL1	0.916	62.473	0.877-0.937	0.803
	AL2	0.876	29.566	0.795-0.917	
Communication	CM1	1		1	

Table 4.2 shows convergent validity for CI constructs. All the outer loadings for the indicators of all the constructs were beyond the threshold of 0.4, ranging from 0.718 to 0.916. All t-values for all the indicators were also above 1.96 for a significance level of 5%, indicating that all the outer loadings for each indicator are statistically significant. AVEs for all the CI constructs were beyond the threshold of 0.5, which indicates at least 50% of the variance of the items explaining the construct. It shows an acceptable convergent validity for CI constructs.

Table 4.3 PLS-SEM Results Summary for Measurement Model (Academic Performance and Admin Performance)

Latent variable	Indicator	Convergent Validity			
		Outer Loadings			AVE
		> .400	t>1.96	97.5%Bca CI	>.500
Academic Performance	AP1	0.705	9.906	0.547-0.816	0.479
	AP2	0.531	4.028	0.228-0.735	
	RP1	0.782	14.690	0.644-0.855	
	RP2	0.852	37.149	0.797-0.888	
	RP3	0.775	16.837	0.657-0.844	
	RP4	0.572	4.994	0.270-0.730	
	RP5	0.599	5.059	0.278-0.756	
	OP1	0.653	5.787	0.362-0.813	
	OP2	0.759	12.240	0.604-0.849	
	OP3	0.619	6.408	0.399-0.770	
Admin Performance	ASP1	0.688	7.856	0.458-0.808	0.483
	ASP2	0.649	8.641	0.461-0.766	
	FP1	0.745	14.403	0.612-0.822	

	FP2	0.670	8.063	0.459-0.789
	IP1	0.751	12.337	0.595-0.837
	IP2	0.623	7.363	0.420-0.759
	IP3	0.741	12.826	0.594-0.831
	RIFP1	0.632	6.336	0.394-0.786
	RIFP2	0.795	19.125	0.703-0.863
	RIFP3	0.631	6.547	0.403-0.782

Table 4.3 shows convergent validity for organisational performance constructs. All the outer loadings for the indicators of the constructs were beyond the threshold 0.4, ranging from 0.531 to 0.852, and all the indicators were retained in the analysis. All t-values for all the indicators were also above 1.96 for a significance level of 5% ranging from 4.028 to 37.149, and all the outer loadings for each indicator are statistically significant. However, the AVEs for the constructs were below the threshold of 0.5, indicating less than 50% of the variance of the items explaining the construct.

Table 4.4 PLS-SEM Results Summary for Measurement Model (Process & Structure, and Awareness & Culture)

Latent variable	Indicator	Convergent Validity			
		Outer Loadings			AVE
		> .400	t>1.96	97.5%Bca CI	>.500
Process & Structure	PS1	0.647	6.358	0.371-0.783	0.586
	PS2	0.736	10.884	0.569-0.841	
	PS3	0.870	25.081	0.782-0.920	
	PS4	0.717	7.538	0.483-0.847	
	PS5	0.860	27.461	0.780-0.907	
	PS6	0.811	18.063	0.70-0.879	
	PS7	0.591	8.188	0.422-0.706	
	PS8	0.729	14.986	0.612-0.807	

	PS9	0.875	27.421	0.796-0.921	
Awareness & Culture	AC1	0.867	26.497	0.781-0.917	0.565
	AC2	0.659	6.190	0.362-0.804	
	AC3	0.714	6.722	0.425-0.840	

Table 4.4 shows convergent validity for organisational factors constructs. All the outer loadings for the indicators of the constructs were also beyond the threshold of 0.4, ranging from 0.647 to 0.875, and all the indicators were retained in the analysis. All t-values for all the indicators were also above 1.96 for a significance level of 5% ranging from 6.358 to 27.461, indicating that all the outer loadings for each indicator are statistically significant. The AVEs for all the constructs were beyond the threshold of 0.5, which indicates at least 50% of the variance of the items explaining the construct. It shows an acceptable convergent validity for the constructs.

4.5.2 Internal Consistency Reliability

Cronbach's Alpha has been used frequently to evaluate the internal consistency reliabilities in measuring items. It should be beyond 0.7 to ensure internal consistency in which a set of items measures a single latent construct. Composite reliability value is another method to assess the internal consistency reliability for each construct. Composite reliability values of 0.6 to 0.7 can be regarded as acceptable, values between 0.7 and 0.9 as satisfactory, and values above 0.90 indicate all the indicator variables are measuring the same phenomenon and can be regarded as not valid for the construct (Hair et al., 2017). Tables 4.5, 4.6 and 4.7 illustrate Cronbach's Alpha and composite reliability values of all the constructs.

Table 4.5 PLS-SEM Results Summary for Internal Consistency Reliability (Plan & Focus, Collection, Analysis, and Communication)

Latent variable	Indicator	Internal Consistency Reliability	
		Composite Reliability	Cronbach's Alpha
		> .6	> .6

Plan & Focus	PF1	0.817	0.64
	PF2		
	PF3		
Collection	CL1	0.889	0.850
	CL2		
	CL3		
	CL4		
	CL5		
	CL6		
Analysis	AL1	0.891	0.756
	AL2		
Communication	CM1		

Table 4.5 shows internal consistency reliability for CI constructs. In this study, Cronbach's Alpha for CI constructs was above the recommended threshold of 0.7, except for Plan & Focus. However, the composite reliability for all the constructs was above the recommended threshold of 0.7, ranging from 0.817 to 0.891, indicating high internal consistency reliabilities for these measurement items. The measurement instruments for communication consist of only a single item. Thus, the value for this item is 1.

Table 4.6 PLS-SEM Results Summary for Internal Consistency Reliability (Academic Performance and Administration Performance)

Latent variable	Indicator	Internal Consistency Reliability	
		Composite Reliability	Cronbach's Alpha
		> .6	> .6
Academic Performance	AP1	0.900	0.875
	AP2		
	RP1		
	RP2		
	RP3		

	RP4		
	RP5		
Admin Performance	OP1	0.903	0.880
	OP2		
	OP3		
	ASP1		
	ASP2		
	FP1		
	FP2		
	IP1		
	IP2		
	IP3		
	RIFP1		
	RIFP2		
	RIFP3		

Table 4.6 shows internal consistency reliability for organisational performance constructs. In this study, Cronbach's Alpha and composite reliability for the constructs were above the recommended threshold of 0.7. It indicates high internal consistency reliabilities for these measurement items.

Table 4.7 PLS-SEM Results Summary for Internal Consistency Reliability (Process & Structure and Awareness & Culture)

Latent variable	Indicator	Internal Consistency Reliability	
		Composite Reliability	Cronbach's Alpha
		> .6	> .6
Process & Structure	PS1	0.926	0.909
	PS2		
	PS3		
	PS4		

	PS5		
	PS6		
	PS7		
	PS8		
	PS9		
Awareness & Culture	AC1	0.793	0.607
	AC2		
	AC3		

Table 4.7 presents internal consistency reliability for organisational factor constructs. In this study, Cronbach's Alpha for the constructs was above the recommended threshold of 0.7, except for Awareness & Culture. However, the composite reliability for all the constructs was above the recommended threshold of 0.7, ranging from 0.793 to 0.926, indicating high internal consistency reliabilities for these measurement items.

4.5.3 Discriminant Validity

Discriminant validity assesses the variance of the study construct in the same model (Hair et al., 2017). The measurements for the discriminant validity are as follows:

- (i) Fornell- Larcker Criterion
- (ii) Hetrotrait-Monotrait (HTMT) ratio
- (iii) Cross-Loadings Method

4.5.4 Fornell- Larcker Criterion

For this technique, each construct's AVE should be compared to the squared inter-construct correlation of that same construct, and the shared variance for all model constructs should not be larger than their AVEs. In Table 4.8, values on the diagonal are the square root of the AVE for each construct. All the other values show the correlation between the construct. The values for the square root of the AVE of Academic, Analysis, Plan & Focus, and Communication were lower than the correlation values of other constructs. It shows that the Fornell- Larcker criterion is not met. Table 4.8 illustrates the square root of AVE for the construct for Academic, Collection, and Plan & Focus, which were lower than inter-construct correlation.

Table 4.8 Discriminant Validity with Fornell-Larcker Criterion

	Academic	Admin	Analysis	Awareness & Culture	Collection	Communication	Plan & Focus	Process & Structure
Academic	0.692							
Admin	0.842	0.695						
Analysis	0.569	0.590	0.896					
AwareCulture	0.462	0.470	0.445	0.752				
Collection	0.630	0.623	0.752	0.581	0.756			
Communication	0.461	0.423	0.434	0.539	0.617	1		
PlanFocus	0.679	0.624	0.720	0.549	0.811	0.572	0.774	
ProcesStructure	0.609	0.552	0.698	0.644	0.841	0.656	0.790	0.766

Notes: Values in italics represent the square root of AVE.

4.5.5 Hetrotrait- Monotrait (HTMT) ratio

The HTMT ratio of correlations was utilised to assess the discriminant validity (Henseler et al., 2015). There is an issue of discriminant validity if the HTMT values among the constructs are above the significant threshold of 0.9. Table 4.9 shows a high correlation between administration and academic, collection and analysis, plan and focus, analysis and collection, process and structure, as well as collection and plan & focus. Therefore, the HOC must be developed to solve the issue of discriminant validity (Hair et al., 2014).

Table 4.9 Discriminant validity with Heterotrait-Monotrait Ratio

	Academic	Admin	Analysis	Awareness & Culture	Collection	Communication	Plan & Focus
Academic							
Admin	0.949						
Analysis	0.685	0.725					
Aware & Culture	0.636	0.654	0.658				
Collection	0.723	0.718	0.926	0.813			
Communication	0.494	0.451	0.492	0.681	0.665		
Plan & Focus	0.899	0.815	0.992	0.881	1.074	0.707	
Proces & Structure	0.670	0.607	0.841	0.853	0.949	0.668	1.018

4.6 VALIDATING HIGHER ORDER CONSTRUCT

These HOCs were also validated as part of the measurement model assessment. Latent constructs scales were used to replace the LOC scales so that they could explain the variance coming from the repeated indicator approach (Hair et al., 2017). CI was the higher-order construct in the study on the four LOCs: Planning & Focus, Collection,

Analysis, and Communication. Process, Structure, Awareness, and Culture were retained as LOCs because they would involve hypothesis testing later in this study. Organisational performance was the higher-order construct of two LOCs, Academic and Administration. In order to establish the higher-order construct, the validity of outer weight, outer loading, and VIF (Variance Inflation Factor) should also be evaluated.

Table 4.10 illustrates convergent validity for HOC of CI, organisational factors, and organisational performance. All the outer loadings for CI were beyond the threshold of 0.4, ranging from 0.727 to 0.916. All t-values were also above 1.96 for a significance level of 5% ranging from 8.387 to 18.002, indicating all the outer loadings are statistically significant. LOCs for CI showed significance ($p < 0.05$) for HOC. Outer loadings for organisational performance were beyond the threshold 0.4 range from 0.958 to 0.961. Its t-values were also above 1.96 for a significance level of 5%, which indicates all the outer loadings are statistically significant. Based on the analysis, we can conclude that the convergent validity for all the HOCs was acceptable.

Furthermore, Table 4.10 also shows the significance and relevance of the relationship between the LOCs and the HOCs that were examined by analyzing the associated outer weights. All LOCs showed significance ($p < .05$) for the HOC. Planning exhibited a strong relevance (path coefficient = . 328) to the construct of CI, followed by Collection (path coefficient = . 313), analysis (path coefficient = . 287), and Communication (path coefficient = . 223). Academic performance exhibited a strong relevance (path coefficient = . 655) to the construct of organisational performance, followed by Administration performance (path coefficient = . 384). Since all criteria were met, the HOC validity was established (Hair et al., 2014).

Table 4.10 Higher Order Construct Validity

HOC	LOCs	Outer Weight	Outer Loadings	T statistics	P Values	VIF
CI	Planning & Focus	0.328	0.916	42.398	0.000	3.286
	Collection	0.313	0.932	63.387	0.000	3.967
	Analysis	0.287	0.856	31.208	0.000	2.534

	Communication	0.223	0.728	11.642	0.000	1.673
Organisational Performance	Academic Performance	0.655	0.978	25.464	0.000	3.433
	Admin Performance	0.384	0.935	22.785	0.000	3.433

Table 4.11 presents the reliability and convergent validity results for all HOCs using Cronbach's Alpha and Composite Reliability (CR), which were beyond 0.7 and AVE beyond 0.5 (Hair et al., 2014). It indicates high internal consistency reliabilities for these HOCs.

Table 4.11 Higher Order Construct Reliability and Convergent Validity

HOC	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Competitive Intelligence	0.882	0.920	0.742
Organisational Performance	0.914	0.959	0.921

Table 4.12 shows the discriminant validity for the HOCs through Fornell-Lacker, which shows that the square root of the AVE of the HOC was higher than its correlation with all other HOCs. Therefore, it can be concluded that the Fornell-Larcker criterion is met.

Table 4.12 Fornell-Lacker -Higher Order Construct Discriminant Validity

HOC	CI	Organisational Performance
Competitive Intelligence	0.862	
Organisational Performance	0.703	0.960

Table 4.13 shows the discriminant validity for the HOCs of CI and organisational performance and LOCs of organisational factors through HTMT. There was some high correlation issue between Process & Structure and CI.

