CORPORATE SOCIAL RESPONSIBILITY AND QUALITY MANAGEMENT SYSTEM IN THE CONTEXT OF BLOCKCHAIN TECHNOLOGY

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Abstract

The purpose of this paper is to integrate quality management system, corporate social responsibility guidelines, United Nations Sustainable Development Goals, blockchain related documents and qualitative interview results from Hong Kong and Slovakia to design a set of social inclusive quality indicators within the context of the higher education sector. Three levels for social inclusive quality indicators in relation to blockchain content distribution technology in HE have been identified: governance with transparency, trust building with the sustainable community in needs fulfilment; industry innovations with risk and security audit mechanism. The contribution of this paper is to raise awareness of educators, industry practitioners and policy makers about the importance of social inclusion in blockchain technology. This study fills the gap through integrating system thinking, humanistic thinking and proactive thinking in the higher education context.

Keywords: Blockchain, ISO, CSR, UNSDGs, Social Inclusion, Quality Indicators

1. INTRODUCTION

Upon the emergence of mobile telecommunication products, there is a big change in the way of communication and the level of quality of life. Arguments also appear under the technological explosion in regards to data privacy and protection. It is undeniable that technology can speed up the pace of communication and the speed of delivering products and services. Raturi et al. (2011) mentioned that the life of a learner/ student now was definitely far more comfortable than in the pre-Internet era. "The Internet gave rise to the possibility of a whole new range of online resources. However, the pros and cons of using technological-related resources have been debated." (p. 413) Moreover, Alexander and Yves (2010) mentioned that it is the time to understand and methodically address the challenges of business model innovation." (2010, p. 5) They highlighted that a business model needs to describe the rationale of how an organization creates, delivers, and captures value." (2010, p. 14) In the digital age of today, the aim of the study is to integrate system thinking and innovations in technology, for example, blockchain

content distribution technology from a social perspective for an inclusive community.

Besides creating a new platform of blockchain for data decentralization, policy makers, industry practitioners and end users need to realize the impacts of technology and the growing concerns of United Nations Sustainable Development Goals (UNSDGs) in designing a control mechanism with quality indicators to bring in positive influence to people, planet and profit. According to the definition of the Brundtland Commission (1992) of the United Nations, "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The basic element of sustainability is the economic aspect to support a business in the short term. In the business sector, for example, banking and finance industry, issues related to data privacy and protection, disruptive use of technology to improve the process flow and user experience of receiving products/ services to save time, cost and administration with trust need to be considered in the processes of services design, planning, implementation with performance

measurement. Hence, management of higher education institutions needs to develop some measurable social inclusion quality indicators for the overall performance of the emerging blockchain content distribution technology for the community. The purpose of this paper is to examine how quality management system (QMS), corporate social responsibility (CSR) guidelines, UNSDGs and blockchain related documents integrate to derive a set of social inclusion quality indicators within the context of the higher education sector to measure blockchain related training of higher educational institutions for sustainability. Finally, this study fills the gap through integrating system thinking, humanistic thinking of CSR and proactive use of UNSDGs in the higher education context. The research questions of this paper are:

1) What are the key elements of blockchain content distribution technology in higher education (HE) needed to be monitored for sustainable development?

2) What are the key levels of social inclusion quality indicators for blockchain content distribution technology to meet the needs of the future?

2. BLOCKCHAIN AND SERVICE QUALITY

Kaffman (2015) mentioned that financial technologies involving payment services and business services with mobile phones and new money technology, for example, blockchain have been promoting in past years. Mobile payment and future money with new kind of technologies will be one of the hot issues for the future.

"..as a result, the technology platforms that characterize financial services today are not just two-sided – instead they are multi-sided. This creates issues for financial evaluation, operational performance, technology innovation, firm strategy, and market competition."(Kaffman, 2015, p. 261).

Moving along with new technologies for payments, a new concept of money and the use of blockchain in content distribution, it is time to explore the knowledge, skills, attitudes and values in future education to balance the growth of technology and the needs of a socially inclusive community. Matthews and Foster (2014) brought up that there is nine proposed intelligence of Gardner, a cognitive scientist, to build up a profile of intelligence of which higher education needs to be aware of. The nine intelligence are:

– Linguistic;
– Logical;
– Spatial;
– Bodily-kinesthetic;
– Musical;
– Intrapersonal (or emotional);
– Interpersonal (or social);
– Naturalistic; and
– Existential (2014, p. 14).

The service deliverable of blockchain content distribution technology goes beyond analytical, practical, and creative intelligence or above. De Filippin and Wright (2018) mentioned that the reach of blockchain has rapidly expanded beyond payments and financial products, helping to support new, autonomous systems that structure social and economic interactions with less of a need for intermediaries. Smart contracts are being used to memorialize all or parts of legal agreements., creating commercial arrangements that are dynamic and potentially harder to terminate." (p. 3). They further pointed out that blockchain not only used to store actual information. They can also store references to files available elsewhere, such as on separate peer-to-peer file-sharing or overlay networks. By using overlay networks, blockchain-based systems can manage a greater range of information, including messages, photos, or even videos – without causing a blockchain to grow exponentially. With these capabilities, blockchain technology is supporting new file-sharing applications that are less dependent on intermediaries. These new applications use a blockchain as a resilient and tamper-resistant index of copyrighted works..." (p. 119) Hence, future intelligence also include copyright awareness, corporate governance and internal controls of smart contracts. Educators need to explore the potential and develop the ability of learners to adapt to the disruptions brought by blockchain content-based distribution technology, developing, deploying, maintaining, intervening and shaping the moral and ethical standards of the changes.

