



Cyber University Image: A Systematic Literature Review and Future Research Agenda

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Abstract

The objectives of this study were to understand how Cyber University Image (CUI) is defined, identify CUI enablers and the theories behind the proposed construct of CUI, and make recommendations for future research in this area. This study employed a systematic literature review (SLR) technique, conducting comprehensive searches of related business management, information technology, and education datasets. The goal was to identify all relevant literature in the field while focusing on the most relevant literature to the research question. From 2012 to 2022, this study examined the research topics, settings, methods, and technological advances in cyber university and brand image in the university domain. Following a review of peer-reviewed journals, a total of 54 refereed articles were chosen and analyzed. Findings – The paper reveals that the potential benefits of implementing branding strategy concepts and theories are gradually recognized in the cyber university domain. However, the literature on smart universities and brand image as one of the branding strategies is still incoherent and lacking in theoretical frameworks that reflect the specific circumstances of branding strategy in the university domain, revealing the need to organize them.

Furthermore, the SLR reveals the urgency behind the proposal of a new construct, CUI, as a more appropriate and integrated term for brand image in the SU domain. Research limitations/implications – CUI research is still in its early stages, with more work from an identifying problems and strategies perspective. Originality/value – The paper proposed a revised construct of brand image in the cyber university domain, that is, Cyber University Image (CUI) and its enabler. The new construct of CUI will contribute to a more appropriate university branding strategy in a highly competitive digital era market.

Keywords: University, Cyber University Image (CUI), Brand Image, Cyber University

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INTRODUCTION

Universities must thrive in an increasingly competitive global context in the digital era (Farhat et al., 2021; Gibbs, 2018; Koris et al., 2015; Brumby, 2014; Arambewela & Hall, 2013; DeShields et al., 2005). In response, universities have increased their branding efforts to maintain a competitive higher education market (Musselin, C., 2018; Spry, L., Poorrezaei, M., & Pich, C., 2018). Research evidence shows educational institutions have adopted corporate-like branding techniques that include traditional branding efforts such as reimagined logos, appealing advertising campaigns, catchy taglines, brochures in order to promote their service offerings with the main goal of achieving, sustaining, and expanding their intended market position (Karaosmanoglu, E., & Salman, G. G., 2019; Pizarro Milian, R., & Davidson, C., 2018) and other innovative marketing avenues, such as social media (Kumar, V., & Nanda, P. 2019). In addition, these branding efforts of educational institutions were conducted to maintain other income-generating activities, such as research grants or philanthropic donations (Nguyen, N. P., & Mogaji, E. 2022). Similar efforts of 'university marketization' required an appropriate brand image or identity – as a part of branding efforts- to create a better marketing strategy. It is essential to emphasize that universities may understand the idea of institutional image differently than other service organizations. (Alwi, S., Che-Ha, N., Nguyen, B., Ghazali, E. M., Mutum, D. M., & Kitchen, P. J., 2020; Hemsley-Brown, J., & Oplatka, I., 2006). Thus, the university brand image domain has become a challenging and trending topic in recent studies.

Students can recognize the differences between universities through successful or effective brand image creation and develop their selection intentions (Lien Thi Kim Nguyen, Tom M. Y. Lin, and Hoang Phuong Lam, 2021). Previous research has shown that the university image is a crucial source of competitive advantage. As an example, Panda, S., Pandey, S. C., Bennett, A., and Tian, X. (2019) demonstrate that a unique brand image plays a key influence on students' levels of satisfaction in both the United States and India and that it is connected to service quality, which has a larger effect on the levels of student satisfaction. Cassidy (2019) explores the effect of brand orientation on loyalty, student satisfaction, and post-purchase communication behavior in higher education. This study examined its connection to satisfaction, positive word of mouth, and service quality. Kaushal, V., and N. Ali (2020) investigate the impact of university legacy and reputation on prospective students' attitudes. Nguyen et al. (2016) address the significance of brand ambidexterity in increasing student engagement in the higher education industry. Tien, N. H., Minh, H. T. T., and Dan, P. V. (2019) propose that branding and strategically positioning the brand can help universities build a distinct image.

Current research in exploring university brand image has strongly connected it to the terms of digitalization. The concepts of cyber university, smart education, digital University, cyber University, intelligent University, and similar topics were the primary subjects of various branding-based strategic plans. Tikhomirov (2015) described a Cyber University as a concept that thoroughly upgrades all educational procedures. Uskov, V. L., Bakken, J. P., Pandey, A., Singh, U., Yalamanchili, M., and A. Penumatsa (2016) define smart education as a combination of ICT and faculty that results in an altogether new level of quality in the processes and outcomes of educational, commercial, research, and other university operations. According to his study, "smart" in education implies the advent of technology such as smart boards, smart displays, and wireless connectivity from anywhere. Meanwhile, Min-Allah, N., and S. Alrashed (2020) characterized Smart Campus as an emerging concept that enables educational institutions to merge smart technology with infrastructure for enhanced services, campus sustainability, decision-making, etc. Under the banner of smart campus, several solutions have been installed on campus, such as smart classrooms, smart microgrids, regulating visual and thermal elements of buildings, collecting student attendance through smart cards/face

recognition, and so on. According to previous research, smart education provides academic and training organizations with unique and unprecedented opportunities in terms of increased standards and innovative solutions to (1) teaching and learning strategies—smart pedagogical practices (Shoikova, E., Nikolov, R., & Kovatcheva, E. (2017)); (2) distinctive technologically advanced services for local on-campus and distant students, (3) set-ups of innovative classrooms with easy local/remote s (Afify, M. K., 2020). Other scholars investigating the term "Smart Campus" indicated that it is the higher level of an educational information system, and the growth of smart campuses depends on the building and development of a digital campus. S. H. Sadeghi (2022). Cesur, R., Torkul, O., Cedimolu, H. and Seda, U. A. R. (2019) explain the concept of a smart campus, which has been proposed for many years, to provide excellent services dynamically and proactively for students, teachers, and other university employees in the Internet of Things era.