Table 4.13 HTMT- Higher Order Discriminant Validity

HOC	Awareness & Culture	CI	Organisational Performance
Awareness & Culture			
Competitive Intelligence	0.655		
Organisational Performance	0.508	0.777	
Process & Structure	0.644	0.925	0.632

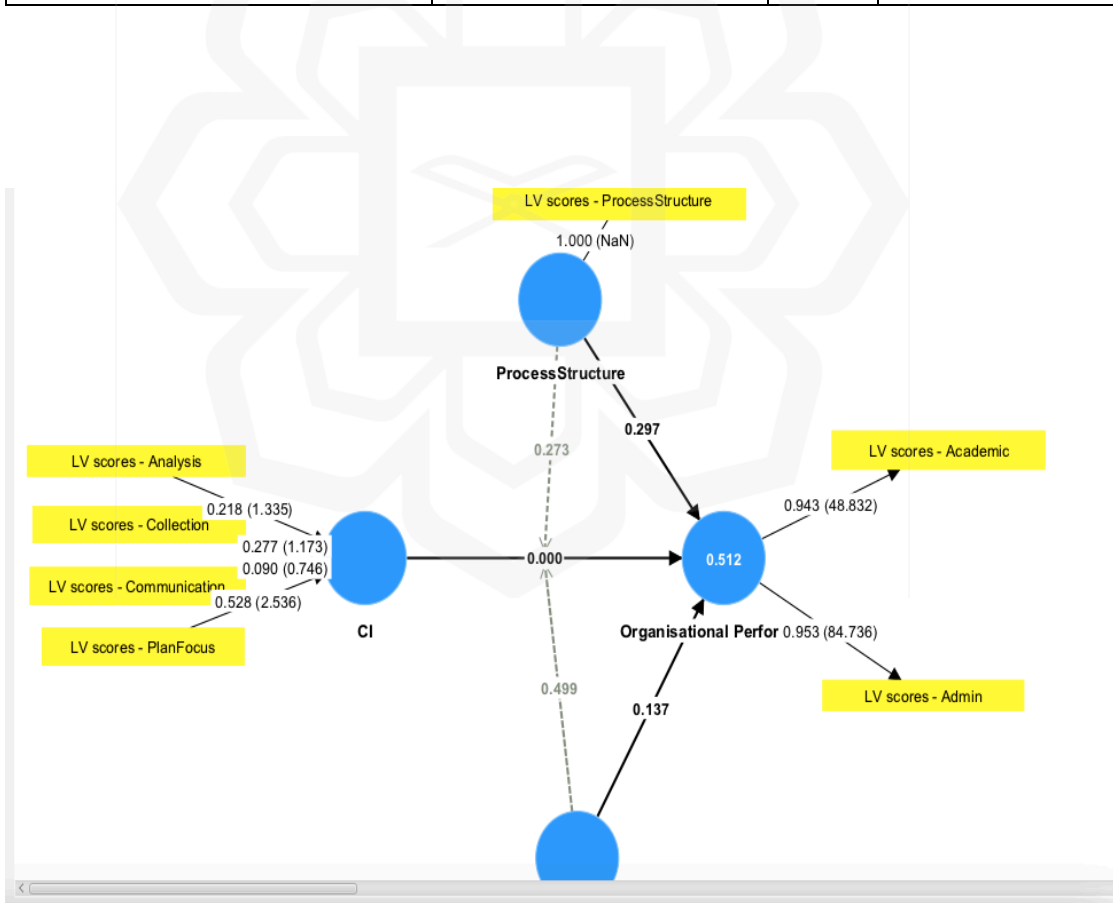


Figure 4.2 Structural model of Higher Order Construct

4.7 STRUCTURAL MODEL ANALYSIS

Structural model analysis involves the analysis of structural relationships between constructs of the study. The analysis outcomes would determine how well the data support the theory/concept and subsequently decide whether the theory/concept has been empirically confirmed (Hair et al., 2014). The structural model can be measured through the following:

- (i) Collinearity Test
- (ii) Structural Model Path Coefficients

4.7.1 Collinearity

Collinearity must be examined to ensure whether two or more constructs are not correlated. The path coefficient would be estimated accurately if collinearity among the constructs was resolved (Hair et al., 2014). Collinearity could be examined using a Variance Inflation Factor (VIF) with a cut-off point of less than 5 (Hair et al., 2014).

Table 4.14 presents the VIF values of each LOC, ranging from 1.673 to 3.967, which were lower than the cut-off point 5. It indicates that there is no issue of collinearity (Hair et al., 2014).

Table 4.14 Variance Inflation Factor (VIF)

HOC	LOCs	VIF
CI	Planning & Focus	3.286
	Collection	3.967
	Analysis	2.534
	Communication	1.673
Organisational Performance	Academic Performance	3.433
	Admin Performance	3.433

4.7.2 Structural Model Path Coefficients

It represents the hypothesised relationships among the constructs with standardised values between -1 and + 1. Path coefficients close to + 1 indicate strong positive relationships and vice versa for negative values. Estimated coefficients closer to 0 indicate a weak relationship, while very low values close to 0 are normally insignificant. The bootstrapping procedure with replacement (2000 samples) and the percentile bootstrap 95% confidence interval shows the statistical significance of the path coefficients (Hair et al., 2017).

Table 4.15 Model Fit

	HOC		LOC	
	Saturated model	Estimated model	Saturated model	Estimated model
SRMR	0.051	0.050	0.108	0.109
d_ULS	0.092	0.091	34.236	34.830
d_G	0.106	0.094	n/a	n/a
Chi-square	61.329	52.991	Infinite	Infinite
NFI	0.897	0.911	n/a	n/a

Table 4.15 explains the assessment of the proposed research model through the Standardised Root Mean Square Residuals (SRMR). SRMR shows the discrepancy between the observed correlations and the research model implied correlations and a value below 0.08 indicates a good fit (Hair et al., 2017). The value of SRMR for LOC in this study was 0.108, while HOC was 0.051, indicating that the model fit was acceptable (Hair et al., 2017). Furthermore, the Normed Fit Index (NFI) for HOC 0.911, which is near 1.0, also indicates a strong model fit for this study (Bentler & Bonett, 1980; Bentler, 1990).

4.8 HYPOTHESIS TESTING

Note that p-values and t-values are used to test the significance of the structural model. This study uses a two-tailed test with a significance test of $P < .001$ and a t-value of at least 1.96 to examine the structural model. Four hypotheses were developed in this study based on three research objectives and research questions. Research Objectives (RO), Research Questions (RQ), and hypotheses have been detailed as follows:

RO1: To investigate the extent of the CI process in IHL in Malaysia. RQ1: To what extent is the CI process in the IHL in Malaysia? Hypothesis 1 (H1) represented RO1 and RQ1 statement.

H1: The CI process or practice in IHL in Malaysia consists of four stages: (1) Planning & focus, (2) Collection, (3) Analysis, and (5) Communication.

RO2: To investigate the effect of CI on the organisational performance of IHL. RQ2: What is the effect of CI on the organisational performance of higher learning institutions in Malaysia? Hypothesis 2 (H2) represented RO2 and RQ2 statement.

H2: CI has a significant effect on the organisational performance of IHL.

RO3: To examine the moderating effect of organisational factors on the relationship between CI and organisational performance of IHL in Malaysia. RQ3: Do organisational factors moderate the relationship between CI and organisational performance of IHL in Malaysia? Hypothesis 3 (H3) and 4 (H4) represented RO3 and RQ3 statement.

H3: Process and Structure will moderate the relationship between CI and the organisational performance of the IHL in Malaysia.

H4: Awareness and culture will moderate the relationship between CI and the organisational performance of the IHL in Malaysia.

Hypothesis for RQ1

H1: The CI process or practice in institutions of higher learning in Malaysia consists of four stages: (1) Planning & focus, (2) Collection, (3) Analysis, and (5) Communication.

For the CI Process (CIP) constructs, four individual factors emerged through CFA SEM PLS 4 as cross-loadings of the individual indicators exceeded the indicators of other constructs. This finding also supports other CI and intelligence research discovering more than three factors in the CI process or practice (Freyn, 2017; Dishman & Calof, 2008). Thus, the CIP was discovered to have four constructs, and the hypothesis was supported. The four stages of CI would be a guideline for CI practitioners to properly evaluate information and produce quality intelligence for the decision-makers in the organisation. It would, later on, determine the performance of the organisation. A summary of the cross-loadings is illustrated in Table 4.16.

Table 4.16 reported the results of cross-loadings, and each item was strongly related to their corresponding constructs, which are all above 0.7, ranging from 0.718 to 0.916.

Table 4.16 Summary of Cross Loadings Output Using SmartPLS 4 (44 indicators)

Construct	Item	Academic	Admin	Analysis	Awareness Culture	Collect	Comm	Planning	Process Structure
Planning	PF1	0.531	0.49	0.396	0.46	0.578	0.455	0.724	0.658
	PF2	0.434	0.549	0.689	0.462	0.678	0.402	0.834	0.685
	PF3	0.487	0.502	0.563	0.358	0.624	0.48	0.761	0.496
Collection	CL1	0.501	0.493	0.603	0.448	0.78	0.455	0.672	0.572
	CL2	0.464	0.475	0.537	0.568	0.726	0.585	0.608	0.683
	CL3	0.348	0.454	0.47	0.368	0.739	0.417	0.619	0.619
	CL4	0.449	0.504	0.652	0.407	0.787	0.414	0.652	0.676
	CL5	0.315	0.423	0.543	0.298	0.727	0.308	0.488	0.463
	CL6	0.562	0.559	0.594	0.529	0.774	0.6	0.625	0.781

Construct	Item	Academic	Admin	Analysis	Awareness Culture	Collect	Comm	Planning	Process Structure
Analysis	AL1	0.457	0.549	0.916	0.42	0.743	0.442	0.717	0.637
	AL2	0.491	0.535	0.876	0.375	0.593	0.326	0.561	0.614
Communication	CM1	0.439	0.439	0.434	0.539	0.617	1	0.572	0.656

4.9 DIRECT EFFECT

The structural model is evaluated by identifying the path coefficient, significant level, and relevant effects. This study established only one direct effect to determine whether CI significantly impacts organisational performance.

H2: CI has a significant effect on the organisational performance (OP) of IHL.

H2 evaluates whether CI has a significant impact on OP. The results revealed that the coefficient between CI and OP is high at $\beta = 0.724$, with a t-value of 4.73 and p-value at .000). This indicates a strong effect and statistically significant relationship between CI and OP. Thus, H2 was supported. CI is a systematic and comprehensive practice that produces intelligence as a result of identifying all the requirements and needs of the stakeholders. If done properly, the organization's performance will be in jeopardy.

Table 4.17 reported the results of the path coefficient relationship of CI with organisational performance and the hypothesised moderating effect of awareness & culture and process & structure on the relationship between CI and organisational performance. Only the relationship between CI and organisational performance on the proposed paths is statistically significant at the 5% significant level.

Table 4.17 Structural Model for HOC

Path Coefficient (HOC)	Original sample (O)	T statistics (O /STDEVI)	P values
Awareness Culture -> Organisational Performance	0.093	0.977	0.329
CI -> Organisational Performance	0.724	4.73	0
Process Structure -> Organisational Performance	-0.106	0.625	0.532
Awareness Culture x CI -> Organisational Performance	-0.015	0.121	0.904
Process Structure x CI -> Organisational Performance	-0.033	0.341	0.733

4.10 MODERATING EFFECT

The study further includes moderation effects of process & structure and awareness & culture in the link between competitive intelligence and organisational performance. Information about the p-value should be supported with percentile at 95% confidence intervals.

H3: Process & Structure will moderate the relationship between CI and the organisational performance of higher learning institutions in Malaysia.

H3 evaluates whether process & structure moderate the relationship between CI and the organisational performance of the IHL in Malaysia. The results discovered that the coefficient between the indirect effect CI and OP is at ($\beta = -0.033$, with a t-value of 4.73 and p-value at .000. The results revealed that process & structure negatively moderate the relationship between CI and OP. Thus, H3 was not supported.

H4: Awareness & Culture will moderate the relationship between CI and the organisational performance of the IHL in Malaysia.

H4 evaluates whether awareness and culture moderate the relationship between CI and the organisational performance of the IHL in Malaysia. The results discovered that the coefficient between the indirect effect CI and OP is at $(\beta = -0.015$, with a t-value of 0.121 and a p-value of .904. The results revealed that awareness and culture negatively affect the relationship between CI and OP. Thus, H4 was not supported.

Based on the results, we could concur that it is sufficient for the organisation to focus on strengthening the CI process. There is no need for any moderating constructs to influence organisational performance as CI itself is already systematic and comprehensive if used as it is.

Table 4.18 presents constructs items that have been adapted from literature and adapted to the study. All the items for HOC CI and LOC process & structure and awareness & culture are measured using a 5-point Likert scale with 5 “Strongly agree” and 1 “Strongly disagree”. Items for HOC organisational performance are measured using a 5-point Likert scale with 5 “Always” and 1 “Never”.

Table 4.18 Final Measurement of Model Construct

HOC	LOC	Item	Survey Question
CI	Planning	PF1	We are concerned about the plan and intentions of our key competitors, alliances, suppliers, distributors, and other stakeholders.
		PF2	Our organization produces intelligence reports and assessments on emerging technologies that we believe are the most important.

HOC	LOC	Item	Survey Question
		PF3	We meet with senior managers to identify their intelligence requirements/needs.
	Collection	CL1	Our employees report information about our competitors in foreign markets to the right manager for decision-making.
CI		CL2	Our organization has a variety of methods for collecting information (e.g., Trade shows, websites, industry reports, etc.).
		CL3	We evaluate the reliability of our sources of information (e.g., persons, publications, internet, etc.).
		CL4	We train/prepare our employees about what information they should look for before they go to trade shows, exhibitions, conventions, etc.
	Construct	Item	Survey Question
CI	Collection	CL5	Results from exit interviews/job interviews are used in our intelligence system.
		CL6	We maintain a comprehensive map or inventory of internal information and knowledge.
	Analysis	AL1	Our organization develops profiles on emerging technologies to better understand their characteristics, potential applications, and market advantages.

HOC	LOC	Item	Survey Question
		AL2	We use information management tools (e.g., data mining, data warehousing, OLAP, or ,Business intelligence software) to understand our customers.
	Communication	CM1	Our intelligence findings are widely distributed within the organization.
	Awareness & Culture	AC1	Our organization recognizes CI as a necessary activity for business.
		AC2	Most employees understand what competitive intelligence is.
		AC3	Competitive intelligence can be used to create competitive advantage.
	Process & Structure	PS1	Our organization has an incentive to encourage employees to report their competitive observations and information.
		PS2	Competitive intelligence is a formal activity in our organization.
		PS3	There is a central coordination point for receiving competitive intelligence information.
		PS4	We have a formal knowledge/information management system.
		PS5	We have a long-term competitive intelligence plan.
		PS6	We report our intelligence findings to the top management.
	Construct	Item	Survey Question

HOC	LOC	Item	Survey Question
	Process & Structure	PS7	We conduct an internal audit knowledge (e.g., identify and catalogue what people know, what report they have published, etc.).
		PS8	Top management uses CI results in their strategic planning and decision-making.
		PS9	Our organization maintains a central record of reliable sources of information.
Organisational Performance	Academic Performance	AP1	Our institution believes the best work is currently taking place in research and teaching within the field of expertise for academic reputation.
		AP2	Our institution believes in small class sizes and good individual supervision for faculty-to-staff ratio.
		RP1	Our institution believes in research impact and produces publications that attract citations.
		RP2	Our institution believes in research impact and has research groups that are highly recognised.
		RP3	Our institution has improved the impact of research by promoting technological development, such as patents.
		RP4	Our institution observed frequent winning of Nobel prizes and field medals by members of staff.
		RP5	Our institution observed frequent winning of Nobel prizes and field medals by members of alumni.
	Admin Performance	OP1	Our institution produces the best graduates for employment.