Yeung (2010) also pointed out that the educational sector was under public service; and the service industry played an increasingly vital role in the economy of many countries, especially the East. In Yeung's study (2010), there was a growing demand of "social good", "governance structure", "increasing competitiveness", "value for money", "greater access", "efficiency", "accountability", "devolution", "centralized decentralization", and "corporatization" of which these elements are relevant to the service delivery in higher education. Yeung (2010) quoted a study of Husain et al. (2009) about adopting the SERVQUAL model to assess educational service delivery and students' satisfaction. The dimensions that he had adopted were:

– Tangibles – physical facilities, equipment and appearance of personnel;

– Reliability – consistency and reliability of the service performance;

– Responsiveness – staff willingness to help customers and provide prompt service;

– Assurance - knowledge and courtesy of employees and their ability to inspire trust and customer confidence;

– Empathy – human factors in service performance, like caring and individual attention.

Besides SERVQUAL, are there any other better ways to measure the performance of advanced technology of blockchain content distribution technology in a holistic way, addressing the aspects of United Nations Sustainable Development Goals (UNSDGs) systemically? Matthews and Foster (2014) highlighted that a fixed mind set and a growth mind set to lead to different outcomes. Is mind set development also needed to be included when measuring the service quality of blockchain technology? Will ISO 9001 Quality Management System (QMS) requirements, ISO 26000 Corporate Social Responsibility (CSR) guidelines, UNSDGs and white paper of blockchain provide a framework for social inclusion quality indicators of blockchain in the higher education sector?

3. QMS AND CSR IN HIGHER EDUCATION

Fulfilling the requirements of different stakeholders with continuous improvement activities systematically can no doubt help to achieve a higher level of satisfaction. Henderson et al. (2006) highlighted that systematic self-evaluation and benchmarking were important in higher education. They also emphasized that 'constructive alignment' of Biggs' was a fundamental and integral element in the quality model (QM).

Based on the ideas of self-evaluation and constructive alignment, the eight principles of ISO share the same kind of rationale in the quality model of higher education. The eight principles are Leadership, Involvement of People, Factual Approach, Process Approach, System Approach, Continual Improvement, Mutual Benefit Supplier Relationship and Customer Satisfaction. These principles focus on system conformity, continuous improvement and customer satisfaction. The following ISO 9001: 2008 clauses are relevant to the operations of a higher educational institution. Examples are:

3) Clause 4.1 "Quality Management System":
– Outsourcing control;
– Risk and impact;
– Purchasing.
4) Clause 6.4 "Work Environment":
– Tangible: Environmental and other factors – noise, temperature, humidity, lighting or weather.
– Intangible: Synergy, efficiency, effective, psychological, sensitivity, and ergonomics.
5) Clause 8.2.2 "Internal Audit", 8.2.3 "Monitoring and Measuring Process, 8.5.2 and 8.5.3 "Corrective and Preventive Actions", "Impact on conformity to product requirements and on the effectiveness of quality management system"(QMS).

The above examples of ISO 9001: 2008 clauses show that there is a need to balance the hard and soft resources in the operations with consideration of stakeholders for maintaining not only program quality but also institutional system performance.

Apart from ISO 9001, Cajazeira (2008) also brought forward the major principles of ISO 26000 CSR guidelines: accountability, transparency, ethical behavior, consideration for the stakeholders, legality, international standards, and human rights. It is the responsibility of organizations to consider the needs of the stakeholders in the seven aspects when designing work processes or executing business-related activities. In fact, both ISO 9001:2008 and ISO 26000 convey a message that non-economic inputs and soft side of outcomes are the trends of quality management system in organizations, including public service organizations. It is undeniable that ISO 9000 QMS requirements and ISO 26000 CSR guidelines provide a framework on the characteristics of a quality model in higher education:

– Consideration of all stakeholders, for example, learners and teachers, programme accreditation bodies and industry associations, employers in different industries and NGOs in the community for the quality of programmes and performance of graduates;
– Identification and realization of vision, mission and objectives of higher educational institutions;

– Establishment of quality culture with accountability, consistency and transparency; and
– Use of benchmarking exercises for continual improvement in teachers and learners, programmes and services.