The phrase "cyber university" is defined by Carius, A. C. (2020) as the concept of a university in cyberspace, including the relationships between teachers and students, which are mediated by technological tools. On the other hand, interactions between human and non-human actors occur in the cyber university. In Indonesia, the cyber university criteria have not been standardized. However, as an effort towards smart-university standards, the Ministry of Education and Culture has assessed the adoption of digitalization in public and private universities in Indonesia through the TeSCA Digital Adoption in learning and student activities as a form of commitment to support the advancement of education in Indonesia. The higher education assessment method uses the ZEN framework methodology developed by the Executor Director General of Higher Education Kemendikbud Prof. Dr. Nizam, M.Sc., DIC. Ph.D., General Chair of Aptikom Prof. Zainal A. Hasibuan, MLS, Ph.D., and Prof. Dr. Ir. Richardus Eko Indrajit, M.Sc. MBA, Mphil, MA. The Tesca Digital Adoption assessment includes five categories: Digital Service, Digital Infrastructure, Digital Innovation, Digital Learning, and Smart Collaboration.

Despite using different terminology in universities in the digital era, the concept of brand image related to university has been applied in various ways. The idea of brand image is often ill-defined due to a lack of widely accepted definitions, being ambiguous and far from the original intent (Lee, J. L., James, J. D., & Kim, Y. K. (2014). Due to various terminologies, the elements of university brand image in the digital era are widespread and fragmented. However, in the global competition, it is becoming increasingly important for university management to understand brand image concepts for making appropriate strategic marketing decisions (Tight, M. 2019). Although the terms "brand image" and "cyber university" have been established and utilized in numerous contexts in previous research, unfortunately, there is no consensus about the brand image concept in a cyber university. The concept can be confusing because of the variety of phrases related to universities in the digital era, such as digital University, smart University, cyber University, intelligent University, and other dispersed phrases. Thus, from the semiotic perspective, the reconceptualization of university brand image needs to be conducted. Similar to the concept of "Green Brand Image," which emerged from the concept of Corporate Social Responsibility as a developing concern in branding (Malik, M. E., Naeem, B., & Munawar, M., 2012), the Cyber University concept should also be considered in determining brand image. There is space for comprehensive implementation in assessing and developing a university brand image. Therefore, a revised construct, namely Cyber University Image (CUI), is proposed. CUI is expected to be defined through a systematic literature review (SLR) to obtain a more comprehensive understanding. As a result, this study aims to perform an SLR on CUI to build a knowledge foundation for future research and establish the domain of smart universities.

The objectives of the review were to answer our research questions (RQ), which are: (RQ1) to understand how CUI is defined; (RQ2) to identify enablers of CUI. In addition, the SLR was intended to establish the scope of university branding as a basic component of higher education marketing, amplify the theories behind the proposed CUI construct, and offer recommendations for future research in this area. The research starts by summarizing the cyber university brand image. Then, it provides a brief overview of the rise of cyber university research in university marketing in the current global market. The method for selecting and evaluating the literature, the search strategy, and the review criteria are described. By identifying high-quality scholarly articles published between 2012 and 2022 that study the image of smart universities, this study adds to the construction of a roadmap. It provides recommendations to assist scholars and university administration in developing an effective institution branding strategy. The objectives and constraints that guided this systematic study are outlined, followed by a thematic analysis of the research's results to build the new construct of CUI as the reconceptualization of brand image in the domain of smart universities. The final section focuses on a review of the limitations and gaps in present research, as well as recommendations for future studies on the topic. The study concluded, however, that the study area of cyber university image is still in its initial stages, with much more exploratory and strategic research to be conducted.

METHOD

The SLR is conducted in five stages, as adopted by Rowe (2014), to answer research questions. This method was adopted to perform a systematic literature review on Cyber University's brand image. Identifying brand image in smart universities will strengthen the theoretical background to propose a new construct of CUI as a main objective of this SLR. Indeed, we may describe the enablers of the CUI. As for sample sources, the study seeks qualifying complete research publications (excluding brief communication papers, research notes, conference proceedings, editorial notes, book chapters, and industry whitepapers) within the research domain. To gather samples, an advanced search was conducted using a top-to-bottom five-step process (Miah et al., 2017a). An extensive search was conducted to compile a list of most of the articles from reliable and relevant databases. All of the articles were chosen between 2012 and 2022. ProQuest, Emerald, and Scopus were selected as data collection databases. After searching, 52 selected full articles were obtained from several journals such as International Review of Research in Open and Distributed Learning, Interactive Technology and Smart Education, Electronic Journal of Information Systems Evaluation, PloS One, and two articles focusing on semiotic principles of branding were added to the final reviewed articles. Thus, we reviewed 54 articles in total. Thesaurus search terms were used to search electronic and online databases. The review considered publications in the English language, with most of the research areas from the UK, the USA, Asia, and Europe. To determine the relevance of articles for this study, we first applied inclusion and exclusion criteria based on (1) language, (2) publishing form, and (3) subject (See Table 1 and Table 2).

Table 1. Exclusion Criteria

No	Criteria	Reason for exclusion
1.	Pre-2012	Consider recent articles on the topics.
2.	Notes for research, brief communication papers, editorial notes, conference proceedings, book chapters and industry whitepapers, or	Less in-depth study

	non-academic or technical documents	
3.	Smart Transportation and Smart Tourism	The review is concerned with the smart environment in the university domain.