HOC	LOC	Item	Survey Question
		OP2	Our institution offers a wide variety of continuing education courses that consider the needs of different members of the public.
	Construct	Item	Survey Question
	Admin Performance	OP3	Our institution offers consultation services and training to the government, private firms, and other societies.
		IP1	Our institution has a high international mobility of teachers and students making use of inter-institutional elements.
		IP2	Our institution believes in attracting students from other nations with high ratios.
		IP3	Our institution believes in providing incentives that attract academics from other nations for a good international faculty ratio.
		RFIP1	Our institution has adequate resources for operations.
		RFIP2	Our institution has excellent academic support services such as books and databases in the library, laboratories, and technological resources.
		RFIP3	Our institution has an infrastructure with high-quality facilities.
		FP1	Our institution frequently gets research income in the form of a grant through our staff members.

HOC	LOC	Item	Survey Question
		FP2	Our institution has diversified its revenue (e.g., co-financed and funded research, extension services, and stock exchanges).
		ASP1	Our institution's brand is highly positioned.
		ASP2	Key decision makers are surveyed/interviewed to verify that the intelligence products produced for them satisfy their needs.

4.11 ASSESSING THE MODEL'S EXPLANATORY POWER

The model's explanatory power assessment examines the Coefficient of Determination (R^2) and Cohen's Effect Size (f^2). R^2 values indicate substantial in-sample predictive power that measures the proposed research model's explanatory power (Hair et al., 2021). It represents the variance explained in each of the endogenous constructs. R^2 values of 0.75, 0.50, and 0.25 can be considered substantial, moderate, and weak (Hair et al., 2021). In this study, the proposed research model explains 50.11% (R^2) of the variance of organisational performance that can be considered moderate.

The model's quality is measured by calculating Cohen f^2 values, indicating the relative impact of an exogenous construct on the endogenous construct (Henseler et al., 2009). Values of 0.02, 0.15, and 0.35 indicate a weak, medium, or large f^2 . Table 4.19 presents the f^2 of the relationship between CI and organisational performance, which is medium f^2 , while there is no f^2 for Awareness & Culture and Process & Structure.

Table 4.19 Effect Size Analysis

Hypothesised relationship	f^2 value	Effect size
---------------------------	-------------	-------------

Awareness & Culture ----> Organisational performance	0.012	No
CI ---> Organisational performance	0.250	Medium
Process & Structure ---> Organisational performance	0.002	No

4.12 ASSESSING THE MODEL'S PREDICTIVE POWER

This procedure involves the assessment of Q^2 statistics and also out-of-sample predictive assessment. A model's predictive power indicates the ability of a model to predict new or future observations. If the Q^2 values are below 0, the model shows poor predictive relevance (Hair et al., 2021). PLSpredict is a technique used to estimate the model on a training sample and evaluate its predictive performance on a holdout sample (Shmueli et al., 2019). It only focuses on the model's key endogenous constructs and does not involve assessing prediction errors for the indicators of all endogenous constructs (Hair et al., 2021).

In this procedure, PLS-SEM Root Mean Square Error (RMSE) or Mean Absolute Error (MAE) values must be compared with the naïve Linear regression Model (LM) benchmark to determine the model's predictive power. The interpretation of the degree of the model's predictive power is based on the following guidelines:

- (i) The model has high predictive power if all indicators in PLS-SEM analysis have lower RMSE or MAE values compared to the naïve LM benchmark;
- (ii) The model has medium predictive power if the majority of indicators in PLS-SEM analysis have smaller prediction errors compared to the LM;
- (iii) The model has low predictive power if a minority of the dependent construct's indicators in PLS-SEM analysis have lower prediction errors compared to the LM; and

- (iv) The model lacks predictive power if none of the indicators in the PLS-SEM analysis yields lower prediction errors in terms of the RMSE or MAE.

Table 4.20 presents that 40 endogenous indicators in PLS-SEM analysis have smaller prediction errors compared to the LM. Thus, we can conclude that the model has a medium predictive power.

Table 4.20 Model Predictive Power for LOCs Indicators

No	Indicator	Q ² predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
1	AP1	0.231	0.828	0.622	0.948	0.683
2	AP2	-0.006	0.831	0.62	0.886	0.681
3	OP1	0.157	0.773	0.582	0.831	0.647
4	OP2	0.261	0.713	0.564	0.798	0.622
5	OP3	0.168	0.785	0.61	0.955	0.734
6	RP1	0.166	0.844	0.685	1.034	0.808
7	RP2	0.235	0.876	0.701	1.041	0.844
8	RP3	0.192	0.86	0.689	1.051	0.811
9	RP4	0.052	1.035	0.824	1.179	0.936
10	RP5	0.11	0.942	0.729	1.162	0.901
11	ASP1	0.054	0.796	0.637	0.963	0.804
12	ASP2	0.269	0.707	0.541	0.78	0.595
13	FP1	0.133	1.047	0.838	1.163	0.923
14	FP2	0.125	0.933	0.714	1.172	0.902
15	IP1	0.115	0.961	0.769	1.199	0.917
16	IP2	0.104	0.839	0.66	0.976	0.782
17	IP3	0.069	0.829	0.63	0.944	0.759
18	RFIP1	0.232	0.815	0.614	1.077	0.8
19	RFIP2	0.229	0.721	0.558	0.822	0.664
20	RFIP3	0.137	0.812	0.644	0.985	0.802

No	Indicator	Q ² predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
21	AL1	0.652	0.61	0.476	0	0
22	AL2	0.432	0.85	0.704	0	0
23	CL1	0.535	0.737	0.564	0	0
24	CL2	0.464	0.743	0.594	0	0
25	CL3	0.43	0.748	0.571	0	0
26	CL4	0.524	0.807	0.638	0	0
27	CL5	0.338	0.925	0.744	0	0
28	CL6	0.509	0.695	0.531	0	0
29	CM1	0.419	0.794	0.613	0	0
30	PF1	0.441	0.694	0.537	0	0
31	PF2	0.662	0.608	0.468	0	0
32	PF3	0.53	0.759	0.577	0	0
33	AP1	0.23	0.828	0.622	0.948	0.683
34	AP2	-0.004	0.83	0.618	0.886	0.681
35	ASP1	0.054	0.796	0.638	0.963	0.804
36	ASP2	0.271	0.706	0.535	0.78	0.595
37	FP1	0.133	1.047	0.839	1.163	0.923
38	FP2	0.126	0.933	0.715	1.172	0.902
39	IP1	0.116	0.96	0.769	1.199	0.917
40	IP2	0.103	0.839	0.66	0.976	0.782
41	IP3	0.073	0.827	0.628	0.944	0.759
42	OP1	0.156	0.774	0.583	0.831	0.647
43	OP2	0.259	0.714	0.565	0.798	0.622
44	OP3	0.166	0.786	0.612	0.955	0.734
45	RFIP1	0.227	0.817	0.615	1.077	0.8
46	RFIP2	0.223	0.723	0.56	0.822	0.664
47	RFIP3	0.138	0.811	0.644	0.985	0.802
48	RP1	0.165	0.845	0.685	1.034	0.808
49	RP2	0.235	0.876	0.701	1.041	0.844
50	RP3	0.188	0.862	0.69	1.051	0.811
51	RP4	0.05	1.035	0.825	1.179	0.936

No	Indicator	Q ² predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
52	RP5	0.106	0.944	0.73	1.162	0.901

4.13 COMMON METHOD BIAS

Harman's single-factor test was used to test common method variance (Zhou, 2012). It showed that the larger factor explains 38.9% of the total variance. Thus, there is no single since the percentage is less than 50%, affirming there is no common bias in the collected data.

4.14 OBSERVED HETEROGENEITY ASSESSMENT

Heterogeneity can be classified into observed and unobserved. Observed heterogeneity refers to the difference between two or more data groups related to observable characteristics such as gender, age, or country of origin. In contrast, in unobserved heterogeneity, the differences between two or more data groups do not depend on specific observable characteristics or combinations of several characteristics. (Hair et al., 2016). It is important to identify heterogeneity to avoid biased results and false and misleading conclusions (Sarsted et al., 2017). The researcher may proceed with analysing the data in a single model on an aggregate level if the unobserved heterogeneity does not affect the results (Hair et al., 2017).

This procedure involves identifying a number of segments to be extracted from the data using latent class analysis. Latent class analysis combines measurement invariance assessment and multigroup analysis in a recurring process (Sarsted et al., 2017). The minimum sample size required must be computed prior to estimating each segment. The structural model shows three arrows pointing at the endogenous construct and assumes an effect size of 0.15 and a power level of 80%, suggesting that the minimum sample size requirement is 37. This allows for a maximum of 3 segments.

Each observation will be assigned to a separate segment based on the FIMIX-PLS membership probabilities. Segmentation solution depends on the smaller value of certain information criteria such as Akaike's Information Criterion (AIC), modified AIC with Factor 3 (AIC3), Consistent AIC (CAIC) and Bayesian Information Criterion (BIC) (Sarsted et al., 2017). AIC determines the maximum number of segments, while MDL5 determines the minimum number. Table 4.21 shows that AIC indicates a 3-segment solution, whereas CAIC points to a one-segment solution. AIC4 and BIC generally perform well when determining the number of segments in FIMIX-PLS. Both criteria indicate a one-segment solution (Sarstedt et al., 2011). Therefore, we assume that unobserved heterogeneity is not at a critical level, which supports the results of the entire data set's analysis.

Table 4.21 FIMIX PLS Performance Criteria

	Segment 1	Segment 2	Segment 3
AIC (Akaike's information criterion)	207.473	192.778	197.351
AIC3 (modified AIC with Factor 3)	213.473	205.778	217.351
AIC4 (modified AIC with Factor 4)	219.473	218.778	237.351
BIC (Bayesian information criterion)	222.604	225.561	247.787
CAIC (Consistent AIC)	228.604	238.561	267.787
HQ (Hannan-Quinn criterion)	213.58	206.009	217.707
MDL5 (Minimum Description Length with Factor 5)	331.127	460.694	609.53
LnL (LogLikelihood)	-97.737	-83.389	-78.676
EN (Normed Entropy Statistic)	0	0.82	0.587
NFI (Non-Fuzzy Index)	0	0.831	0.597
NEC (Normalized Entropy Criterion)	0	16.597	37.951

Table 4.21 indicates that the segment determination should be based on the combination of AIC3 and CAIC/BIC or AIC4 and BIC. EN that is higher than 0.5 will

be another alternative to determine the number of segments if there is no combination, as stated earlier (Hair et al., 2015).

4.15 MEASUREMENT INVARIANCE OF COMPOSITE MODEL (MICOM)

Measurement invariance, also known as measurement equivalence, refers to group differences in model estimates that do not result from the variable's different interpretations or distinctive meanings across groups. It involves configural invariance, compositional invariance, and equality of composite mean values and variance (Henseler et al., 2016). Configural invariance tests ensure identical indicators, data treatment, and algorithm setting/criteria. The compositional invariance test ensures the original correlation is greater than equal to the adjusted quantile (Cheah, Amaro & Roldan, 2023).

The multigroup analysis is invalid if configural and compositional invariance does not support measurement invariance. Full measurement invariance is confirmed if both configural and compositional invariance are confirmed (Hair et al., 2017). Standardised path coefficient estimates can also be compared between the composite across the group after establishing the configural and compositional invariance (Henseler et al., 2015). The absence of measurement invariance can also reduce statistical test power, influencing the precision estimators and producing misleading results (Hair et al., 2017).

4.16 MULTIGROUP ANALYSIS

In the final research, a Measurement Invariance of Composite Models (MICOM) invariance procedure was conducted by age, gender, position in the organisation, and education level. Table 4.22 shows the measurement model by gender and age group of 28-37 years old, which was fully invariant, exhibiting configural invariance, invariance through equity of means, and invariance through equity of variance based on the p-value > 0.05 . Multigroup analysis on the pooled data level to determine the standardised

coefficient of the structural model can be compared across the group (Henseler et al., 2016).

However, this model was not fully invariant by position and education level, which failed to meet configural invariance, invariance through equity of means, and invariance through equity of variance based on the p -value > 0.05 . Therefore, a multigroup analysis on the pooled data level could not be executed (Henseler et al., 2016).