However, these do not suffice for blockchain content distribution technology with the characteristics of decentralization, immutable data, and new infrastructure of data storage. "They are resilient and resistant to change and enable people to store nonrepudiable data, pseudonymously, in a transparent manner. Most – if not at all – blockchain-based networks future market-based or game-theoretical mechanisms for reaching consensus, which can be used to coordinate people or machines. These characteristics, when combined, enable the deployment of autonomous software and explain why blockchain serve as a powerful new tool to facilitate economic and social activity that otherwise would be difficult to achieve." (De Filippi and Wright, 2018, p. 33)

4. QUALIFICATION FRAMEWORKS (QF) IN HIGHER EDUCATION (HE)

In line with the UNESCO 1998 publication entitled: "World Declaration on Higher Education for the Twenty-First Century: Vision and Action ", it is believed that all education, including higher education, should serve the needs of economic and vocational development. The declaration of UNESCO highlighted that "new vision of higher education is needed to cater to more diversified categories of people, and of its contents, methods, practices and means of delivery, based on new types of links and partnerships with the community and with the broadest sectors of society." As a result, institutes need to have principles in devising their mission for fulfilling the declaration of UNESCO.

Another objective of education is to equip learners with skills and attitudes for the workplace. Hence, a new requirement on vocational competence has emerged. Bohlinger (2008) mentioned that the introduction of a qualifications framework (QF) is to make national educational systems more transparent, more innovative and more competitive. Besides, it can also help improve the match between the educational system and the labor market. Thus, "QFs are seen as engines of innovation: the point of introducing them is to promote a number of fundamental, long-term reforms." (Bohlinger, 2008, pp. 96) He further pointed out that unlike national QFs, it addresses the priorities of the European Union and does not include binding mechanisms of recognition addressed to individuals.

Recently, Pless et al. (2012) promoted the use of integrated service learning with the involvement of non-governmental organizations (NGOs) and social entrepreneurs to bring insights to learners. "Understanding how participants make sense of and learn from, their experiences abroad provides us with insights into how service learning programs can help managers to develop the knowledge, skills, and mind set that will enable them to successfully support a company's global sustainability and corporate social responsibility (CSR) efforts." (2012, p. 1) Hence, a comprehensive qualification framework needs to embed the rationale of integrated experiential service learning when developing different kinds of skill sets

for learners, aiming to broaden, deepen and expand their horizon with a focus on responsibility and sustainability in this dynamic world.

In Hong Kong, the Qualification Framework (QF) was born in 2008. Based on the information released from the Education Bureau (EDB), the aim of having QF is to help people in Hong Kong to set a goal for life-long learning with qualifications assured through the seven levels of qualifications covering academics, vocational and continuing education. The QF levels help visualize an articulation ladder for the learners. Levels 1- 3 cover programmes at certificate levels while levels 4-7 cover programmes from diploma, the

undergraduate degree to master degree and doctoral degree levels. In each level, there are two to six descriptors under each category to measure the learning outcomes of modules in a programme. These descriptors are classified into the following four categories as shown in the following table of level 5 – undergraduate level provided by The Hong Kong Council for Academic Accreditation and Vocational Qualifications (HKCAAVQ):

- Knowledge & Intellectual Skills;
- Processes;
- Application, Autonomy & Accountability; and
- Communication, IT and Numeracy.

Table 1. Generic level descriptors - Level 5

Knowledge & Intellectual Skills	Processes	Application, Autonomy & Accountability; and	Communication, IT and Numeracy
– Generate ideas through the analysis of abstract information and concepts. – Command wide-ranging, specialised technical, creative and/or conceptual skills. – Identify and analyse both routine and abstract professional problems and issues, and formulate evidence-based responses. – Analyse, reformat and evaluate a wide range of information. – Critically analyse, evaluate and/or synthesise ideas, concepts, information and issues. – Draw on a range of sources in making judgements.	– Utilise diagnostic and creative skills in a range of technical, professional or management functions. – Exercise appropriate judgment in planning, design, technical and/or supervisory functions related to products, services, operations or processes.	– Perform tasks involving planning, design, and technical skills, and involving some management functions. – Accept responsibility and accountability within broad parameters for determining and achieving personal and/or group outcomes. – Work under the mentoring of senior qualified practitioners – Deal with ethical issues, seeking the guidance of others where appropriate.	Use a range of routine skills and some advanced and specialized skills in support of established practices in a subject/discipline, for example: – Make formal and informal presentations on standard/mainstream topics in the subject/discipline to a range of audiences. – Participate in group discussions about complex subjects; create opportunities for others to contribute. – Use a range of IT applications to support and enhance work. – Interpret, use and evaluate numerical and graphical data to achieve goals/targets.

The QF of programmes delivered by institutes is assessed by an independent party named HKCAAVQ through programme validation exercises. The HKCAAVQ was established in 1990 as an independent statutory body to provide authoritative advice to the Hong Kong Government on academic standards of programmes, including sub-degree, and secondary as well as vocational qualifications in the higher education institutions. The role of HKCAAVQ in the QF area is to assure the quality of the learning programmes. As an accreditation authority of QF, the HKCAAVQ assesses the programmes provided by institutes (programme providers) from the following perspectives:

1) Achieving stated educational objectives;
2) Operating learning programmes; and
3) Meeting the required standards to achieve stated learning outcomes with reference to the Generic Level Descriptors (GLD) of QF.