Table 2. Inclusion Criteria

No	Criteria	Reason for exclusion
1	2012-2022	The study focused on the latest 10-year articles
2	Peer-reviewed journal articles	Academic publications with in-depth and quality studies
3	English articles	The majority of relevant research publications are written in English.
4	Quantitative/Qualitative/Conceptual	To take into account empirical evidence as well as literature reviews
5	Articles in the area of cyber university, smart environment learning, and digitalization adoption in university	covering a wide variety of subjects ranging from the components or aspects of smart University
6	Articles focus on the semiotic meaning of brand image	discussing the importance of appropriate words/phrases to describe the brand image in the specific framework
7	Articles focus on brand image in a university context	describing its strong relationship with students' satisfaction
8	Articles with content of intersection of various important subjects, namely, smart universities, university brand images, co-creation values, and customer satisfaction	Describing brand image in a more specific framework, namely smart-university

We excluded smart transportation and tourism publications because they explored larger phenomena like tourism, transportation, nations, or regions rather than focusing on university institutions. Recent literature reviews on higher education, smart campus, digitalized campus, university brand image, and university branding strategy present detailed summaries of results from this research stream. Publications addressing the implementation of online education were closely related to smart universities rather than social media activities, and they were omitted from the literature review. Most research on branding strategy in several commercial companies and fields was considered out-of-scope content from this SLR since the education sector has different characteristics from other service companies.

The first stage collects interdisciplinary journals from the search engine to acquire articles based on the keywords 'cyber university' and 'brand image.' This search form returns many articles, which must be filtered to get more precise extractions. The first step resulted in 1277 total articles from 3 databases, namely 110 articles from the Scopus database plus 685 articles from ProQuest and 482 articles from Emerald. In the next step, we screened the most relevant titles and abstracts, which resulted in 685 articles, and removed 592 articles from the list. Then, we conducted full-text screening and found 205 articles with the most relevance to the topic purpose, findings, or implications containing the keyword Screening Criteria. Finally, from a thorough screening of the context, research focus, quality assessment, and analysis units, we listed 52 articles subjected to further review. 2 articles with the content of brand image semantic perspectives were added to the final reviewed papers. A total of 54 papers were reviewed in this SLR. All the steps that were conducted are shown in Figure 1 in the form of a funnel diagram.

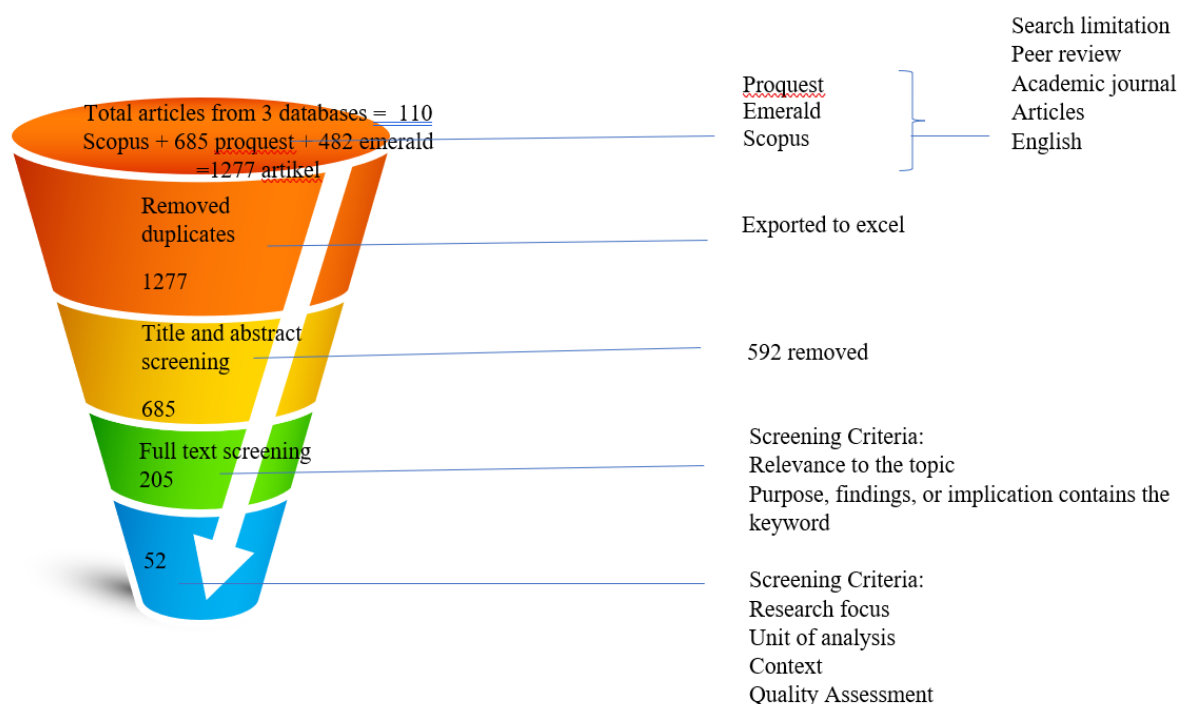


Fig. 1: Steps Taken to Conduct SLR in The Form of a Funnel Diagram

Findings

The findings from the systematic analysis of relevant literature are presented in two parts. The first part gives CUI definitions, explanations, characterizations, terminology, concepts, and interpretations. The second part elaborates on CUI's enablers, indicators, and dimensions with a conceptual framework. Both sections were conducted by reviewing articles in the relevant scope (brand image, cyber university, digital adoption, etc.), which aimed to strengthen the theoretical background for the newly proposed construct named Smart Image University (CUI).

Articles Characteristics

The study of smart and cyber-universities is a relatively new field of research. It started historically in the early 21st century when the term "Internet of Things" began to be widely echoed by the press, such as Forbes, The Boston Globe, and The Guardian, regularly mentioning it. The First International Conference on the Internet of Things was held in

Switzerland in 2008, as interest in IoT technology continues to expand, especially its application in education. Thus, in this decade, IoT has started to be widely applied in education, especially in the university domain.