Table 4.22 Permutation Group Analysis

Demographic	HOC	Compositional			Equity of Means			Equity of variance			Full measurement invariance established
		Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
Gender	Awareness Culture	1.000	1.000	0.165	-0.446	0.458	0.466	-0.867	0.848	0.096	Yes
	Competitive Intelligence	0.957	0.739	0.775	-0.460	0.445	0.363	-0.841	0.744	0.279	Yes
	Organisational Performance	1.000	0.998	0.891	-0.476	0.408	0.445	-0.977	0.926	0.322	Yes
	Process Structure	1.000	1.000	0.831	-0.494	0.447	0.382	-0.812	0.776	0.254	Yes
Age	HOC	Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
28-37 & 38-47 (Age 2 & 3)	Awareness Culture	1.000	1.000	0.165	-0.491	0.445	0.197	-0.929	0.961	0.203	Yes
	Competitive Intelligence	0.957	0.739	0.775	-0.470	0.469	0.256	-0.667	0.671	0.313	Yes
	Organisational Performance	1.000	0.998	0.891	-0.454	0.432	0.315	-0.565	0.555	0.268	Yes
	Process Structure	1.000	1.000	0.831	-0.473	0.441	0.468	-0.667	0.687	0.487	Yes
28-37 & 48-57 (Age 2 & 4)	Awareness Culture	1.000	1.000	0.451	-0.446	0.458	0.466	-0.867	0.848	0.096	Yes
	Competitive Intelligence	0.540	0.535	0.052	-0.460	0.445	0.363	-0.841	0.744	0.279	Yes
	Organisational Performance	0.998	0.986	0.419	-0.476	0.408	0.445	-0.977	0.926	0.322	Yes

Demographic	HOC	Compositional			Equity of Means			Equity of variance			Full measurement invariance established
		Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
	ProcessStructure	1.000	1.000	0.029	-0.494	0.447	0.382	-0.812	0.776	0.254	No
38-47& 48-57 (Age 3 & 4)	AwarenessCulture	1.000	1.000	0.253	-0.427	0.446	0.235	-0.921	0.994	0.442	Yes
	Competitive Intelligence	0.745	0.669	0.137	-0.414	0.445	0.203	-0.606	0.689	0.152	Yes
	Organisational Performance	0.999	0.996	0.239	-0.397	0.409	0.282	-0.923	0.959	0.191	Yes
	ProcessStructure	1.000	1.000	0.000	-0.429	0.445	0.406	-0.732	0.818	0.261	No
Position	HOC	Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
Top Management & Senior Management	AwarenessCulture	1.000	1.000	0.062	-0.446	0.382	0.103	-0.798	0.858	0.379	Yes
	Competitive Intelligence	0.635	0.700	0.019	-0.407	0.388	0.007	-0.549	0.548	0.451	No
	Organisational Performance	0.997	0.996	0.108	-0.406	0.419	0.026	-0.499	0.486	0.189	No
	ProcessStructure	1.000	1.000	0.563	-0.392	0.400	0.039	-0.644	0.708	0.441	No
Top Management & Middle Management	AwarenessCulture	1.000	1.000	0.226	-0.442	0.439	0.018	-0.947	1.063	0.463	No
	Competitive Intelligence	0.861	0.665	0.434	-0.440	0.440	0.089	-0.666	0.734	0.396	Yes
	Organisational Performance	1.000	0.996	0.560	-0.442	0.447	0.065	-1.055	1.093	0.343	Yes
	Process Structure	1.000	1.000	0.000	-0.444	0.447	0.028	-0.755	0.859	0.377	No

Demographic	HOC	Compositional			Equity of Means			Equity of variance			Full measurement invariance established
		Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
Senior Management & Middle Management	Awareness Culture	1.000	1.000	0.000	-0.438	0.462	0.100	-0.835	0.898	0.326	No
	Competitive Intelligence	0.909	0.745	0.483	-0.442	0.424	0.481	-0.716	0.809	0.473	Yes
	Organisational Performance	0.999	0.998	0.217	-0.446	0.469	0.458	-0.946	0.939	0.400	Yes
	Process Structure	1.000	1.000	0.542	-0.432	0.426	0.369	-0.676	0.770	0.445	Yes
Education	HOC	Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
Doctoral & Master	Awareness Culture	1.000	1.000	0.012	-0.450	0.450	0.126	-1.046	0.944	0.199	No
	Competitive Intelligence	0.849	0.702	0.323	-0.453	0.425	0.120	-0.668	0.606	0.341	Yes
	Organisational Performance	1.000	0.995	0.577	-0.442	0.443	0.103	-0.918	0.878	0.200	Yes
	Process Structure	1.000	1.000	0.000	-0.456	0.414	0.281	-0.767	0.673	0.307	No
Doctoral & Bachelor	Awareness Culture	1.000	1.000	0.876	-0.482	0.437	0.479	-1.239	1.194	0.189	Yes
	Competitive Intelligence	0.884	0.701	0.472	-0.469	0.453	0.144	-0.949	0.868	0.440	Yes
	Organisational Performance	1.000	0.999	0.902	-0.515	0.437	0.418	-1.091	1.086	0.187	Yes
	Process Structure	1.000	1.000	0.000	-0.485	0.447	0.060	-1.038	0.914	0.082	No
Master & Bachelor	Awareness Culture	1.000	1.000	0.000	-0.426	0.447	0.063	-0.537	0.608	0.394	No

Demographic	HOC	Compositional			Equity of Means			Equity of variance			Full measurement invariance established
		Original correlation	5.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	5.0%	95.0%	Permutation p-value	
	Competitive Intelligence	0.863	0.700	0.376	-0.406	0.417	0.007	-0.547	0.585	0.279	No
	Organisational Performance	1.000	0.995	0.586	-0.398	0.412	0.030	-0.481	0.563	0.181	No
	ProcessStructure	1.000	1.000	0.000	-0.430	0.388	0.006	-0.661	0.720	0.127	No



4.17 BOOTSTRAP MULTIGROUP ANALYSIS (MGA)

Multigroup analysis based on gender and age group of 28-37 years old was performed to assess whether there are differences across gender and age group of 28-37 years old in the relationship between CI on the organisational performance, the moderating effect of awareness and culture and process and structure on the organisational performance. The calculations were executed using a bootstrap of 1,000 samples with a significant p-value of 5%. A p-value < 0.05 confirms that there are differences in the above-mentioned groups.

Table 4.23 presents the results of MGA analysis using Henseller's MGA and permutation test. The results indicate insignificant differences across gender and age groups of 28-37 years old in the relationship between CI on the organisational performance, awareness, and culture on the organisational performance and process and structure on the organisational performance, exhibited by its p-value > 0.05.

Table 4.23 Bootstrap MGA

Gender	Difference (Female - Male)	One-tailed (Female vs Male) p-value	Two-tailed (Female vs Male) p-value
Awareness Culture -> Organisational Performance	-0.120	0.695	0.305
Competitive Intelligence -> Organisational Performance	-0.283	0.871	0.129
Process Structure -> Organisational Performance	0.505	0.051	0.051
Awareness Culture x Competitive Intelligence -> Organisational Performance	-0.110	0.647	0.353

Process Structure x Competitive Intelligence -> Organisational Performance	0.311	0.125	0.125
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Table 4.24 Bootstrap Analysis (Age)

Age	Difference (Age_2 - Age_3) (28-37 & 38-47)	Difference (Age_2 - Age_4) (28-37 & 48-57)	1-tailed (Age_2 vs Age_3) p-value	1-tailed (Age_2 vs Age_4) p-value	2-tailed (Age_2 vs Age_3) p-value	2-tailed (Age_2 vs Age_4) p-value
AwarenessCulture -> Organisational Performance	-0.387	-0.076	0.883	0.557	0.117	0.443
Competitive Intelligence -> Organisational Performance	-0.232	-0.218	0.688	0.697	0.312	0.303
ProcessStructure -> Organisational Performance	0.537	0.438	0.106	0.146	0.106	0.146
AwarenessCulture x Competitive Intelligence -> Organisational Performance	0.105	-0.234	0.365	0.736	0.365	0.264
ProcessStructure x Competitive Intelligence -> Organisational Performance	0.030	0.103	0.486	0.411	0.486	0.411

4.18 SUMMARY

4.18.1 Competitive Intelligence (CI) Constructs

For RQ 1, what is the extent of the CI process or activities in the institutions of higher learning in Malaysia? The finding discovered that the CI process or activities consist of four constructs, namely Planning & Focus, Collection, Analysis, and Communication. The analysed data was indicated by the factor loading of each construct, which was above 0.7. Thus, H1 is supported.

Competitive Intelligence and Organisational Performance of Institutions of Higher Learning in Malaysia

For RQ 2, CI positively affected the organisational performance of IHL in Malaysia ($\beta = 0.724$, with a t-value of 4.73 and p-value at .000). For this research question, the hypothesis was supported.

Moderating Effect of Process & Structure between CI and Organisational Performance

For RQ 3, Process & Structure negatively affect the relationship between CI and OP ($\beta = -0.033$, with a t-value of 4.73 and p-value at .000). Thus, H3 was not supported.

The moderating effect of Awareness & Culture between CI and Organisational Performance

Awareness & Culture negatively moderate the relationship between CI and OP ($\beta = -0.015$, with a t-value of 0.121 and p-value at .904). Thus, H4 was not supported.

4.18.2 Theoretical implications

- (1) This study deepens and extends resource-based theory and knowledge-based theory in exploring the effect of CI on the organisational performance of higher learning institutions in Malaysia.
The findings add new models or theories to existing theories on factors relating to organisational performance. These findings guide other researchers in doing empirical research on the organisational performance of higher learning institutions in Malaysia.
- (2) The study also provides empirical evidence of the moderating role of process and structure and awareness and culture on the relationship between CI and organisational performance of IHL in Malaysia. The theoretical implication also expands the growing body of literature linking the CI process/practice, process and structure, awareness, and culture with organisational performance of IHL in Malaysia.

4.18.3 Practical Implications

The present research findings have significant management implications. CI practitioners or individuals in IHL in Malaysia who formulate strategic planning must ensure that information gathered from internal or external sources is transformed into effective and quality intelligence for decision-making. CI provides a systematic procedure for the generation of intelligence. Each procedure must be fulfilled to ensure quality and effective intelligence can be produced and communicated to the decision-makers.

- (1) This study provides guidelines for IHL to understand the advantage of CI on organisational performance.
- (2) This study also guides IHL to understand the role of organisational factors such as Process & Structure and Awareness & Culture in moderating the relationship between CI and organisational performance.

- (3) This study also gives guidelines for the IHL in Malaysia to identify their performance indicators.



CHAPTER FIVE

DISCUSSION AND CONCLUSION

This chapter evaluates the research findings on the extent of Competitive Intelligence (CI) in the institutional of higher learning in Malaysia as well as the impact of Competitive Intelligence (CI) on the organisational performance of institutions of higher learning (IHLs) in Malaysia. The study also hypothesised that organisational factors moderate the relationship between Competitive Intelligence (CI) and organisational performance. By establishing the theoretical foundations, the chapter highlights key research gaps, reviews relevant literature and outlines the constructs and hypotheses that support the study's conceptual framework.

The primary objective of this study is to examine the extent of CI process in institutions of higher learning (IHL) in Malaysia and its impact on organisational performance. Additionally, the study investigates the moderating role of organisational factors including process, structure, awareness and culture in the relationship between Competitive Intelligence (CI) and organisational performance. The findings aim to offer insights into how Malaysian IHLs can leverage CI to achieve sustainable competitive advantage and enhance their performance in the rapidly evolving higher education sector.

A review of the literature has identified several critical research gaps regarding the application of CI in Institutions of Higher Learning (IHLs) in Malaysia. First, there is a limited number of studies examining the impact of CI on the organisational performance of IHLs in Malaysia, leaving a significant gap in understanding its potential benefits. Second, the absence of a structured university-wide assessment process for the collection, analysis, and dissemination of competitive information has resulted in ineffective intelligence practices which negatively affect organisational performance. Finally, there is a need for further research into organisational factors such as process, structure, awareness and culture which could significantly affect the success of CI.

This study is motivated by the critical role that IHLs play in driving knowledge creation, economic growth and societal development. However, many IHLs face challenges in fully harnessing the potential of CI to enhance their organisational performance. This underscores the need to develop a conceptual model that examines the constructs of CI, their impact on organisational performance and the moderating role of organisational factors. The proposed conceptual model is underpinned by the Resource-Based View (RBV) and Knowledge-Based View (KBV) which posit that resources such as knowledge, data, CI and human capital are valuable, rare and difficult to imitate. By effectively leveraging CI and investing in human capital, IHLs can achieve a sustainable competitive advantage and enhance their organisational performance.

Competitive intelligence is recognised as a critical strategic tool that enable IHLs to collect, analyse and utilise internal and external information such as market trends, competitor activities, regulatory changes and technological advancements. By leveraging CI, IHLs can improve their strategic planning, enhance decision making and boost organisational performance. Through the application of CI, IHLs gain deeper understanding of industry dynamics and emerging opportunities. This strategic approach allows organisations anticipate changes in the higher education landscape, predict shifts in student preferences and benchmark their performance against competitors. By doing so, IHLs can offer improved academic programmes, streamline operations and enhanced their competitiveness.

Despite its strategic importance, the effective application of CI in IHLs in Malaysian faces several significant challenges. The most critical of these challenges include a lack of understanding the CI concept, limited access to relevant data financial constraints, inadequate support from top management, and shortage of CI experts. These challenges underscore the urgent need for IHLs to develop robust CI capabilities, implement systematic CI processes and foster a culture of intelligence-driven decision making. By addressing these issues, IHLs can enhance their ability to proactively respond to changes in the external environment.

The literature further emphasises the critical role of organisational factors in strengthening the relationship between CI and organisational performance. Key factors

such as process, structure, awareness and culture play an integral role in enhancing CI's effectiveness. By establishing these elements, IHLs can drive strategic foresight, enable evidence based decision making and ensure alignment with industry best practices.

This study aims to develop and test a model of competitive intelligence (CI) and its construct to assess their impact on the organisational performance of IHLs in Malaysia. The study's key contributions are threefold: (1) highlighting the positive impact of CI on IHLs performance, (2) identifying the moderating role of organisational factors, and (3) providing practical recommendations for IHLs to overcome barriers and improve CI adoption. This integrated approach equips Malaysian IHLs to excel in an increasingly dynamic and competitive higher education landscape.

Competitive intelligence (CI) has the potential to assist Institutions of Higher Learning (IHLs) in Malaysia in improving their performance in the highly competitive higher education sector. Both CI and organisational performance have been areas of ongoing interest for researchers, practitioners and IHLs administrators. However, the application of CI within IHLs has been inconsistent with some institutions struggling to understand, adopt and implement effective CI processes. This gap in the application of CI limits the ability of IHLs to make informed decisions that could enhance their competitiveness. Effective decision-making is closely linked to the quality of intelligence produced by CI. When CI is leveraged correctly, it provides valuable insights that inform strategic planning, resource allocation, policy development, directly affecting the performance of the institutions.

Moreover, the integration of CI into the decision making process enables IHLs to proactively identify emerging trends, address weaknesses and exploit new opportunities allowing them to stay ahead of competitors and maintain their viability in the higher education sector. Therefore, the ability to generate high quality CI is not only an organisational advantage but also a critical driver of sustained growth and innovation within the sector. This study, therefore seeks to fill gap by examining the relationship between CI and organisational performance in Malaysian IHLs, providing valuable insights into how CI can be strategically applied to improve outcomes in this sector.

5.1 SUMMARY OF RESEARCH OBJECTIVES AND FINDINGS

Based on a thorough analysis of the results presented in the preceding chapter, the proposed objectives of this research have been successfully achieved, providing significant insights into the role of competitive intelligence (CI) in enhancing organisational performance. Out of the four hypothesised relationships, two (Hypotheses 1 and 2) are strongly supported, confirming the relevance of the proposed constructs and their direct impact on organisational outcomes. However, Hypotheses 3 and 4 were not significantly supported, indicating that further investigation is needed to explore the complexities of these relationships.

The results derived from the Partial Least Squares-Structural Equation Modelling (PLS-SEM) confirm the significance of the first two objectives, highlighting the critical constructs of CI and their relevance to IHLs. Specifically, the first objective reveals four constructs of competitive intelligence: Plan & Focus, Collection, Analysis, and Communication. These constructs form the foundation of an effective CI process within IHLs, each contributing to the strategic decision making processes that ultimately drive improved organisational performance. By systematically examining these key constructs, this research offers valuable insights that can guide the enhancement of CI capabilities. Such advancement are instrumental in fostering more effective and informed decision making processes, which ultimately strengthening the strategic positioning and operational efficiency of Malaysian IHLs.