5. QUALITY TOOLS FOR QUALITY INDICATORS

Quality by itself is neutral (Conti, 2013). The value of quality is interpreted from the eyes of customers in terms of fulfilling requirements with unique characteristics of the products and/ or services delivered. Conti (2013) mentioned that the value judgment was always expressed by people and derived by the associated attributes to the word quality. He further pointed out that the scope of the quality management concept suffered from missing strategic content of which many of today's quality

practitioners have tried to identify quality management with defect reduction (doing things right). There is an increasing emphasis on using statistics in reducing variations in processes for maintaining management system performance and for proving a fit-for-purpose system.

The commonly used quality management concepts used in maintaining and improving processes are: Quality Management System (QMS) of ISO 9001, Corporate Social Responsibility (CSR) of ISO 26000, Six Sigma of Quality Function Deployment (QFD) with graphical aid of House of Quality (HoQ) to consider the needs and desires of the customers. The latest initiative of United Nations (UN) is United Nations Sustainable Development Goals (UNSDGs) can be considered as a quality tool to develop a mindset of quality management and sustainable development through integrating UNSDGs into the design of processes and products/ services for building a social inclusion community.

Since the adoption of UNSDGs in New York in September 2015, inclusive community (SDG#16) with the quality of education (UNSDG#4) for economic development (SDG#8) has been mentioned. The application of United Nations Sustainable Development Goals (UNSDGs) into policy-making, product/service design and staff development have become a trend. This paper is to explore the use of a selected theme of UNSDGs, for example, UNSDG 5 Gender Equality and 9 Innovations of blockchain together with ISO 9001, ISO 26000 and blockchain related papers to develop social inclusion quality

indicators. These findings provide a better understanding of using social inclusion quality indicators for working towards UNSDGs via implementing blockchain content distribution technology in the higher education sector.

6. CHALLENGES IN EDUCATIONAL INSTITUTES

For the critics of curriculum, Kelly and Ron (2014) mentioned that responsible management education curriculum must address three foundational challenges in business education if it is to actualize the aspirations of Principles for Responsible Management Education (PRME) of purpose, values, methods, research, partnerships and dialogue: 1) it must confront the cognitional myth that knowing is like looking, 2) it must move beyond mere analysis to systems thinking, and 3) it must transition from a value-neutral stance to a values-driven stance. (2014, p.631) Apparently, they supported to integrate United Nations PRME principles (purpose, values, research, methods, on-going dialogue and partnership), UN initiatives, for example, UNSDGs and sustainable related strategies, for example adoption of ISO 9001 and ISO 26000 into curriculum design of blockchain content distribution technology for using technology proactively in a human-based approach for social inclusion.

Though the quality management system (QMS) requirements and CSR guidelines are commonly used in manufacturing and servicing industries, they are not being practised strongly with the new initiative of UNSDGs in the higher education sector. Educators should increase the exposure of its teaching staff in relation to the new technology of blockchain content distribution technology and to the use of quality concepts in curriculum design for learners to meet the changing needs of the society on top of the Qualification Framework's (QF) generic descriptors used in the educational sector for learning outcomes. Hence, this paper is going to explore the commonalities between ISO, CSR, blockchain related papers and interview results for developing some generic social inclusion quality indicators for deriving a full picture of the performance of applying blockchain in the higher education sector. The research questions are:

1) What are the key elements of blockchain content distribution technology in higher education (HE) needed to be monitored for sustainable development?

2) What are the key levels of social inclusion quality indicators for blockchain content distribution technology to meet the needs of the future?

Based on the triangulation of the related documents and interview on the uniqueness of blockchain content distribution technology, a checklist of social inclusion quality indicators has been designed for sustainable development in higher education. It is recommended to implement a 3-level quality indicator (governance, process, and measurement) for realizing the practicality of the indicators and for the benefit of the learners and the HE community as a whole.

7. METHODS – CONTENT ANALYSIS

Sharda et al. (2013) mentioned that analyzing data could be used to understand customers/ clients and business operations to sustain growth and profitability for enterprises. In fact, data can be found in various forms and fashions. Using timely data can help interpret current phenomena for decision making. They further pointed out the following ways for data mining for the benefits in business sustainability (Sharda et al., 2013, p. 155-156):

1) Association – finding a commonly co-occurring grouping of things for market analysis;

2) Predictions – identifying the future occurrence of certain events based on what has happened in the past;

3) Cluster Information – seeking the nature of groups of things based on their known characteristics; and

4) Sequential Relationship - discovering time-ordered events.

Data can be verbal and non-verbal messages. It represents the ideas of people. If data can be co-ordinated, integrated, or controlled in a meaningful way, the behavior of people or an organization can be understood, predicted and controlled. With the use of content analysis and related qualitative software, for example, NVivo, data can be analyzed and interpreted meaningfully and comprehensively. Content analysis can be regarded as a tool for understanding people's thinking and beliefs, to uncover the methods of persuading people to accept ideas, to differentiate practices among certain groups of people and to see the trend of certain practices. Textual messages are the data that content analysis works with and from which concepts for further analysis are derived.

Content analysis is a systematic and objective analysis of selected text characteristics. It involves counting the number of words and the frequency of different types of words; finding out the characteristics of themes, building relationships among items, paragraphs, and finally establishing meaningful concepts. It is not simply a quantitative research method but also a qualitative one since the purpose of the writing is also understood by doing the analysis. The advantages of content analysis are:

– No people are involved;

– No experiments are required; and

– Texts from the recent past can reflect social phenomena.