As shown in Figure 2 Screening Criteria, 54 articles were finally included in this SLR based on the screening on Research focus, Unit of Analysis, Context, and Quality Assessment. Table 2 shows that more than 37% of the articles were published in the last five years in the Journal of e-Learning and International Review of Research in Open and Distributed Learning (8 articles), Interactive Technology and Smart Education (5 papers), Electronic Journal of Information Systems Evaluation (2 articles), and PloS One (2 articles). The 54 articles in the study were published in 33 different publications (see Table 3). Figure 2 shows that 36% (20 articles) focus on smart universities, smart environments, and the adoption of digitalization in universities, covering a wide variety of subjects ranging from the components or aspects of smart universities. 4% (2 articles) focus on the semiotic meaning of the brand image, discussing the importance of appropriate words/phrases to describe the brand image in the specific framework. 7% (6 articles) focus on brand image in a university context, describing its strong relationship with student satisfaction. Most articles (53 %) (26 articles) discuss the intersection of various important subjects: smart universities, university brand images, co-creation values, and customer satisfaction.

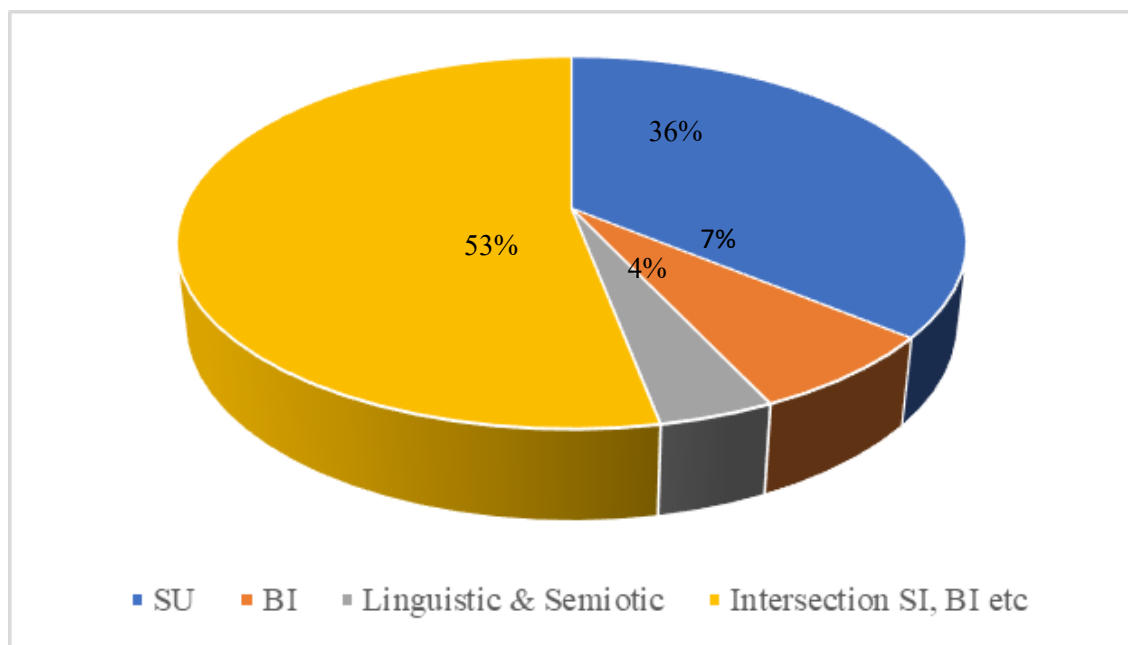


Fig. 2: Content of Articles

Most of the research, such as narrative interviews or case studies, employs a quantitative approach supported by a literature study (60%). Qualitative research methods should be more utilized by 40%. Regarding geographical areas, 47 54 empirical investigations were conducted in industrialized Western countries. Western Europe has the highest research activity (22 studies), with the majority of it focused on Russia (8 studies) and Ukraine (2 studies), followed by the United States (10 studies). Only nine studies from Pakistan and Malaysia are from emerging nations. The subject is of considerable interest in Asia, with nine papers from this area, particularly the Middle East. In cross-country studies, three research initiatives encompass both industrialized and developing nations. There were no submissions from Africa.

Table 3. Journal List of Reviewed Articles

Journals	Total Articles
International Review of Research in Open and Distributed Learning	8
Interactive Technology and Smart Education	5
Electronic Journal of Information Systems Evaluation	2
PloS one	2
Technology in Society	1
Data	1
European Journal of Futures Research	1
Teaching in Higher Education	1
Seria Științe Economice	1
Education Sciences	1
Sensors	1
SA Journal of Information Management	1
Sustainable cities and society	1
International Journal of Advanced Research in Science, Communication and Technology	1
Computers & Education	1
Journal of Business and Retail Management Research,	1
Applied Sciences	1
Research in Learning Technology	1
Education Sciences	1
Sustainability	1
Economics and Sociology	1
Library Philosophy and Practice	1
Journal of Marketing for Higher Education	1
Canadian Journal of Higher Education	1
Education and Information Technologies	1
Management Science Letters	1
Smart Learning Environments	3
Journal of Visual Languages & Computing	1
Int. J. Comput. Appl	1
Technological Forecasting and Social Change	1
International Journal of Social Sciences & Educational Studies	1
Springer, Cham	1
Social Semiotics	1
European Journal of Information Systems	1
Information Systems	1

The Concept of Cyber University Image (CUI)

According to Rico-Bautista et al. (2019), smart education and smart universities are fast developing and expanding in sectors that reflect an integration of (1) smart objects, smart systems, and smart environment, (2) computer engineering and computer science, smart technologies (3) agents, state-of-the-art smart systems, hardware tools and/or educational software, and (4) teaching strategies, innovative pedagogy and learning methodologies based

on smart objects, smart systems, and smart environments. Meanwhile, the cyber university concept states that an institution is smart if it contains the following characteristics:

- Formal and informal education requires a special intellectual environment to enhance the competencies of the educational process's subjects and objects.
- A highly developed university technological "architecture" that promotes the active utilization of smart technology and devices in the teaching process.
- The educational material is created using standardized data and description standards.
- Compatibility of software built for multiple operating systems (so-called "seamless"), ensuring equal access capabilities for all educational process participants from any device.
- Individualized education is ensured through a comprehensive collection of adaptable educational programs.
- A well-developed e-learning and m-learning system built on Web 2.0 capabilities gives students global access to educational information regardless of time or location.
- Within a higher framework, a well-developed electronic university
- Realization of a Quick Start idea for learning in the context of an electronic university.
- Participation of practitioners in curriculum design and assessment of efficacy
- Smart Learning; Adaptive Teaching; Automatic Translation Systems (from/to the English Language); Learning-by-Doing (Virtual Laboratories); Collaborative Learning; Gamification in Learning.