The second objective demonstrates that CI has a significant and positive impact on organisational performance. CI as established in this study is a vital instrument for IHLs in Malaysia to generate distinctive intelligence that drives their overall performance. By effectively leveraging CI, IHLs can gain actionable insights into their competitive landscape, anticipate industry trends and make informed decisions that contribute to achieving strategic goals. This finding underscore the importance of developing robust CI capabilities as a core organisational competency especially in the highly competitive higher education sector. CI equips IHLs with the ability and tools to adapt and navigate to external changes, optimise resource allocation and enhance institutional efficiency which are essential for maintaining relevance and sustainability in a rapidly evolving educational environment.

The third objective of this study examines whether organisational factors, specifically Process & Structure and Awareness & Culture moderate the relationship between CI and organisational performance of institutions of higher learning in Malaysia. It was anticipated that these factors would moderate the relationship between CI and organisational performance of insitutions of higher learning in Malaysia. However, the findings reveal that these factors had a significantly negative effect on this relationship meaning they did not enhance the relationship as expected.

RO1: To investigate the extent of the CI process/practice in higher learning institutions in Malaysia.

The first objective of this research is to investigate the extent of the CI process or practice in institutions of higher learning in Malaysia specifically focusing on the core CI constructs that drive these practices. The findings of this study align with previous literature on CI which underscores the importance of structured intelligence processes within organisations (Montgomery & Weinberg, 1979; Viviers et al., 2002; Dishman & Calof, 2008; Freyn, 2017; Robles et al., 2019; Cavallo et al., 2021). Using Confirmatory Factor Analysis (CFA), four distinct CI constructs were identified, each with factor loadings > 0.7 (Hair et al., 2014). These constucts specifically, Plan & Focus, Collection, Analysis, and Communication form the foundational elements of CI process. The identification of these constructs as central to the CI supports the argument that a systematic and structured approach to CI is crucial for fostering informed decision making and maintaining competitive advantage in educational settings. As a result, Hypothesis 1, which posited the existence of these four constructs was supported.

According to the intelligence cycle, the Plan & Focus stage is the first and most crucial step as it established the foundation for effective decision making. This stage determines the type of information decision makers require which directly impacts the success of all subsequent CI stage. Proper execution during this stage is critical as it integrating multiple perspectives and identifying key areas focus such as corporate or business strategy, sales or business development, market entry, product development, research or technology development, mergers and acquisitions, due diligence, joint venture assessment, reputation management, public relations and regulatory or legal

matters (Calof, Arcos & Sewdass, 2020). Regular meetings enable organisations to clearly identify decision makers' needs and their intelligence requirement but also determining the necessary resources required to collect relevant and actionable data (Maungwa & Laughton, 2023). Additionally, the purpose and results of the intelligence process were also established in this stage (Freyn, 2017).

Focus refers to identifying the specific and accurate information needed by the decision-maker. Once prioritised, relevant information can be easily collected and aligned toward a more effective solution (Madureira et. al., 2023). However, many organisations failed to identify and did not focus on crucial information, such as data on competitors, customers, government, technological, suppliers, partners, universities, professional associations, and other research institutions (Calof, Arcos & Sewdass, 2020; Mohd Asri & Abdul Samad, 2024). This oversight particularly if it involves critical information at a specified point of time can jeopardise the performance of their organisation (Calof, Arcos & Sewdass, 2020; Madureira et al., 2021; Maungwa & Laughton, 2023).

Collection is the second stage of CI and plays a pivotal role in ensuring high quality information. At this stage, the organisation must be dynamic, proactive, and flexible when searching for the source of information which can come from internal or external sources. Primary sources such as interviews, surveys, company websites, publications, commercial databases, customers, company employees, internal databases, industry experts, trade shows/conferences, social media, suppliers, associations, government employees, and patents (Maungwa & Laughton, 2024; Heras-Rosas & Herrera, 2021; Calof, Arcos & Sewdass, 2020) provide direct information. Secondary sources including analyst reports, financial statements and online materials offer second hand information. These varied sources are essential for creating a complete and accurate dataset for analysis (Maungwa & Laughton, 2024). It is important to verify and vet the reliability and relevance of source of information. In today's highly competitive market, organisations must remain vigilant against disinformation which can disrupt the collection process and the time frame for collecting information should be dictated by the decision-makers to ensure it is timely and reflective of the current environment (Madureira et al., 2023).

Analysis is the third stage of CI that will determine the quality of intelligence, which is the core product of CI. Various techniques such as competitor analysis, SWOT analysis, benchmarking, and industry analysis can be applied individually or combined to transform information into actionable intelligence effectively (Bose, 2008; Calof, Arcos & Sewdass, 2020). Additionally, data analytics has proven to guide decision-making and help organisations gain deeper understanding of their markets and customers (Calof, Arcos & Sewdass, 2020). The choice of analysis techniques depends on the organisation's strategic objectives and capabilities. This analysis can be performed by internal specialists or outsourced to external professional. Moreover, establishing a clear time frame for the analysis to ensure timely delivery of useful intelligence to decision-makers (Maugwa & Laughton, 2023).

Communication is the fourth stage of CI that provides real-time intelligence to the decision-maker for faster decision-making. A well-designed communication medium and robust infrastructure should be established to facilitate the rapid and efficient delivery of intelligence to decision makers. Conventional methods such as emails, presentations, briefings, printed reports, and the use of the latest technology can be utilised to communicate intelligence effectively. Regular interaction with decision makers and gathering their feedback allows for adjustments to align CI outcomes with their specific needs which enhancing the relevance and value of the final results (Bose, 2008). Additionally, organisations should also develop centralised databases to store and provide easy access to critical information, knowledge and intelligence for decision-makers (Calof, Arcos & Sewdass, 2020).

In this study, among the four constructs, Plan & Focus had the strongest effect on CI (0.38), followed by Collection (0.313), Analysis (0.287), and Communication (0.223). It shows that Plan & Focus and Communication were the main focus of institutions of higher learning compared to the rest of the stages. Combination of both constructs enhances the relevance, clarity and practicality of competitive intelligence by initiating an ongoing process in which well defined objectives steer intelligence efforts and efficient dissemination ensures these efforts lead to meaningful and impactful outcomes.

In summary, these four constructs provide a comprehensive framework for understanding the role of competitive intelligence (CI) in enhancing the performance of Malaysian IHLs. Institutions must address diverse challenges while aligning with Malaysia's education policies such as the Malaysia Education Blueprint. By systematically applying these constructs, IHLs can foster a culture of intelligence driven decision making, thereby improving their ability to navigate the increasingly competitive higher education sector. This approach enables institutions to address key institutional goals such as enhancing academic offerings, attracting both domestic and international students, boosting research excellence, strengthening global competitiveness, fostering industry collaborations, ensuring financial sustainability and improving institutional efficiency. This research not only confirms the significance of these constructs but also underscores the urgent need for IHLs to develop and refine their CI processes to achieve sustainable growth and maintain a competitive advantage.

RO2: To investigate the impact of CI on the organisational performance of IHL

This study examines the impact of CI on the organisational performance of institutions of higher learning in Malaysia. The finding clearly indicate that CI positively affects the performance of these institutions. Therefore, the assumption H2 is supported.

Institutions of higher learning in Malaysia should strengthen CI within their organisations. CI is a comprehensive and systematic process that generates actionable intelligence. The universal definition of CI, as proposed by Pellisier & Nenzhelele (2013), is also aligned with the strategic intelligence cycle introduced by Montgomery & Weinberg (1979). Both studies agreed that establishing CI constructs that consist of plan & focus, collection, analysis, and communication could produce actionable intelligence which is crucial for the decision-maker seeking to improve organisational performance. Thus, we conclude that the CI as an internal organisational resource contributes to improved performance by generating intelligence.

The impact of CI on organisational performance is undeniable. However, CI remains relatively new in businesses, particularly in small and medium-sized enterprises (SMEs) and education sector where there is often lack of stable infrastructure or sufficient knowledge for implementing CI systems (Heras-Rosas &

Herrera, 2021). Both sectors face similar challenges especially in navigating market uncertainty (Garcia-Alsina et al., 2016). Furthermore, studies on the impact of CI on performance are scarce in higher education compared to for-profit organisations (Garcia-Alsina et al., 2016).

CI determines the performance of the organisation. From the literature, CI had a very significant effect on the performance of companies. CI had been shown to improve innovation performance, sales volume, market share and profitability, revenue and return on investment while reducing business costs (Cappel & Boon, 1995; Teo & Choo, 2001; Hamid, 2018; Calof & Sewdass, 2020). It also contributed to sustainable growth of the enterprise (Stefanikova, Rypakova & Moravcikova, 2015) return on investment, return on sales (Irenaus, Ikechukwu & Ndubuisi, 2022), small and medium enterprise (SME) export performance (Isichei, Nnia, Emmanuel, Igwe, Ibe & Peterside, 2023), customer loyalty and satisfaction and competitive position (Asri & Samad, 2024). Ultimately, organisational performance is closely tied to the quality of actionable intelligence provided by CI (Alshammakh & Azmin, 2021).

Each IHLs has unique performance indicators strategically aligned with its foundational purpose. This findings identified that the organisational performance of institutions of higher learning was divided into academic and administrative performance. This finding concurred with the study discovered by Gough & Scott (2008). In addition, this study also extended the research by Abu Bakar et al. (2018) and Hernandez et al. (2020) on the items included in performance indicators of institutions of higher learning.

In this study, academic performance indicators comprise academic and research. The findings show that academic performance (0.655) had the strongest effect on organisational performance, followed by administration performance (0.384), while administration performance indicators comprise outreach, internationalisation, infrastructure, financial and assessment. It was found that CI has a significant direct effect on the organisational performance of institutions of higher learning and an indirect effect on the academic and administration performance of institutions of higher learning.

RO3: To examine the moderating effect of organisational factors on CI towards the organisational performance of IHL in Malaysia.

Many studies conducted earlier on CI had focused on the importance of organisational factors such as process and structure and awareness and culture for the effectiveness of CI in the organisation (Viviers et al., 2002; Saayman et al., 2008; Calof & Dishman, 2008; Freyn 2017). The findings of their studies discovered that process, structure, awareness, and culture had a significant effect on the effectiveness of CI. However, in this study, organisational factors such as process and structure, as well as awareness and culture, have no significant moderating effect on the relationship between CI and organisational performance.

a) Process and Structure

Establishing a new process and practice within the organisation requires well-defined policies and procedures to ensure its effectiveness. Appropriate policies and procedures for the operation of CI should be in place to provide clear direction, guidelines, and mandate across the entire organisation, thereby contributing to the effectiveness of CI. These policies should include incentives for individuals who report competitive observations and information. Additionally, the purpose of CI and identification of the end user of intelligence findings should be clearly stated by the organisation (Viviers et al., 2002; Saayman et al., 2008; Madureira, Popovic & Castelli, 2023b).

Well-coordinated CI requires the establishment of appropriate infrastructure to effectively use CI in the organisation. This infrastructure can be set up either formally or informally. Key elements include identifying centralised units to receive competitive intelligence information, formalising CI processes within the organisation, implementing a formal knowledge/information management system, establishing IT infrastructure and technological forecasting capabilities and conducting frequent internal knowledge audits. These factors collectively contribute to the effectiveness of CI within the organisation (Viviers et al., 2002; Saayman et al., 2008; Khalid, 2023; Madureira, Popovic & Castelli, 2023b).

b) Awareness and Culture

The entire organisation should have a clear knowledge and understanding of CI and its potential contribution to improve organisational performance. The establishment of CI will be ineffective if the entire organisation does not fully recognise its role in creating a competitive advantage. It is essential for all members of the organisation to be aware of the importance CI especially in the highly competitive higher education sector. Thus, the organisation must take responsibility for promoting and spreading appropriate organisational awareness of CI through various communication platforms to ensure its significance is understood across all levels (Viviers et al., 2002; Saayman et al., 2008; Mohd Asri & Abd Mohsin, 2020).

Organisational culture is integral to achieving an organisation's mission and vision. Embedding a culture of competitiveness and CI in the organisation is pivotal for the effective utilisation of CI. At its core, CI involves managing information within the organisation with a strong emphasis on information sharing. CI can be truly effective when all member of the organisation instill an information-sharing culture and intelligence driven culture (Viviers et al., 2002; Saayman et al., 2008; Mohd Asri & Abd Mohsin, 2020; Madureira, Popovic & Castelli, 2023b). Every individual will act as an agent actively observing, collecting, and filtering important information about the market environment and sharing relevant information with the designated CI unit for further analysis. Furthermore, a culture of competition also significantly enhances the use of CI, as it encourages individuals in the organisation to continuously strive to excel and innovate, which is beneficial to the organisation.

In summary, while organisational factors such as Process & Structure and Awareness & Culture can enhance the effectiveness of CI but in this study it was found that they are not absolute prerequisites for CI to positively contribute to organisational performance.

5.1.1 Recapitulation of the Main Findings from the PLS-SEM Analysis

To recap, this study aimed to investigate the extent of the CI process/practice in institutions of higher learning in Malaysia from the perspective of the strategic intelligence cycle. Additionally, based on the literature, a research model is also developed to examine the impact of CI on the organisational performance of IHLs in Malaysia as well as the moderating effects of process & structure and awareness & culture on the relationship between CI and organisational performance from the perspective of RBV and KBV. The research model includes four constructs with 44 indicators.

This research involved middle-level, senior-level, and top-level management of institutions of higher learning (IHLs) in Malaysia with a total of 92 valid responses collected and analysed. SEM-PLS 4.0 software was used to assess both the measurement and structural models as well as to test the hypotheses. The results are as follows:

- (1) CI was found to consist of four constructs: Plan and Focus, Collection, Analysis, and Communication;
- (2) CI has a significant effect on the organisational performance of IHLs in Malaysia;
- (3) Process, structure, awareness, and culture had no significant moderating effect on the relationship between CI and the organisational performance of IHLs in Malaysia.
- (4) Organisational performance of institutions in Malaysia can be divided into two sub-constructs: academic performance and administration performance.

5.1.2 Connection Between the Findings and the Research Questions or Hypotheses

H1: The CI process or practice in IHL in Malaysia consists of four stages: (1) Plan & Focus, (2) Collection, (3) Analysis, and (5) Communication.