However, the content analysis also has limitations. There may be issues relating to the availability of texts and the interpretations may be subjective. In order to guard against undue subjectivity, researchers should follow the advice of Babbie (2001):

– Trace the person or authority composing the documents;

– Think about the reasons behind the existence of the documents;

– Find out the ways of acquiring the information contained in the documents;

– Investigate the magnitude of biases in the documents;

– Identify the main concepts used by the writer; and

– Internalize the concepts that the documents have demonstrated.

In the present research, the key elements found in blockchain content-based distribution technology in higher education will be identified. When undertaking content analysis, the author has been aware of the sampling pattern and the levels of units, that is, the key dimensions of inputs, processes and outputs; and elements of ISO 26000 CSR guidelines in

education for social inclusion with the use of blockchain. The documents were taken from the International Organization for Standardization (ISO) website, the website of United Nations, and the website of Hong Kong Monetary Association (HKMA), Hong Kong to identify the key social inclusion quality indicators in blockchain content-based distribution technology. When undertaking a content analysis for the present research, there were two research objectives:

1) What are the key elements of blockchain content distribution technology in higher education (HE) needed to be monitored for sustainable development?

2) What are the key levels of social inclusion quality indicators for blockchain content distribution technology to meet the needs of the future?

– Step I: Comparing the documents of Whitepaper 2.0 on Distributed Ledger Technology (DLT), Hong Kong Monetary Authority (HKMA) (2017) and United Nations Sustainable Development Goals (UNSDGs) with interview results of blockchain specialists of Hong Kong and Slovakia.

– Step II: Comparing the requirements of ISO 9001 QMS, ISO 26000 CSR, ISO/ TC 307 blockchain and information of step I.

– Step III: Identifying the key social inclusion quality indicators for blockchain the content-based distribution network for resilience.

8. FINDINGS

1) What are the key elements of blockchain content distribution technology in higher education (HE) needed to be monitored for sustainable development?

From Table 2 (in Appendix), the common concerned areas of the three selected quality related documents in Hong Kong (ISO 9001, ISO 26000, ISO/TC 307), UNSDGs and HKMA documents were: governance structure, data privacy and control, audit and security mechanism, demonstrating the characteristics of blockchain content-based distribution technology, for example, transparency, decentralization, immutable data, and value transfer system.

– After comparing the documents of ISO 9001: 2008 requirements, ISO 26000 CSR guidelines, ISO/TC 307, UNSDGs and white paper 2.0 on distributed ledger technology of blockchain, it is demonstrated that ISO 9000, ISO 26000, ISO /TC307 are compatible with UNSDGs and white paper 2.0 in terms of:

– Governance Structure for institutional peace of UNSDG 16 Justice;

– Process and data control for accountability of UNSDG 12 Responsible Production and

– Consumption, 8 Economic Impacts and 9 Innovation;

– Audit mechanism for security, fairness, transparency, time and cost saving, value creation and transfer of UNSDG 3 Well Being and 17 Partnership.

For example, ISO clauses 5.1 (management commitment), 7.2.1 (determination of requirements related to the product), 7.4 (purchase), 8.2.3 (monitoring process) and 8.4 (measurement and analysis). The internationally recognized requirements (ISO) concern how quality policy and objectives drive process and system performance

with documentation and data to measure the accomplishment of the key characteristics of blockchain content distribution technology. However, social inclusion elements of women empowerment, gender equality, human rights, legal and ethical aspects are needed to be included in quality indicators for regulating the end-users and blockchain-based networks for keeping the operations of blockchain content-based distribution technology in a social inclusion way.

The research findings have been summarized as below for research question 2:

2) What are the key levels of social inclusion quality indicators for blockchain content distribution technology to meet the needs of the future?

Three levels for social inclusive quality indicators in relation to blockchain content distribution technologies in HE have been identified: governance with transparency in operations and women empowerment (UNSDG 5) in blockchain content distribution technology-related industries, trust building (UNSDG 3/16) with sustainable community in need fulfillment; industry innovations (UNSDG 9) with risk and security audit mechanism in competency enhancement. Besides, there are two main areas that are worth to be highlighted for the future development of blockchain in HE. They are:

1) Key Elements for blockchain content-based distributing technology in Higher Education

According to the text analysis and interview results, blockchain content distribution technology build trust by design of business model in moving horizon. It helps to establish a trusted platform with immutable data for taking useful actions, for example, social contracts between content producers and consumers, to coordinate social activity, e.g. psychology of safety, to coordinate economic activity, and to link up tokens and operations of expenses in the supply chain of blockchain technology. Blockchain content distribution technology is more effective if steps of establishing a framework are well defined with professionals from different disciplines with consideration of contextual factors to adopt a new environment with key registration for public and/or private accessibility of data.