"Cyber University" is a notion, an idea, and a phrase with global recognition as a "brand". "Branding" is the "practice of creating a name, symbol, or design that identifies and differentiates a product from other products" (Bohle, M., & Marone, E., 2021). That basic commercial notion demonstrates the semiotic relevance of how signs and symbols establish meanings, and branding the phrase (symbol) "Cyber University" means to provide an identity that distinguishes this sign from others. There are numerous interpretations of "cyber university," and the implications for branding strategy practice are obvious (Cocoli et al., 2014; Uskov et al., 2016; Timikhorov, 2017). The idea of a Cyber University Image (CUI) labels a specific brand image within a university branding strategy that considers Cyber University valuable. Thus, CUI is offered as a school of thought and may be found at the crossroads of several frameworks (brand image, marketing strategy, engineering, digitalization, and professional management). The structure CUI is offered as a term that explains the branding of a collection of ideas and activities and philosophical thinking within the context of a university's brand image. CUI, in turn, refers to "a range of applied and fundamental research fields, as well as related engineering, marketing disciplines, and commercial undertakings." Together, they address the functioning of brand image and the intersections of brand image and digital adoption in universities, which in this context is recognized as "Cyber University". In this part, we describe how CUI is defined and its meaning for an appropriate branding strategy, for example, because of the strong relation between theoretical concepts and marketing practice.

The Semiotic Principles of Branding

A brand is an intangible asset that creates distinguishing images and connections in the minds of stakeholders, resulting in economic advantages and value (ISO, 2019). According to the previous researcher, trademarks are rich connotative symbols whose implied rather than explicit meanings often give the greatest value (Danesi, 2006). However, Ashworth and Kavaratzis (2009) and others (for example, Morrison, 2013) advise that branding must go beyond the logo or phrase and involve entire tactics for creating or managing expectations among a target audience. For these reasons, Oswald suggests that applied semiotics may

significantly contribute to developing and accomplishing strategic branding and marketing goals. Wang and Zhang (2019) say that the use of semiotic resources in branding strategies is an important but understudied area. From the semiotic perspective, keywords have a direct pertinence to brand image. Semiotically, the definition of brand image as an abstract visual notion (e.g., status) is derived from many more or less symbolic indications. These signals may be seen in brand messages, store signage, social media texts, and other communication sources. In other words, brand image and positioning should be defined within specific conceptual frameworks according to foundational semiotic perspectives (Rossolatos, G. 2018). Hence, the specific conceptual frameworks, namely smart universities, are also applied as an integrated IoT space. For that aim, CUI was offered as a material resource for the establishment, reinterpretation, and reinforcement of the imposed brand ideology and its accompanying subjectivities since the space serves as a material venue for brand meanings and values to be semiotized, consumed, and appropriated. From a semiotic standpoint, if we define a university brand as something that links to "the total of ideas, emotions, and associations attached to a given institution," then the new construct of CUI would be more appropriate to define the image of a cyber university rather than a brand image phrase.

Concept of Brand Image of University

Many authors have defined "brand image" in different ways. There are not just meanings, but all meanings lead to a nearly identical meaning in which the importance of customer happiness and approval of the company as a brand is paramount. In terms of university branding, there are now many options. Brand image is based on a client's impressions and experience. Higher education institutions worldwide compete with one another to improve their rankings compared to other competitors. To qualify for the competitive category criteria, many components must be met. Consumers are becoming more interested in brands since a great brand has satisfied all competing needs and built itself by satisfying clients. Students nowadays are better informed about all colleges throughout the globe, and they find it easy to choose and favor a university based on its brand image.

Reaching the screen generation and informing them about manufactured goods and services is considerably faster and inexpensive today, thanks to social media. People have varied views on their children's university decision-making processes for several reasons, including the amount of money spent, the quality of instruction, stereotypes generated by particular instances, and so on, as well as whether a public or private institution gives a range of options for students (Azizi, Elezi & Mazreku, 2013). According to Shehzad, Ahmad, Iqbal, Nawraz, and Usman (2014), for any organization or business, a brand name that may positively impact people's purchasing behaviors as a tool or brand image plays a crucial role in order to improve performance. This study intends to investigate the effect of brand names on consumer purchasing behavior among university students in Gujranwala, Faisalabad, and Lahore. The research demonstrates that brand name or image has a substantial positive association with consumer purchasing behavior, and students are brand-sensitive and prefer branded products. According to Omar (2013), the university brand's nature is complicated, so that a commercial strategy may be more effective. Private or public institutions are in a world of competition today.

Therefore, to raise their market share, become more competitive, and continually distinguish their organization, they must give the market new initiatives and branding activities. According to Azizi et al. (2013), the research exposes current inequalities between public and private universities regarding quality development in higher education in Macedonia based on the survey and analysis of statistical data, weaknesses, and priorities for institutions. According to Kim and Periyayya (2013), for a branding plan to be effective, a higher education institution must include the essential anticipatory accounts of students. According to the study, private

institutions should have facilities, skilled academic members, and competent personnel. Mourad, Ennew, and Kortam (2010) improve academic knowledge of brand value in higher education and investigate its influence on governance procedures. Marketing in the service sector is challenging due to the distinctive aspects of the service and the dominance of expertise and credibility traits. Without a doubt, brand equity is the value that consumers place on the brand. The result validates the suggested conceptual model because brand equity is significantly more important than awareness-related variables. It also shows the significance of corporate brands and how well they interact with consumers, who are compared across several important brand dimensions as a source of information regarding service quality. The essay examines and maintains the service quality elements of perishability, invisibility, inseparability, and heterogeneity in Bangladeshi private universities.