The first research objective developed in this study hypothesised that CI consists of four constructs. Based on the measurement and structural models, CI was identified as having four constructs, and the hypothesis was supported. The study's findings are consistent with those of previous studies conducted by Calof & Dishman (2002) and Madureira et al., (2021) on CI constructs which also identified CI as consisting of four constructs. As a cyclical framework, CI constructs ensure continuous monitoring, analysis and refinement of organisational strategies, supporting proactive strategies and ensuring timely responses which are crucial in the rapidly evolving higher education environments. Furthermore, these findings are consistent with the Strategic Intelligence Cycle developed by Montgomery and Weinberg (1979), as well as studies by Calof & Breakspear (1999) in Canada, Viviers et al. (2002) in South Africa.

However, Bartes (2013) and Maungwa & Laughton (2023) proposed dividing the analysis stage into information processing and storing and intelligence analysis of information. A structured and systematic intelligence cycle which adds value to the analysed information, produced effective intelligence (Strauss & Du Toit, 2010; Bartes, 2013). All stages of CI are interrelated with the output of each stage is the input of the other stage (Bartes, 2013). The continuous nature of four CI constructs helps institutions of higher learning in Malaysia to build and sustain a competitive advantage by constantly analysing both external factors and internal capabilities. It also provides comprehensive view of the internal and external factors that would impact decision making and foster long term sustainability, risk mitigation and continuous improvement. This result indicates that institutions of higher learning in Malaysia incorporate all four CI constructs to produce effective intelligence for the decision-making.

H2: There is a significant effect of CI on the organisational performance of higher learning institutions in Malaysia.

This study proposed that CI would directly affect the performance of IHL in Malaysia, including academic and administration performance. The data analysis showed that there was a significant and positive relationship between CI and organisational performance. In this study, organisational performance for IHL in Malaysia was divided into academic and administration performance as proposed by Gough & Scott (200), Abu Bakar et al. (2018), and refined by Hernandez-Diaz et al., 2020. The findings align with studies conducted by Hanif, Arshed & Farid (2022) and Adidam, Banerjee & Shukla (2012).

The result showed that CI is a stand-alone systematic, comprehensive, and dynamic process. It is the ideal practice for IHLs facing uncertainty and a highly competitive environment similar to for-profit organisations (Garcia-Alsina et al., 2013). CI produces crucial intelligence for strategy development and decision making which may directly affect the performance of the organisation (Maluleka & Chummun, 2023).

CI is always associated with strategic formulation and development. A structured and well-defined CI is crucial to be integrated into strategic planning (Maluleka & Chummun, 2023) to ensure the sustainability of the organisations performance of in a Volatile, Uncertain, Complex, and Ambiguous (VUCA), dynamic, and turbulent world (Madureira, Popovic & Castelli, 2023) and ensure CI effectiveness (Khalid, 2023).

This finding shows that the organisational performance of IHL in Malaysia would be directly affected by CI. This finding aligns with the RBV theory and its subset KBV theory. In KBV theory, CI produces distinctive intelligence that contributes to higher value creation which is pivotal for sustaining a competitive advantage and improving organisational performance (Madureira, Popovic & Castelli, 2023). CI serves a strategic management tool that enables institutions of higher learning in Malaysia to achieve sustainable performance due to its dynamic and comprehensive nature. This, in turn, leads to sustainable competitive advantage, which is consistent with the principles of both RBV and KBV theories.

H3: Process & Structure will moderate the relationship between CI and the organisational performance of higher learning institutions in Malaysia.

Process & structure were expected to moderate the relationship between CI and organisational performance of the institutions of higher learning in Malaysia. This study has shown otherwise, as the process and structure negatively affect the relationship between CI and the organisational performance of the institutions of higher learning in Malaysia.

In this study, Process & structure did not contribute to the effectiveness of CI in improving the organisational performance of the IHL in Malaysia as CI has not been formalised in the organisations. The top management did not always use CI results in their strategic planning and decision-making, internal audit knowledge was not frequently conducted and unavailability of a long-term CI plan in the organisation. This study contrasts with another study by Waithaka (2016) and Mohd Asri & Abdul Mohsin that discovered organisational structure had significantly moderated the relationship between CI and firm performance.

Failure to assign a department or individual in charge of managing both formal and informal CI led to ineffective CI that would be detrimental to the organisational performance (Tsitoura & Stephens, 2012; Koseoglu, Chan, Okumus & Altin, 2019). This study's formal or informal structure did not strengthen the relationship between CI and organisational performance. Financial constraints, especially for small and medium-sized companies, and inadequate personnel to deal with CI contributed to CI's ineffectiveness (Yap, Zabid & Sapuan, 2013; Calof, 2020). Furthermore, only a few Malaysian companies have included the CI function in their organisation for more than 5 years, and CI in most companies is still in the infancy stage (Du Toit & Sewdass, 2014; Akram & Azmin, 2021).

Introducing incentives in the policies could ensure full support from the entire organisation. However, in this study, incentives were unavailable to encourage employees to report their observations and information. Thus, it did not contribute to the relationship between CI and the organisational performance of institutions of higher learning in Malaysia, as shown by the data collected and analysed. This conclusion

contrasts with the study findings of Saayman et al. (2008) and Koseoglu, Ross & Okumus (2016). As CI deals more with managing information, the organisation should aggressively reward incentives to the individuals in the organisation to perform CI.

H4: Awareness & Culture will moderate the relationship between CI and the organisational performance of the IHL in Malaysia.

This study found that awareness and culture negatively affect the relationship between CI and the organisational performance of the IHL in Malaysia. These factors did not strengthen the relationship between CI and the organisational performance which contrast with the conclusions of previous studies by Viviers, Saayman & Muller (2005), Du Toit & Sewdass (2014), Maungwa (2017), Calof (2020), and Madureira, Popovic & Castelli (2021) which suggested that awareness and culture moderated the relationship between competitive intelligence and organisational performance. These earlier studies identified barriers such as lack of awareness regarding the use of competitive intelligence (CI) in decision-making, enhancing competitiveness and the purpose of CI itself. Such factors hinder organizations from effectively implementing CI. Nevertheless, IHLs in Malaysia realised that CI is essential to create a competitive advantage for their institutions.

Information-sharing culture could not strengthen the relationship between CI and organisational performance. The disintegration of sharing of information needs, information was not shared according to the needs and preferences of senior management and not according to the organisational goals and mission, and mutual distrust among employees were found to be the main reason for such situation (Cekuls, 2015; Maungwa, 2017; Maungwa & Fourie, 2018). This study is similar to that conducted by Seyyed-Amiri, Shirkavand, Chalak & Rezaeei (2017), who discovered that information sharing had the lowest effect on creating a competitive advantage. Thus, key intelligence needs could not be refined and articulated to affect organisational operations and strategies (Maungwa & Fourie, 2018).

Bonding with other organisational members contributes to the knowledge or information-sharing culture. However, bonding based on regulations or non-voluntarily factors is so fragile that they decelerate knowledge or information sharing in the organisation and impede its performance. In contrast, creating a networked organisation contributes to the success of information sharing among the organisation's members, which directly boosts the quality and performance of the university faster and easier (Trigo, Gouveia, Quoniam & Riccio, 2007; Luu, 2014). Table 5.1 provides a summary of the results from the hypotheses testing.

Table 5.1 Summarising of Results of Hypotheses Testing

Hypotheses	Direction of the effect	Justification of the desired hypothesis
H1: The CI process or practice in institutions of higher learning in Malaysia consists of four stages: (1) Planning & focus, (2) Collection, (3) Analysis, and (5) Communication.	N/A	Results of cross-loadings and each item were strongly related to their corresponding constructs, all above 0.7 ranging from 0.718 to 0.916. Thus, the CI process or practice was identified as having four constructs, and the hypothesis was supported.
H2: There is a significant effect of CI on the organisational performance of higher learning institutions in Malaysia.	+	The results revealed that the coefficient between CI and OP is high at $\beta = 0.724$, with a t-value of 4.73 and p-value at .000). This indicates a strong effect and statistically significant relationship between CI and OP. Thus, H2 was supported.
H3: Process and Structure will moderate the relationship between CI and the organisational performance of higher learning institutions in Malaysia.	-	The results discovered that the coefficient between the indirect effect CI and OP is at ($= -0.033$, with a t-value of 4.73 and p-value at .000). The results revealed that process & structure negatively moderate the relationship between CI and OP. Thus, H3 was not supported.

<p>H4: Awareness and culture will moderate the relationship between CI and the organisational performance of the IHL in Malaysia.</p>	<p>-</p>	<p>The results discovered that the coefficient between the indirect effect CI and OP is at (= -0.015, with a t-value of 0.121 and a p-value of .904. The results revealed that awareness and culture negatively affect the relationship between CI and OP. Thus, H4 was not supported.</p>
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Figure 5.1 depicts the research framework with hypotheses that outlines the relationships between Competitive Intelligence (CI) and organizational performance, hypotheses H1 until H4). Plan & Focus, Collection, Analysis, and Communication factors (**Hypothesis H1**) collectively influence CI.

The Competitive Intelligence (CI) is the central element in the framework that links CI (Plan & Focus, Collection, Analysis, and Communication) to organizational performance. The hypothesis H2 indicates that CI directly influences organizational performance. **Process & Structure (Hypothesis H3), Awareness & Culture (H4)** represent the contextual factors that can impact CI. The hypothesis H3 "Process & Structure" influences CI, while hypothesis H4 "Awareness & Culture" also affects CI. Both elements point towards how CI operates within an organization, influencing its overall performance.

As for the **Organizational Performance (Academic and Administrative Performance)**, the framework shows that CI impacts overall organizational performance. This Figure 5.1 sets the stage for testing how these factors (plan, collection, analysis, and communication) and the organizational context (process, structure, awareness, and culture) influence competitive intelligence, which in turn affects organizational performance in both academic and administrative areas.

5.2 RESEARCH Model

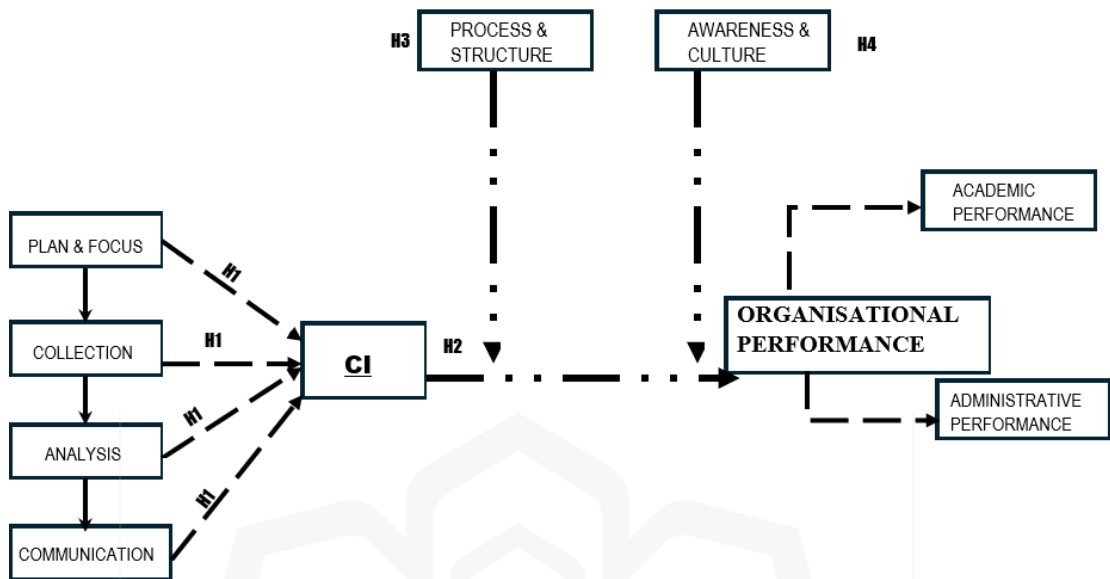


Figure 5.1 Research Framework with hypotheses

Figure 5.2 shows the final structural model with hypotheses. This figure represents the final structural model with hypotheses and depicts the relationships between different components of the study, specifically focusing on the impact of the competitive intelligence factors and organizational context on Competitive Intelligence (CI), which ultimately influences **Organizational Performance**.

Key factors and relationships

First, the Competitive Intelligence Factors (Plan & Focus, Collection, Analysis, and Communication) are all interconnected. The model indicates that all these factors are **supported** by the data (as denoted by "H1 - Supported"). This means that each of these factors contributes to CI and that the hypotheses relating to these factors are valid, implying that effective planning, collection, analysis, and communication all play significant roles in facilitating CI.

Second, **Competitive Intelligence (CI)**. CI is the central element in this framework, influenced by the previous factors in the competitive intelligence process. The hypothesis (H2) linking CI to **Organizational Performance** is **supported**,

suggesting that **CI** has a significant positive impact on improving the overall performance of an organization. **CI** is seen as a crucial variable that directly influences both **academic performance** and **administrative performance** in the organizational context.

Third, **Process & Structure**. The relationship between **Process & Structure** and **CI** (H3) is **not supported** in this model. This indicates that the organizational structure and internal processes, contrary to expectations, do not have a direct positive impact on **CI** in this specific study. The dotted line labeled “Not Supported” indicates that even though **Process & Structure** was hypothesized to influence **CI**, the data does not back this connection.

Fourth, **Awareness & Culture**. Similarly, **Awareness & Culture** (H4) is **not supported**, meaning that the anticipated relationship between the awareness of sustainable practices and organizational culture, and their impact on **CI**, is not substantiated by the data. This result implies that increasing organizational awareness and shaping culture may not necessarily drive **CI** in the way initially expected.

Fifth, **Organizational Performance**. The final outcome of **CI** is the improvement of **Organizational Performance**, which is measured in terms of **academic** and **administrative performance**. The connection between **CI** and **Organizational Performance** (H2) is **supported**, indicating that **CI** directly affects the organization's overall performance, enhancing both academic and administrative outcomes.

Sixth, **Academic and Administrative Performance**. The model also highlights that improvements in **CI** are associated with better **academic** and **administrative performance**. This suggests that the implementation of **CI** strategies can lead to improvements in organizational efficiency and productivity in these areas.

Indeed, the competitive intelligence process (planning, collection, analysis, and communication) is supported as influencing **CI**. **CI** positively influences **Organizational Performance**. **Process & Structure** and **Awareness & Culture** do not directly support **CI**, suggesting that other factors may be more influential in driving

continuous improvement. The outcomes related to **academic performance** and **administrative performance** show that improvements in **CI** contribute to better organizational outcomes.