2) Measuring System Effectiveness

According to Henderson et al. (2006), three key elements of a quality model in higher education were systematic self-evaluation, benchmarking and constructive alignment. ISO 9000 QMS provides a systematic approach with different clauses for organizations to consider in their system implementation while ISO 26000 CSR supplements the contents of implementation which matches the growing concerns of women in technology for management board decision-making and labor force participation via implementing blockchain content-based technology in higher education to increase women competency and employability. It is recommended to have relevant documents in blockchain content distribution technology to show communication with key stakeholders for measuring the competency level of women labor and learners, for example, coding programming skills development with on-going coding programme / management/ review; and the exposure provided to women labors and learners to real world issues related to blockchain, for example, environmental concepts and risk identification and control mechanisms.

9. CONCLUSION, MANAGERIAL IMPLICATIONS AND DISCUSSION

The findings of content analysis on selected documents related to system, blockchain development documents and interview results show that social inclusion of gender equality in the development of blockchain content-based distribution technology in higher education can help to achieve UNSDGs, for example, respecting human rights of learning advanced technology, building a trust and peaceful community with fairness; and escalating the skills development of women in labor force with decision-making opportunity.

Besides, governance structure, policy-making, documentation readiness and review mechanism are the fundamental areas needed to be in place for educating the community about the importance of legal, ethical and copyright standards. The results of this study are in line with the UNESCO publication (2014) on Education for Sustainability (EfS), integration of the principles, values, and practices of sustainable development into the key aspects of education and learning. In fact, the results share the same vision of the declaration of UNESCO (1998) that more diversified categories of people, and of its contents, methods, practices and means of delivery, based on new types of links and partnerships with the community and with the broadest sectors of society are needed. Moreover, this paper brings in significant contributions in developing a set of social inclusion quality indicators to assess the quality performance of higher education institutions with blockchain content-based technology implementation into curriculum or administration. School management, academic and administrative staff members need to apply system thinking, humanistic thinking of teaching and learning, and proactively use of UNSDGs for increasing the level of performance in programme delivery, social responsibility and system performance. Hence, social inclusion quality indicators are the outputs of comparing international standards and blockchain related documents for sustainable development.

The methodological limitations of the study are the use of qualitative data relating to the documents selected for analysis from the perception of the author. Studies using quantitative data might help further our understanding of other relevant quality indicators for sustainability. This paper mainly studied the papers published in relation to quality assurance, programme accreditation, international standards and UNSDGs. Good practices on organizational, teacher and learner quality performances have been studied. It has been recognized that social inclusion quality indicators on blockchain content distribution technology in HE have started to receive increasing interest in the education sector.

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APPENDIX

Table 2. Key social inclusion quality indicators for blockchain content-based distribution network for resilience (Part I)

	ISO	*UN related Documents*	*ISO 26000 CSR / White Paper 2.0 on DLT (HKMA, HK)*	*Interview Results (HK and Slovakia)*
ISO 9001	ISO 9001: 2008 Requirements/ ISO TC 307	Item 1) Report of UNWomen, Training Promises into Action, 2018, US: http://www.unwomen.org/en/digital-library/publications/2018/2/gender-equality-in-the-2030-agenda-for-sustainable-development-2018 Item 2) UNSDGs Information: https://sustainabledevelopment.un.org/sdg5	ISO 26000: 2010 Guidelines https://www.iso.org/iso-26000-social-responsibility.html	Interview Results on Use of Block Chain Technology
4 5.1 5.5 8.4 8.5.1 ISO/TC 307	Quality Management System Management commitment Responsibility, authority and communication Measurement and Analysis Continuous Improvement Blockchain and electronic distributed ledger technologies with experts from 30 countries for future standard development in five areas: Reference architecture Taxonomy and ontology Use cases Security and privacy Identity and smart contracts	Item 1) UNSDG 8 Decent Work and Economic Growth "The global gender pay gap is 23% Women's labour force participation rate is 63% while that of men is 94%"	Dimension 1 - Governance Building social responsibility into an Organization's governance, systems and procedures Improving performance Systematic policies and procedures to government organization and business operations Mechanism of stakeholder communication Compliance of law and regulations A set of rules and policies (written) to govern the organization Internally generated document but made public, mandating how all officers, directors, management, and employees of an organization interact with each other and other stakeholders Encompass business ethics and corporate social responsibility Evaluate business decisions based on what is legal and evaluate a decision on what is right Address issues related to ethics, the responsibility of the Directors, shareholder rights, stakeholders' rights & transparency White Paper 2.0 – Six Control Principles for Financial Services Blockchains Principle 1.1 Governance (governance, law and regulation, standards) "1st Phase – DLT research project (HKMA and ASTRI) form a working group with five banks to study through a Proof-of-Concept (PoC) project on immutable client information, auditable records, consensus process, ledger contents simultaneously synchronized in multiple locations, user privacy …etc. "	Blockchain content distribution technology build trust by design of business model in moving horizon. Blockchain content distribution technology build trust by establishing a trusted platform, e.g. white paper publication. Blockchain content distribution technology can create immutable data for taking useful actions, for example, social contracts between content producers and consumers. Blockchain content distribution technology build trust authority to coordinate social activity, e.g. psychology of safety Blockchain content distribution technology build trust authority to coordinate economic activity, linkage of tokens and operations of expenses in the supply chain of blockchain technology. Blockchain content distribution technology is more effective if the steps of establishing a framework are well defined with professionals from different disciplines. Blockchain decentralised content distribution technology can adapt to new developments with key registration (e.g. Lex Cryptographic)