To answer RQ 1, How is CUI defined?, we compiled the definitions of brand image and cyber university to understand the main idea. From this table, we can conclude how CUI is defined by integrating the notions of both phrases. Tables 3 and 4 describe the identification, notion, and idea of smart universities and brand image. The fields of computers, marketing, and university brand image have influenced the intersection between both phrases.

Table 4. Concept of Cyber University

Authors	Method/perspective	Definition
Eddie Blass and Peter Hayward 2014	Qualitative/Cognitive	Technology Innovation in HE (in this terms, Online tutorials/coaching) has strong relations with the reputation level of HE and the person involved. By fostering innovation, the institution may identify new ways to contribute value to society, allowing it to survive beyond 2025.
Luliana Mihaela et all 2016	Quantitative/cognitive	The concept of digital technology adoption (i.e., perceived usefulness, perceived ease of use, and behavioral intention to use digital tools) comes from the interactions between the predictors (i.e., familiarity with both old and new technology), the mediators (i.e., anxiety and user perceptions of hurdles), and the responder characteristics.
Łukasz Sułkowski , et all 2021	Quantitative/ cognitive, affective, conative	Smart learning, often known as intelligent education, refers to new educational environments in which the student and instructor use existing, innovative technology. This is determined not only by the software and technology available but also by how they are utilized in conjunction in the classroom or via online training.
Lyudmila V. et al. 1 2016	Quantitative/cognitive, affective, conative	A cyber university is a self-learning institution that operates on the basis of a group of like-minded individuals and has a well-established system for quickly adjusting to current economic circumstances. This mechanism requires several requirements, such as the ability to learn, the convergence of relationships, the transfer and development of knowledge, and meeting the needs of the outside world.

Abougalala, R. A., Amasha, A., Areed, M. F., Alkhalaf, S., & Khairy, D. 2020	Quantitative/Cognitive	A cyber university is a small environment in which sensor-enabled and networked devices operate constantly and jointly to offer university students and staff high-level creative, context-aware approaches and applications.
Shoikova et al. 1 2017	Quantitative/Cognitive	Cyber universities are characterized by the substantial use of expert systems for evaluating knowledge development levels in the workplace.
Cocoli et all 2014	Quantitative/cognitive	Universities are now considered smart because they use technology in smart ways to increase the quality of their graduates and their work. Being smart is insufficient for a contemporary university. Universities should improve their competence. By "smarter university," we imply a situation where staff, professors, students, and all other stakeholders can easily share information.
Thimikorov 2015	Quantitative/cognitive & affective	The Cyber University idea entails the complete upgrading of all educational activities.
Li and Wong (2021).	Quantitative	Smart education is a technology-enhanced paradigm that emphasizes using smart pedagogies, technologies, and technical design in learning settings.

Table 4 depicts a variety of brand image concepts in a university atmosphere. Academic institutions, particularly universities, are in the process of developing their brand image, and they are close to commercial companies. Although there is limited evidence that universities are actively engaged in brand image development, it does occur. Brand image, which impacts customers' overall thoughts and sentiments about a brand and consumer behavior, is the primary driver of brand value. Because it plays such a significant part in marketing activities, the notion of "brand image" has gained a lot of traction among academics and practitioners. Building a positive brand image is a continual effort. To create a powerful brand image, considering the full participation and support of all participatory elements, including both external and internal participants, is necessary.

Table 5. Concept of University Brand Image

Authors	Method	Concept of BI
Shankar Singh, U., & Sahin, O 2017	Qualitative	There isn't just one definition; all of them lead to a nearly identical meaning, with the importance of customer happiness and approval of the firm as a brand. Regarding university branding, numerous colleges worldwide are working to differentiate themselves from their competition.

M. T. Nuseir , Ghaleb A. El-Refae , and A. Aljuma 2021	Quantitative	E-service quality, ICT, e-learning, and e-information have positive relations on University BI.
Alkhawaldeh et al. 2020	Quantitative	The main aspect of marketing is brand image, which is a combination of beliefs and feelings that is only susceptible to a cognitive approach. It enables differentiation between goods and services.
Helgesen and Nesset (2007)	Qualitative	Helgesen discovered the beneficial effect of university image on the chance of students enrolling in additional courses at the same institution and continuing their studies. Similarly, Beerli Palacio et al. (2002) observed that students' experiences, knowledge, and feelings toward higher education organizations impact overall perceptions of university image. Brand image is critical for assisting private institutions of higher education in gaining access to brand consideration :
Abdelbaset Alkhawaldeha*, Abdallah Alsaadb , Abdallah Taamnehb and Hussein Alhawamdeh, 2020	Quantitative	Brand familiarity, PSQ = Perceived Service Quality, has a significant relationship with BI= Brand Image, BI gas significant relationship with SS= Student Satisfaction
Jane Hemsley-Brown, University of Surrey TC Melewar, Middlesex University London Bang Nguyen, East China University of Science and Technology Elizabeth J, J Wilson, Suffolk University, 2016	Qualitative	The study's findings show that perceived congruence (functional, symbolic, and self-image) and brand extension legitimacy (regulative legitimacy, authenticity, cultural adaptability, and desirable values to audiences) are the key elements influencing the identity-image relationship. Furthermore, the study emphasizes the need for global marketing exposure, avoiding exploitation, and resource exchange between the satellite branch and the parent to generate brand extension linkages.