In short, the final structural model reveals that the research process is key to driving **Competitive Intelligence** within organizations, but the organizational context, in terms of structure and culture, may not have the expected influence. This information is vital for understanding how **CI** can be leveraged to improve performance across academic and administrative domains.

5.3 FINAL RESEARCH MODEL

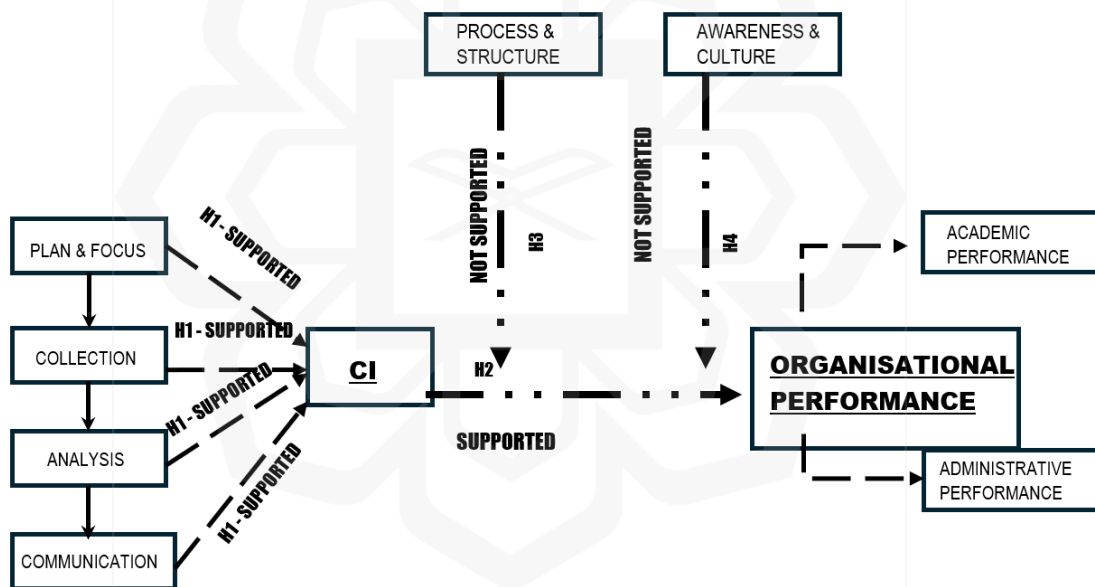


Figure 5.2 Final Structural Model with Hypotheses Results

5.4 CONTRIBUTION TO KNOWLEDGE

5.4.1 Identification of the Key Contributions Made by the Study

The results of this study contribute to the existing body of literature by providing valuable insights into the significance of the relationship between **CI** and organisational

performance, particularly in the context of Institutions of Higher Learning (IHLs) in Malaysia. This study emphasises that CI can generate effective intelligence upon completion of the CI process which includes Plan & Focus, collection, analysis, and communication. The data analysis for this quantitative study confirmed and added to the existing body of knowledge.

No prior studies have specifically examined the relationship between CI and organisational performance of IHL in Malaysia nor examining the extent of CI practice in these institutions. Existing research on CI in Malaysia had primarily focused on publicly listed companies, government-links companies, manufacturers, and hotels (Wahab & Othman, 2006; Yap & Rashid, 2011; Yap, Zabid & Sapuan, 2013; Du Toit & Sewdass, 2014; Alshammakh & Amin, 2022).

The study also explored whether organisational factors such as process, structure, culture, and awareness moderated the relationship between CI and organisational performance. Organisational performance was examined based on the sub-constructs proposed by Gough and Scott (2008). The main purpose of this study is also to determine whether it is worth it for the organisation to invest in CI to improve its performance.

The study engaged all IHLs in Malaysia with 92 institutions responding to the self-administered questionnaires. Furthermore, this study expands on the RBV and KBV theories in emphasising the role of internal resources, specifically the creation of distinctive intelligence in determining organisational performance. However, this study found that no full moderation relationship exists between process and structure and organisational performance as well as between awareness and culture and organisational performance.

5.4.2 Explanation of How the Findings Fill Gaps in the Existing Literature

This study addresses gaps in the existing literature by empirically investigating whether CI has an impact on the organisational performance of institutions of higher learning (IHLs) in Malaysia specifically through the generation of effective intelligence.

Additionally, it investigates the extent of CI process/practice in institutions of higher learning in Malaysia. Furthermore, this study examines the moderating effect of organisational factors such as process, structure, awareness, and culture on the relationship between CI and organisational performance of institutions of higher learning in Malaysia.

A survey study was conducted to examine the relationship between CI and organisational performance. The findings confirmed a significant and positive impact of CI on the performance of institutions of higher learning in Malaysia. However, organisational factors such as process and structure did not moderate the relationship between CI and the organisational performance of these institutions.

The study's findings provide valuable insights for CI practitioners in today's competitive higher education industry. While the effect of CI on organisational performance is well documented in developed nations, the existing literature on this topic in developing nations is limited. Therefore, the empirical results of this study contribute to the existing literature by supporting the role of CI in institutions of higher learning in Malaysia.

In conclusion, this study suggests that institutions of higher learning in Malaysia can achieve outstanding organisational performance by effectively implementing the CI process. It also provides a better understanding of how CI relates to organisational performance. Furthermore, this study can also help CI practitioners or those involved in strategic planning to gain clearer understanding of how the completion of the four CI constructs impacts organisational performance.

5.4.3 Discussion of the Theoretical and Practical Implications of the Research

5.4.3.1 Theoretical Implications

This study contributes to the existing body of competitive intelligence (CI) literature by utilising a complete and systematic CI process. The Resource-Based View (RBV), Knowledge-Based View (KBV), and CI frameworks, which complement each other,

were integrated in this study. These theories provide a comprehensive lens through which to understand the role of competitive intelligence in enhancing organisational performance. By combining these perspectives, the study highlights the strategic value of CI and its impact on sustaining competitive advantage and improving organisational success.

Furthermore, this study examined the impact of CI on the organisational performance of institutions of higher learning in Malaysia, a topic that had been studied by only a few researchers (Liu & Oppenheim, 2006; Garcia-Alsina et al., 2013; Garcia-Alsina et al., 2016). Theoretically, this research extends the understanding of CI by contextualising it within the unique setting of higher education in Malaysia. It refines existing theoretical models by demonstrating how CI when systematically applied can directly impact organisational strategies, decision making processes and overall performance.

The integration of RBV and KBV in this study is particularly significant. RBV suggests that organisations can achieve sustained competitive advantage by effectively utilising their internal resources and CI serves as a strategic resource that enhances an organisation's ability to analyse and respond to external competitive forces. On the other hand, the KBV emphasises the role of knowledge as a valuable asset for decision making and innovation. This study highlights how CI processes such as information collection, analysis and dissemination are integral to enhancing an institution's knowledge base which in turn drives performance improvements.

This study's theoretical implications also extend to the strategic management of institutions of higher learning. It positions CI as an essential strategic tool that informs decision making at both operational and strategic levels. The theoretical framework developed in this study offers insights into how institutions can better utilise CI to navigate the increasingly competitive higher education landscape. By linking CI to organisational performance, this study provides a nuanced perspective on how information when managed effectively becomes a strategic asset that enhances organisational outcomes.

Additionally, the study advances the literature by proposing a model that links CI to organisational performance thereby providing a theoretical foundation for future research in the field. This model contributes to the broader field of strategic management by offering a clear framework for understanding how CI can be leveraged to improve performance in both competitive and academic contexts.

CI offers a comprehensive procedure for managing information. While organisations and researchers have primarily concentrated on acquiring and analysing information, there has been insufficient attention to defining essential procedures for managing information, such as collecting, classifying, and storing it to generate actionable intelligence (Garcia-Alsina et al., 2016). This study addresses this gap by offering a more structured approach to CI processes.

Moreover, CI offers significant advantages to institutions of higher learning in Malaysia contributing to sustainable organisational performance. By adopting CI, these institutions can proactively respond to the highly competitive higher education sector. This study advances the literature on institutions of higher learning by highlighting the impact of CI on organisational performance. Additionally, this study develops an integrated model to test CI's effect on organisational performance. From a strategic and corporate management perspective, CI serves as a critical tool for scanning and analysing the external environment enabling more effective decision-making. By linking the complete CI process, institutions can enhance their overall performance.

5.4.3.2 Practical Implications

The contributions and findings of this research along with the proposed framework are highly relevant for practice particularly for top management in institution of higher learning in Malaysia. These insights can help organisations establish a structured process for planning, collecting, and analysing credible and quality information usable for effective decision-making. The strong correlation between highlights the potential for IHLs CI to increase awareness accross the entire organisation pertaining to the value and advantages of CI. By doing so, institutions can achieve more sustainable organisational performance. Top management of IHL can gain valuable insights from

this study when formulating strategic plans that incorporate CI as a tool for generating effective intelligence. This model can also guide the formalisation of intelligence functions within institutions ensuring that their responsibilities are clearly defined to avoid data duplication and coordinate efforts dedicated to CI across the organisation.

Furthermore, this study is essential for CI practitioners or those involved in strategic planning as it provides a framework for embedding CI into their organisations. By leveraging this model, IHLs can improve their overall performance and strengthen decision making capabilities.

5.5 VALIDATION OF THE RESEARCH MODEL

5.5.1 Evaluation of the Validity and Reliability of the Research Model

The data of this study is collected from institutions of higher learning in Malaysia. The respondents of this study are individuals who deal with the formulation of strategic planning in organisations. Note that 595 self-administered Google Form questionnaires were emailed, and only 92 questionnaires were received, with a response rate of 15.5%. SEM PLS 4.0 software and CFA (confirmatory factor analysis) are used to determine the validity of each construct. This study also shows that the validity of four constructs is acceptable using confirmatory factor analysis.

The measurement model and structural model were analysed using SEM PLS 4.0. Four constructs were identified through CFA and were organised into Lower Order Constructs (LOCs) of CI and two constructs for LOCs for organisational performance. These LOCs were combined to establish formative Higher Order Constructs (HOCs). Convergent validity for CI constructs was established because all indicators were beyond the threshold of 0.4, ranging from 0.718 to 0.916, and the Average Variance Extracted (AVE) was beyond the threshold of 0.5.

Convergent validity for organisational performance constructs was also established due to the indicators of the constructs were beyond the threshold of 0.4, ranging from 0.531 to 0.852. AVEs for the constructs were below the threshold of 0.5,

indicating less than 50% of the variance of the items explaining the construct and all. Even though AVEs were below 50%, the indicators were retained in the analysis.

Convergent validity for organisational factors constructs was also established in this study. All the outer loadings for the indicators of the constructs were also beyond the threshold of 0.4, ranging from 0.647 to 0.875, and all the indicators were retained in the analysis. AVEs for all the constructs were beyond the threshold of 0.5 or 50%, showing an acceptable convergent validity. The measurement model for this research exhibited internal consistency, indicator reliability, convergent validity, and discriminant validity. There were no collinearity issues in the structural model.

There is no issue of collinearity as VIF values of each LOC ranged from 1.673 to 3.967, which were lower than the cut-off point of 5. The value of SRMR for LOC in this study was 0.108, while HOC was 0.051, indicating the model's fitness fit. Furthermore, the NFI for HOC 0.911, which is near 1.0, also indicates a strong model fit for this study.

5.5.2 Assessment of the Fit and Robustness of the PLS-SEM Model

In this study, the proposed research model explains 50.11% (R^2) of the variance of organisational performance that can be considered moderate. The model's quality is measured by calculating Cohen f^2 values that show the effect size of the relationship between CI and organisational performance, which is medium effect size, while there is no effect size for awareness & culture and process & structure. Here, 40 endogenous indicators in PLS-SEM analysis have smaller prediction errors compared to the LM. Thus, we can conclude that the model has a medium predictive power. Harman's single-factor test showed that the larger factor explains 38.9 % of the total variance. Thus, there is no single since the percentage is less than 50%, affirming there is no common bias in the collected data.

AIC4 and BIC in FIMIX-PLS explain that unobserved heterogeneity is not at a critical level, which supports the results of the entire data set's analysis. Measurement model by gender and age group of 28-37 years old, which was fully invariant, exhibiting

configural invariance, invariance through equity of means, and invariance through equity of variance based on the p -value > 0.05 . However, this model was not fully invariant by position and education level, which failed to meet configural invariance, invariance through equity of means, and invariance through equity of variance based on the p -value > 0.05 and therefore, a multigroup analysis on the pooled data level could not be executed (Henseler et al., 2016).

MGA analysis using Henseler's MGA and permutation test. The results indicate insignificant differences across gender and age groups of 28-37 years old in the relationship between CI on the organisational performance, awareness, and culture on the organisational performance and process and structure on the organisational performance, exhibited by its p -value > 0.05 .

5.5.3 Confirmation of the Theoretical Foundation and Model Support from the Findings

This study confirms that the theoretical foundation of RBV and KBV support the role of CI in creating effective intelligence which in turn impacts the performance of institutions of higher learning in Malaysia. CI effectively transforms information into actionable intelligence a crucial factor for sustaining organisational performance. However, effective intelligence can only be produced after information undergoes the complete CI process. Implementing CI in an organisation addresses issues of unstructured, uncoordinated, and disorganised information in both the internal and external environment. As identified in the literature review, the proposed model offers an initial framework that link various literature streams to the CI discipline.

CI also resolves the absence of a university-wide assessment process for collecting, analysing, and disseminating information enabling institutions of higher learning in Malaysia to better manage the uncertainty and dynamic changes in the higher education sector. Strong information systems and a culture of knowledge sharing are essential for generating effective intelligence. However, this study found that these factors were not fully realised in the IHLs in Malaysia. In addition, other organisational

factors, specifically process, structure, awareness, and culture, were not found to moderate the relationship between CI and institutional performance.

5.6 IMPLICATIONS FOR THEORY

5.6.1 Discussion of How the Findings Extend or Refine Existing Theories

This study extends and refines the theoretical foundations of the RBV and KBV. RBV emphasises the importance of organisational resources in improving performance of the organisation while KBV as a subset of RBV highlights the critical role of knowledge in achieving competitive advantage. In this context, CI serves as a systematic and comprehensive process that produces distinctive intelligence to be used by the decision-maker for effective decision-making. This capability is crucial for organisations striving to improve and sustain their performance in response to stakeholders expectations.