Table 2. Key social inclusion quality indicators for blockchain content-based distribution network for resilience (Part II)

	ISO	*UN related Documents*	*ISO 26000 CSR / White Paper 2.0 on DLT (HKMA, HK)*	*Interview Results (HK and Slovakia)*
4.1 7.1 8.2.3/4 8.5.1 ISO/TC 307	General requirements (item): - The measure, where applicable - Analysis and improvement - Product Realization - Monitoring Process & Product Measurement and Analysis Continuous Improvement "Blockchain technologies are a means of achieving trust and security when making exchanges, without the need for oversight by a trusted third party, and can be effective building blocks for other initiatives like anti-corruption and fraud prevention.", The Chair of ISO/TC 307	Item1) UNSDG 5 Gender Equality "5.4 Women do 2.6 times the unpaid care and domestic work that men do." UNSDG4 Quality of Education "15 million girls of primary-school age will never get the chance to learn to read or write in primary school compared to 10 million boys. " Item 2) UNSDG 16 Peace, Justice and Strong Institutions	Dimension 2 – Labor practice Conditions of work and social protection Wealth and income creation Social dialogue Health and safety at work Avoidance of complicity Employment and employment relationships Promoting social responsibility in the value chain Due diligence Resolving grievances White Paper 2.0 Principle 2 Interoperability and System Integration Controls 2.1 Security Consideration 2.3 Data Integration 2.4 Security Mechanism	Documents in blockchain content distribution technology that show communication with key stakeholders for measuring the competency level of labour Documents in blockchain content distribution technology that show the types of assessments used to measure the competency level of labour Documents that show blockchain content distribution technology related activities arranged to increase the labours' exposure to real world issues, for example, environmental concepts and risk identification and control mechanisms Documents for the measurement of Block Chain content distribution technology improving labours' competency in coding programme development with policy in place and on-going coding programme/management/ review
4.2 4.2.1 4.2.3 4.2.4 5.2 7.1 8.2.3/4 8.5.1	Documentation requirements General – Documentation Requirements QMS documentation also includes records – More than one documented procedure Control of Documents Only "External documents" relevant to QMS control Control of Records Customer Focus Product Realization Monitoring Process & Product Measurement and Analysis Continuous Improvement	Item 2) UNSDG12 Responsible Consumption and Production Pattern	Dimension 3 - Fair operation Policies and systems on: - Preventing corruption - Preventing engagement in anti-competitive behavior -Considering social, ethical, environmental and gender equality in procurement, distribution and contracting issues White Paper 2.0 Principle 3 Audit Rules 3.1 Immutable Record 3.2 Auditing Smart Contracts Principle 4 Cybersecurity Controls 4.2 Smart Contracts Principle 5 Enhancement of Traditional ICT Protocols 5.1 Security Management	Blockchain decentralised content distribution technology can adapt to new developments with key registration (e.g. Lex Cryptographic) Blockchain decentralised content distribution technology can work with regulation technology to recover faster in cases of risks (e.g. regulatory framework in data privacy) Blockchain content distribution technology is non-judgemental if it is defined with good and improved behaviour via key registration. Documents/ records on complaint cases/ unethical cases in use of blockchain content distribution technology, and issues concerned e.g. outsourcing control e.g. social, ethical, environmental and gender equality criteria in procurement, supplier selection, distribution, tendering policies to prevent corruption and anti-competition
5.1 5.3 5.4 7.1 7.3 7.5.1/2 8.2.3/4 8.4 8.5.1 ISO/TC 307	Management Commitment Quality Policy Quality Objectives Measurement and Analysis Product Realization Design inputs to validation of the change Control & Validate production and service provision Monitoring Process & Product Measurement and Analysis Continuous Improvement	Item 1) UNSDG 9 Industry, Innovation and Infrastructure "Women represent 28.8 of researchers worldwide. Only about 1 in 5 countries have achieved gender parity in this area." Item 1) UNSDG 10 "Up to 30% income inequality is due to inequality within households, including between women and men.	Dimension 4 - Consumer Issues Focus on consumer concerned issues and practices addressing consumers' expectations and needs White Paper 2.0 Principle 3 Audit Rules 3.2 Audit Smart Contracts Principle 6 Business Continuity Planning (BCP) and Blockchain 6.1 BCP Plan White Paper 2.0	Blockchain decentralised content distribution technology can facilitate the new self-contained system to avoid unnecessary administration work. Blockchain decentralised content distribution technology can bring in awareness of developing sufficient quality legal talents for future development Blockchain decentralised content distribution technology can integrate with other technology (e.g. Artificial Intelligent AI) to handle issues in a logical way, for example, clean water for women with health records

Table 2. Key social inclusion quality indicators for blockchain content-based distribution network for resilience (Part III)