From Table 3 and Table 4, we can see that Cyber University is built on several elements defined by the philosophy of digital adoption. Meanwhile, we conclude that a university's brand image is the impression that potential and existing customers have of a university. In other words, the perception of a brand is the focus of the university's brand image. Thus, we propose CUI as the sum of a customer's perception of a brand generated by the interaction of several factors indicated by Cyber University in their mind. The indicators of SU will be discussed in the next

session of the paper (the enablers of CUI). Hence, the first RQ has been answered and will be clearer after discussing the enablers of CUI.

The Enablers of CUI

Brands, according to the American Marketing Association (AMA) in Kotler (1997), are a term, name, symbol, sign, guide, or design to objects designed to offer identification for products or services created or supplied by a vendor or group of sellers and differentiate them from products or services provided by competitors. The American Marketing Association defines a brand as "a name, term, sign, symbol, or design, or a combination of these, designed to identify and distinguish the products or services of a seller or group of sellers." "Although many kinds of literature have proposed brand image definitions, it needs clarification on how to measure the brand image appropriately in a specific framework like Cyber University. This gap is inseparable from the enablers of university brand image, which need to receive more attention, and there is a lack of theoretical models in the literature. As a result, they still need to be better recognized and infrequently utilized, which limits their growth. From this point, we understand that to find the enablers of CUI, other perspectives such as computer, linguistic-semiotic, and psychological are needed to strengthen the theoretical background. According to Stanton & Lamarto (1994:269), a special design or any combination of components distinguishes the products or services supplied. According to Kotler (1997:63), brands are complex symbols that may represent six levels of understanding, including:

- a. Attributes: A brand conveys specific attributes to the consumer's mind.
- b. Benefits (Benefits): Existing qualities must be translated into practical and emotional benefits.
- c. Value (Values): The brand also expresses something about the maker's or producer's worth.
- d. Culture (culture) brands may symbolize
- e. Personality: The brand may have a certain presentation and may be individual.
- f. Users (User) brands may impress certain categories of customers.

The brand image describes a brand's association and customer trust. "brand image" refers to a consumer's visual image of a product. Each person has the same perception of a brand. Competition in the university is getting stricter nowadays, requiring the company to be more creative and make something of a competitive advantage in terms of packaging, products, marketing channels, and image. If the consumer's response to the constant supply of a competitive product is the same thing or ordinary, then consumers will see the brand of a product with different responses.

According to Kotler (1997), the image effectively does three things for a product, that is:

- a. Deliver a single message that strengthens the product's character and proposed mark.
- b. When delivering messages differently, it should be distinct from similar messages from competitors.
- c. Sending emotional power so that it strengthens the affective side of the consumer

Table 6. Enablers of SU, BI, and Digital Adoption

Authors	Enablers	Remarks
Svetlana A, et al., 2019	One of the cyber university indicators is the start level of acquiring the abilities that compose the qualifying structure of academic cross-cultural communication.	CU
Deden Sumirat	Big data, KM, social network applications, the Internet of things, cloud	BI

Hidayat 1,2,* and Dana Indra Sensesuse	computing, mobile, and ubiquitous computing and integration systems are SC components and technologies. The subcomponents of dimensions/areas include smart lifestyle, smart economy, smart education, smart environment, smart transportation, smart people, and smart governance.	
	Researchers advanced symbolic, functional, emotive, experiential, social, economic, self-esteem, personality, corporate, and utilitarian features that may be defined as a dual model of a brand image comprising cognitive or emotive domains.	BI
Matos et al. (2012).	Cognitive, Affective, Conative	BI
(Sultan and Wong 2012, Sultan 2018)	As a result, a brand's image might include both real and intangible clues, such as cognitive and emotional assessments, as well as affective reactions. The present research evaluated the university brand image based on perceived innovativeness, "goodness," and "seriousness" of educational and commercial activities, ethical standards and social responsibilities, possibilities, and personalized attention.	University BI
(Nguyen et al. 2016)	However, the construct of 'brand image' includes technical progress, innovativeness, trustworthiness, product, and customer-centeredness of the brand, and it has been argued that 'brand performance' impacts brand image in the context of various Chinese institutions.	BI
Iuliana Mihaela Lazar, Georgeta Panisoara, Ion Ovidiu Panisoara 2015	The suggested model in digital adoption employs an original pair of external variables, familiarity with conventional instruments used in face-to-face education and familiarity with advanced digital instruments used in education, as the main novelty. Another area of distinction is the utilization of computer anxiety and perceived obstacles as moderating variables.	Digital Adoption (CU initialization)
Shaun Thomson and Jean-Paul van Belle 2015	According to Molla's (2008) Green IT paradigm, green IT drivers are categorized as economic, ethical, responsive, and regulatory. We also analyzed the role of Green IT preparedness factors: institutional,	Green IT Adoption

	organizational, and value network Green IT.	
Ahmad Abu-Al-Aish and Steve Love 2013	Lecturer Influence, Effort Expectancy, Personal Innovativeness, and Service Quality positively affect behavioral intention to use mobile devices in the context of learning adoption.	Mobile Learning Adoption
Mohamed Sarrab, Ibtisam Al Shibli and Nabeela Badursha 2016	The variables of usefulness, ease of use, appropriateness, enjoyment, and economic and social aspects were revealed to have a stronger impact on learners' acceptance of M-learning, which aids and promotes future empirical investigation.	Mobile Learning Adoption
Saleh Alrashed 2020	Community involvement, strategic management, innovation, ecological sustainability, and smart services are among the main business processes for smart campuses. The innermost circle of the communication architecture for smart campuses is made up of data-generating items ranging from mobile phones to transportation to lab equipment.	Smart Campus
Ahmad Samed Al-Adwan, Amr Al-Madadha and Zahra Zvirzdinaite 2018	Several aspects impact students' intent to adopt m-learning, including relative benefit, social influence, complexity, self-management of learning, and perceived enjoyment.	Mobile Learning Adoption
Łukasz Sułkowski, Katarzyna Kolasińska-Morawska, Robert Seliga 3 and Paweł Morawski 2021	The authors believe that three aggregated components—the environment, instruments, and instructors — would define the proposed routes of hi-tech learning technologization.	CU
Mauro Coccoli, Angela Guercio, Paolo Maresca, Lidia Stanganelli 2014	Six key areas, learning, management, governance, social, health, and green, are identified as enablers of smart education.	CU