Effective intelligence must be both timely and of high quality to contribute meaningfully to organisational performance. Effective intelligence offers a resource that aligns with the Valuable, Rare, Imitable, Organize (VRIO) framework as proposed by RBV. By demonstrating how CI generates a competitive advantage through distinctive intelligence, this study validates and strengthens the theoretical link between CI and organisational performance. These findings reaffirm the role of RBV and KBV in explaining how internal resources particularly intelligence derived through CI drive performance improvements and sustainable success.

5.6.2 Identification of New Insights and Theoretical Frameworks Emerging from the Research

This study provides valuable insights into the relationship between CI and organisational performance contributing to a deeper understanding of strategic management literature. CI emerges as a highly effective strategic management tool for forward-looking practices, particularly in the context of institutions of higher learning

(IHLs). By identifying constructs to measure organisational performance, this study addresses a significant gap in the literature as these constructs had not been previously tested in the context of Malaysian IHLs.

The findings reveal that the organisational performance of IHLs in Malaysia can be categorised into two main dimensions: academic performance and administrative performance. Academic performance encompasses academic and research outcomes, while administrative performance includes outreach, internationalization, resources-infrastructure, resource-financial, and assessment performance. This categorisation provides a comprehensive framework for evaluating IHLs performance offering a clearer understanding of how CI practices affect various facets of institutional success.

5.6.3 Explanation of How the Findings Contribute to Advancing the Field

By developing and testing the proposed relationship within the research framework addressing CI, organisational factors and organisational performance, this research contributes to the existing body of literature in several significant ways.

Firstly, the main theoretical implication of this study is the development of a research framework for analysing the relationship between CI and organisational performance. This framework offers a systematic approach for understanding the role of CI in enhancing institutional success particularly in the context of institutions of higher learning in Malaysia. Secondly, this study revealed that the CI variable was significantly and positively related to organisational performance for IHLs in Malaysia. These findings were consistent with prior research and supported by studies such as Mohd. Asri & Abdul Mohsin (2020) affirming the robustness of the proposed framework.

Additionally, this research provides a foundation for further research on measuring organisational performance of IHLs in Malaysia. Recognising that performance indicators may vary based on the objectives of individuals institutions, the study identifies sub-constructs of organisational performance that can serve as a basis for future research. These sub-constructs offer flexibility and relevance for researchers

seeking to adapt and expand upon this framework in different institutional or regional contexts.

5.7 IMPLICATIONS FOR PRACTICE

5.7.1 Translation of the Research Findings into Practical Implications

The practical implication of this study can be summarised into five key conclusions: (1) Effective intelligence could only be produced after completing the entire CI process, (2) CI has a direct and significant effect of CI on organisational performance of institutions of higher learning in Malaysia, (3) There is an insignificant indirect effect of process and structure on the relationship between CI and the organisational performance, (4) There is an insignificant indirect effect of awareness and culture on the relationship between CI and the organisational performance, (5) The organisational performance of IHLs in Malaysia can be divided into two sub-construct; academic performance and administrative performance.

From the study, we can conclude that institutions of higher learning should ensure individuals dealing with CI possess skills or proficiency in collection and analysis. They must also be trained in interview and negotiation skills during the plan and focus stage to obtain key information needed by the decision-makers. Institutions of higher learning should also invest strategically in data analysis tools, the latest technology, and software that facilitate timely communication and quality intelligence to decision-makers (Khalid, 2023). This strategy will enhance the overall effectiveness of CI leading to improved organisational performance of institutions of higher learning in Malaysia.

5.7.2 Recommendations for Practitioners Based on the Study's Insights

The findings of this research provide practitioners with an in-depth understanding of the need to strengthen CI in their organisations. Top management of institutions of

higher learning should be aware that to excel and achieve sustainable performance, CI must be supported with appropriate policies and procedures. They must also strengthen formal or informal structure and aggressively spread awareness of what CI means and the advantages of having CI in their organisation. Additionally, they should inculcate a culture of information sharing and competitiveness within the organisation in address future challenges that might affect their existence in the higher education industry.

This study provides insights for practitioners who seek to leverage CI to enhance their organisation's performance. Practitioners would better understand activities in their market environment enabling them to make strategic decisions. This model can also serve as a guideline for practitioners to understand their job scope in the CI process to contribute effectively and efficiently.

CI produces knowledge that will be beneficial for increasing organisational performance. It always produces distinctive knowledge that benefits the organisation in the long run due to differences in skill, experience, and methods in managing information. Practically, a statistically significant explanatory relationship suggests that performance outcomes can improve when organisations effectively include CI in their operations. Therefore, practitioners must prioritise CI to achieve superior results and maintain a competitive edge in the higher education sector.

5.7.3 Discussion of Potential Applications and Strategies Arising From the Findings

This study provides academic practitioners, researchers, and organisational leaders with a deeper understanding of the relationship between CI and organisational performance of IHLs in Malaysia. Consistent with prior researchers which established a statistically significant relationship between CI and organisational performance in both local and global business industries, this study also finds a similar relationship within the Malaysian IHLs context.

Furthermore, researchers could explore the organisational factors such as process, structure, awareness, and culture that moderate the relationship between CI and

organisational factors in other industries. While CI theory is still developing especially in Malaysia, future research should extend this exploration to other sectors. Instruments developed in other countries to measure CI and organisational performance proved effective for IHLs in Malaysia, though adjustments may be needed to account for organisational factors such as process, structure, awareness, and culture.

Competitive intelligence (CI) is essential for institutions of higher learning to make informed strategic decisions, foster innovation and improve operational efficiency by monitoring market trends, aligning curricula with market demands, and identifying emerging research areas. CI also strengthens global competitiveness by enabling IHLs to adopt best practices and form international partnership. Additionally, CI fosters industry collaborations by identifying potential partners and aligning academic programmes with industry needs. It also supports financial sustainability by providing insights into funding opportunities and market trends while also improving institutional efficiency through better resource allocation and operational streamlining.

Maximising the benefits of competitive intelligence requires organisations to improve key factors such as processes, structure, awareness and culture. This can be achieved by establishing clear workflows, creating dedicated CI teams and fostering collaborative and competitive organisational culture. Adapting internationally developed CI tools to the local context ensures effective measurement and continuous improvement. Furthermore, investing in staff training on data analysis and intelligence management is essential for sustaining performance and ensuring long term success in leveraging CI.

5.8 LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

5.8.1 Identification and Discussion of the Limitations of the Study

This study has several limitations that should be considered when interpreting its findings. First, the survey instrument included responses where respondents answered 'Neutral', which may impact the accuracy of the data on CI. Furthermore, as a self-

report, there is an inherent assumption that respondents understood the question correctly and answered truthfully and voluntarily.

Furthermore, this research did not collect qualitative opinions on CI which could have been addressed through a mixed method approach. The relatively small sample size of only 92 participants limits the generalizability of the findings as it may not adequately reflect the wider population of institutions of higher learning in Malaysia. The sample size also does not capture the full diversity of the participant group.

Additionally, this study's findings may not fully represent the entire sector of institution of higher learning as the small size could lead to sample bias. Respondents who are not directly involved in strategic planning might have participated and some may have been engaging in CI without recognising it as such. Moreover, there may be confusion between CI and environmental scanning, which are different concepts.

5.8.2 Suggestions for Future Research to Address the Identified Limitations

Future research should consider using a larger sample size as this could provide a significant advantage in terms of statistical power. A larger sample size would likely lead to stronger and more reliable results which could potentially yield different and more robust outcomes compared to the current study. It is worth noting that the sample size used in this study was the minimum number required for PLS-SEM. Moreover, this study demonstrated that effective intelligence can be generated when organisations establish fundamental procedures for managing information. The quality, credibility, and accuracy of information are critical in generating effective intelligence which decision-makers can utilise for strategic decision-making.

Mixed methods studies (qualitative and quantitative) should be carried out to gain deeper insights into the factors that enhance the organisational performance of IHLs in Malaysia. While longitudinal research may require more time and resources but it offers significant advantages. Such studies could provide stronger evidence of the moderating effects of process and structure as well as awareness and culture on the

relationship between CI and organisational performance, as supported by previous studies.

5.8.3 Exploration of New Avenues for Further Investigation Based on the Research Findings

Researchers could replicate and expand this study with the refinement to the fixed number in the Likert scale, such as Neutral. It could not infer the actual views of the respondents and capture variations in participants' attitudes or views. Refining the Likert scale may provide insights into the CI practice in the IHLs in Malaysia and provide a comprehensive understanding of the measured constructs. Participants might feel obliged to select a response from the available options, even if their actual views do not correspond with those options.

Based on the intelligence cycle literature, other additional constructs should also be tested to determine whether these stages such as feedback, use, and evaluation of CI could be incorporated into a complete CI procedure. Including these stages and identifying further relational constructs could contribute to a more effective CI model which potentially improving organisational performance.

Furthermore, future research should also investigate the effects of organisational size and type on the relationship between CI and organisational performance. Smaller organisations might face difficulty in building and developing CI in their organisation due to resource constraints (Sayyman et al., 2008; Calof, 2020). Public and private institutions of higher learning may pursue different strategic aims which can influence the intensity of CI practice in their organisation (Garcia-Alsina et al., 2013; Garcia-Alsina et al., 2016). For profit institutions, driven by the need to generate revenue, often prioritise CI practices as essential for their survival and continued viability. In contrast, well-established institutions tend to focus on improving their rankings or status as part of their long term strategic goals.

5.9 CONCLUSION

5.9.1 Recapitulation of the Main Points Discussed in the Conclusion Chapter

This study concludes that CI directly impacts the organisational performance of institutions of higher learning in Malaysia through the generation of effective intelligence. This outcome is achieved only after completing the full CI process which include plan & focus, collection, analysis, and communication. In order to ensure sustainable performance, institutions of higher learning in Malaysia should consistently promote CI in their organisation, as CI is the best tool to deal with the highly competitive and dynamic higher education landscape. From the outcome of the study, the following were also concluded;

The study concluded that process, structure, awareness, and culture did not moderate the relationship between CI and the organisational performance of IHLs in Malaysia. Furthermore, the study also concluded that the organisational performance of institutions of higher learning in Malaysia can be divided into academic and administrative performance.

5.9.1.1 Implications for Practice

The findings of this study suggest that IHLs in Malaysia should place greater emphasis on developing and institutionalising CI processes. By doing so, they can enhance their ability to make informed decisions, stay competitive and respond effectively to the changing dynamics of the higher education sector.

5.9.1.2 Implications for Theory

This study contributes to the theoretical understanding of competitive intelligence (CI) in the context of institutions of higher learning in Malaysia. It provides evidence that effective implementation of CI directly impacts organisational performance reinforcing

the relevance of the CI framework in higher education. The findings also suggest that while certain factors like process, structure, awareness and culture were not found to moderate the CI-performance relationship, future theoretical models might consider integrating other constructs that could provide deeper insights into this dynamic. This research expands the body of knowledge on CI by contextualising it within the higher education sector and highlights the need for further theoretical exploration into how CI can be operationalised for optimal institutional performance.

5.9.2 Final Remarks on the Significance and Relevance of the Study

This study aimed to examine the extent of CI in higher learning institutions in Malaysia. This study also examined the strength of the relationship between CI and the organisational performance of these institutions. Moreover, this study also examined the moderating effects of organisational factors such as process and structure and awareness and culture on the relationship between CI and the organisational performance of institutions of higher learning in Malaysia.

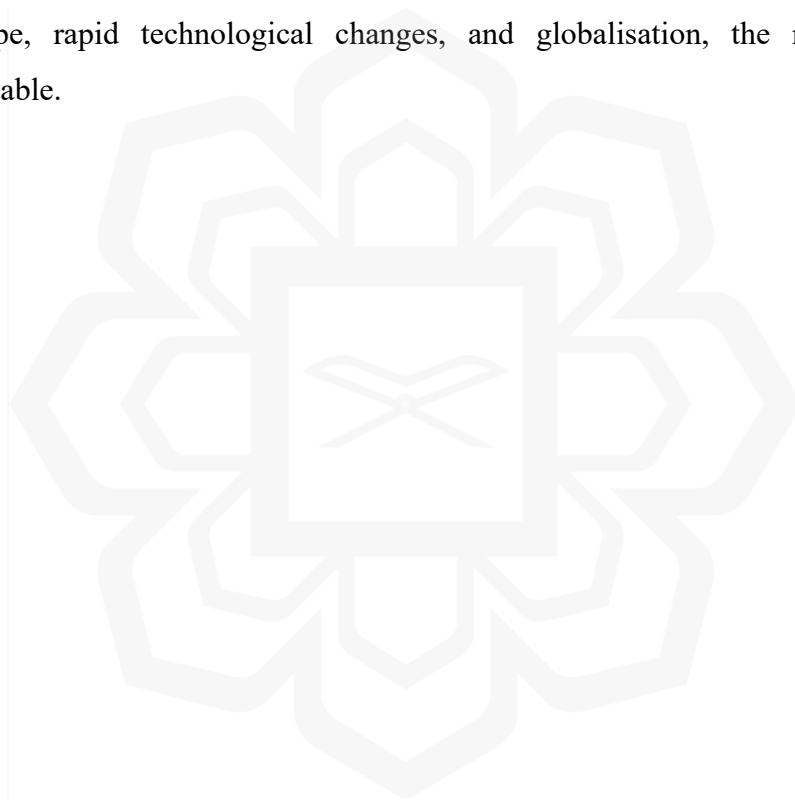
The proposed conceptual framework was evaluated using PLS-SEM. Other than that, PLS-SEM 4.0 software was used to analyse the data. The reliability of the questionnaires was evaluated with three criteria: Cronbach's Alpha, composite reliability, and convergent validity. Furthermore, the quality of the measurement, structural, and overall models were analysed, and the hypotheses were tested.

5.9.3 Closure of the Thesis by Reiterating its Overall Contribution to the Field

Prior to this study, limited research existed on the topic of relationship between CI and organisational performance in the context of institutions of higher learning (IHLs). This study aimed to measure whether such a relationship exists and to what extent it impacts organisational performance for IHLs in Malaysia. This study addressed a gap in the literature and expanded both theory and knowledge on CI, organisational factors, and organisational performance. The theoretical and conceptual framework for the

relationship between CI and organisational performance are still relatively new and largely unexplored. The results supported the validity of the conceptual framework demonstrating its effectiveness in measuring the relationship between CI and organisational performance.

The assessment of the relationship between CI and organisational performance for institutions of higher learning in Malaysia also contributed to enhancing the competitiveness and sustainability of these institutions. The benefits of CI have been discovered and applied in various industries and countries its relevance to IHLs in Malaysia is particularly critical. Due to the highly competitive higher education landscape, rapid technological changes, and globalisation, the need for CI is indisputable.



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