	ISO	*UN related Documents*	*ISO 26000 CSR / White Paper 2.0 on DLT (HKMA, HK)*	*Interview Results (HK and Slovakia)*
5.1 5.3 5.4 7.1 7.3 7.5.1/2 8.2.3/4 8.4 8.5.1 ISO/TC 307	"Future standardization in this area can take the development of these technologies to the next step by providing internationally agreed ways of working, stimulating greater interoperability, speedier acceptance and enhanced innovation in their use and application	Women are also more likely than men to live below 50% of the median income."	"Researchers and investors are increasingly interested in the transformative and disruptive of this technology to - enhance customer experience	Policy/ objectives/ measurement/control mechanism for unfair or misleading marketing and information delivered to stakeholders in blockchain content distribution technology? Policy/ objectives/ measurement/control mechanism for complaint cases in issues of stakeholders' concern related to blockchain content distribution technology? Policy/ objectives/. measurement/control mechanism for changes in blockchain content distribution technology affecting the quality of the outputs of technology? Policy/ objectives. Measurement/ control mechanism for the disclosure on the rights and responsibilities of stakeholders in blockchain content distribution technology?
5.1 6.1 8.5.1	Management commitment Provision of Resources Measurement and Analysis Continuous Improvement	Item 2) UNSDG 5 Gender Equality https://sustainabledevelopment.un.org/sdg5 "Women are still underrepresented in managerial positions. In the majority of the 67 countries with data from 2009 to 2015, fewer than a third of senior- and middle-management positions were held by women."	Dimension 5 - Human Rights Due diligence Avoidance of complicity Promoting social responsibility in the value chain Resolving grievances Discrimination and vulnerable groups Fundamental principles and rights at work Employment and employment relationships Human rights risk situations Civil and political rights Education and culture Policies and systems on discrimination issues and rights of resolving grievances, rights of political, economic, social and cultural issues White Paper 2.0 "Researchers and investors are increasingly interested in the transformative and disruptive of this technology to - enable the safe storage of value - increase industry transparency - enhance customer experience	Policy/ objectives/ measurement/control mechanism on equal opportunity and avoidance of discrimination and complicity in the operations of blockchain content distribution technology? Resources deployed to demonstrate the integration of human rights into the operations of Block Chain content distribution technology
4.2.4 5.2 5.3 8.4 7.2.1 8.5.1	Control of Records Customer Focus Quality Policy Measurement and Analysis Determination of requirements related to the product measurement and analysis Continuous Improvement	Item 1) UNSDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable "By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries "	Dimension 6 - Environmental Policies and systems on: - Preventing air, land, water, noise pollution - Minimizing waste - Reducing and reusing energy, water and Materials	Policy/objectives/ measurement/control mechanism for demonstrating the concerns of environmental-friendly concepts in the operations of blockchain content distribution technology for sustainability?

Table 2. Key social inclusion quality indicators for blockchain content-based distribution network for resilience (Part IV)

ISO		*UN related Documents*	*ISO 26000 CSR / White Paper 2.0 on DLT (HKMA, HK)*	*Interview Results (HK and Slovakia)*
4.2.4 5.2 5.3 8.4 7.2.1 8.5.1			White Paper 2.0 "Researchers and investors are increasingly interested in the transformative and disruptive of this technology to - enable the safe storage of value - achieve operational efficiencies - secure cost savings	
5 7.2.1 7.4 8.5.1	Management Responsibility Determination of Requirements related to the product Purchase Measurement and Analysis Continuous Improvement	Item 2) UNSDG 4 Quality of Education "The lack of trained teachers and the poor condition of schools in many parts of the world are jeopardizing prospects for quality education for all. Sub -Saharan Africa has a relatively low percentage of trained teachers in pre-primary, primary and secondary education (44 per cent, 74 per cent and 55 per cent, respectively). Moreover, the majority of schools in the region do not have access to electricity or potable water."	Dimension 7 - Social/ Community Involvement Human development and training in the workplace Employment creation and skills development Decision-making processes and structures Discrimination and vulnerable groups Fundamental principles and rights at work Employment and employment relationships Percentage of operations with implemented local community engagement, impact assessments, and development programmes Operations with significant potential or actual negative impacts on local communities The direct economic value generated and distributed Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation The proportion of senior management hired from the local community at significant locations of operation Development and impact of infrastructure investments and services supported White Paper 2.0 "Researchers and investors are increasingly interested in the transformative and disruptive of this technology to - increase industry transparency - enhance customer experience	Blockchain decentralised content distribution technology can enhance certainty as human behaviour is more transparent with the boundary of coding. Blockchain decentralised content distribution technology can facilitate appreciation of content contributors (authors) with originality for social inclusion, looking at different perspectives. Blockchain decentralised content distribution technology can, to a certain extent, 'read' human behaviour. Blockchain content distribution technology build trust authority to coordinate environmental activity, e.g. mutual platform of sustainable cities of electricity management in smart cities, food waste management, shared data management. Policy/ objectives/ measurement / control. the mechanism for demonstrating the commitment engaging a variety of stakeholders in serving the community with the use of Blockchain content distribution technology, especially in the skill development area with economic, social and environmental impacts to discriminated and/ or vulnerable groups in the community