Table 5 reviews the enablers of SU, BI, and digital adoption as an initialization of SU. Despite the evolved dimensions in SU and BI, a few disadvantages limited the subsequent researchers. These dimensions could have captured the concept and brand image of Cyber University comprehensively. According to Mauro Coccoli, Angela Guercio, Paolo Maresca, and Lidia Stanganelli (2014), a university becomes smart from an organizational aspect when it (i) has less bureaucracy, (ii) allows the production of smart human social capital, and (iii) supports innovative investments that encourage synergy between teaching and research. Meanwhile, according to Ouidad Akhrif et al. (2019), a smart learning system's interaction with the environment should manifest the system's ability to (i) immediately respond to changes in external surroundings, (ii) adapt to changes in environmental conditions, and (iii) improve self-development and self-control and effectively achieve a goal. This research emphasizes the importance of collaboration management between universities and their ecosystems, domestically and internationally, among all university stakeholder groups, including alums and public engagement. As a result, we propose that the notion of brand image be interpreted to imply a combination of the model's four aspects (cognitive, affective, conative, and collaborative). The problem is defined since the framework is the product of a poor definition. Hence, it is essential to redefine "brand image." As a result, based on the preceding brand image definitions, the researchers concluded. CUI should not be merely a sum of associations, as many earlier scholars proposed for BI; it should also not be separable to differentiate between cognitive, emotional, conative, and collaborative components in brand image. Therefore, the researchers defined a unified brand image as "the total of a customer's beliefs about a brand formed by the synthetic interplay of the cognitive, emotive, conative, and collaborative processes in a customer's mind."

DISCUSSION

The study looked at how the Cyber University Image (CUI) construct was defined to accommodate the brand image construct in the Cyber University framework. This study used previous researchers' Cyber University and University Brand Image frameworks to define CUI (Cocoli 2014, Abougala, R. A. 2020). It empirically developed a model of four indicators of CUI (cognitive, affective, conative, and collaborative) that advocated for a consumer-centric and experience-centric branding approach and argued that most consumers do not only buy products but also buy products and experiences together. The items in the cyber university sector are digital infrastructure, digital service, and digital learning, and we approach this study from the perspective of "students as consumers." Indeed, after experiencing infrastructure, service, and learning over time, students decide if the university has a smart image. According to research, traditional branding tactics do not work for smart institutions due to their complexity, digitalization, and inside-out approach to brand creation (e.g., through engaging internal forces to promote brand name) (Whisman, 2009). Even though branding campaigns can raise awareness and define a cyber university's image, research on cyber university branding could be more extensive, highlighting the complexity of university branding (Joseph et al., 2012). The definition and addition of a collaborative dimension to CUI were proposed in this review. Aside from other aspects of university brand image, research has revealed that digital collaboration in cyber-university branding is limited, particularly from an experienced-based standpoint. According to Esraa Bukhari et al. (2021), smart strategies benefit regional university partnerships. This is illustrated by the importance of bridging the gap between academia and industry. Unfortunately, this study did not link collaboration to branding strategy, particularly brand image, in the context of smart universities. Collaboration, on the other hand, is critical in the image of CU because the system's integration of cooperation has led to several successes; it aids in controlling the flow of ideas, organizing roles, and maintaining relationships among the university, stakeholders, and the ecosystem. The smart system has

facilitated the growth of large-scale collaboration. The cyber university has also adapted to these developments, implementing smart interactions to encourage current collaboration techniques among smart learners in groups. To allow for the transmission of knowledge and experience in new forms and with more advanced modes of engagement. The Cyber University (SU) and the integration of service-oriented intelligence have stimulated a new generation of collaborative learning, resulting in a long-term interaction between universities and businesses that is critical in developing skills and competencies. As a result, collaboration as an CUI indicator should rethink branding strategy in a cyber university more systematically and comprehensively.

This research investigates managerial perspectives on the significance of CUI. The placement of a university brand in the minds of major internal and external stakeholders is one of the most critical strategic decisions made by the university administration. According to the research, CUI is ultimately driven by students and all stakeholders and is manifested through cognitive, emotive, conative, and collaborative characteristics. Using a cyber university perspective, the research adds to the literature on historical developments affecting the origins, uses, and meanings of university branding, as well as information on the historical development of the branding and the key causes driving these developments. According to the essay, numerous causes have influenced the branding notion in a significant way. It also provides advice for universities on transitioning from a traditional to a smart system and managing their CUI effectively to get a competitive advantage. Certainly, branding has become a prominent topic among academics and researchers who have done major work in the cyber university arena in recent years.

CONCLUSION AND RECOMMENDATION

Building a new appropriate construction University Image (CUI)- and managing it have become significant components of strategic brand management, as smart universities are increasingly emphasized in academic literature. After screening, our systematic literature review included 54 articles on the use of ICT in higher education and universities and brand image in ICT-based universities. This SLR proposes a new phase of CUI and discusses them in detail by systematically reviewing qualified articles within last year's 2012–2022. To summarize our findings, we grouped these techniques based on their output-specific, association-specific, practical, context-specific, and knowledge-specific aspects. We established a roadmap as a decision-support tool for practitioners and researchers. Despite the contribution of this SLR to enriching the literature, this study certainly has research limitations. The limitation is that only three databases are used in this study, namely Scopus, Emerald, and ProQuest, which leads to the possibility of underrepresentation of the articles reviewed.

Furthermore, further investigation of books, book extracts, or proceedings not included in this SLR might have yielded further insights. CUI research is still in its infancy. Therefore, future research should be directed with much more emphasis on identifying issues and developing strategies.

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