

# A Proposed Model for Accounting Valuation of Intangibles in the Digital Platform-based Sharing Economy

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**Abstract:** This study proposes a valuation model of the intangible assets/ intellectual capital (IA/IC) in digital platform-based sharing economy companies to prepare effective accounting and management reporting in a company. The study model is based on distinguishing between the increase in net assets that is due to changes in price levels and those that are due to the existence of intangibles of the company. This study develops a model for the valuation of intangibles using the organizational context of digital platform-based sharing economy companies. An empirical study was conducted on Uber Technologies, Inc. The results allow a comparison of the situation of IA/IC in firms and determine whether the increase in the net assets of the firm is due to changes in the general level of prices or that are due to the existence of intangibles of the company, setting up an opportunity to disclose IA/IC. Therefore, this model helps prepare good financial reports which help rationalize decisions related to these companies. The study represents an initial step towards the valuation of IA/ IC in digital platform-based sharing economy companies by applying the proposed model in the valuation of IA/ IC in one of such companies.

**Keywords:** Intangibles; intangible assets; intellectual capital; accounting valuation; sharing economy; digital platform.

## 1 Introduction

The global economy has undergone significant transformations, as highlighted in Roh [1] research, impacting the operations of firms on the international stage. One of the key drivers of this transformation has been the shift towards digital technology, where knowledge assumes a central role, as demonstrated by Xu, Zeng and He [2]. This knowledge resource holds immense value and operates as an intangible asset within organizations. Nevertheless, it's important to note that terms like "intellectual capital," "intangibles," "intellectual assets," and "knowledge capital" are at times used interchangeably with the concept of intangible assets, as observed in the OECD [3] work. Consequently, in the context of this study, all these terms, including intangible assets, will be referred to as intellectual capital (IC), signifying their equivalence.

The sharing economy has become a major force in global economic development. Its impact has been wide-ranging, affecting traditional economic and industrial models in unexpected ways. The sharing economy is still in its early stages of development, but it has the potential to significantly transform the way we live and work. It is a trend to watch closely in the years to come [4, 5].

The sharing economy is a new economic model that goes beyond the model of mass production and consumption. It means that sharing things rather than owning them was an increasing trend as a new paradigm of capitalism. Information and communication technology has supported the growth of sharing systems in particular [1,2]. The economy in its modern sense in the world has become based on the exchange of assets, wealth, services, and knowledge between people connected by open electronic applications, as the concept of the market moved from its traditional form related to the place to the digital space, which changed the concept of work and production [5,6]. So, employment became subjective, not related to a specific place or time. This encourages the availability of an encouraging environment for doing business, stimulating the e-commerce sector, diversifying economic activities, and the spread of the knowledge economy and smart applications [5].

In the era of intellectual capital and the digital sharing economy, the level value of intangible assets in the digital platform-based sharing economy companies tends to grow. The knowledge that company-owned or human resources possess affects the companies' ability to survive and compete [7]. Intangibles have become a vital subject in

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management and accounting research and more specifically in accounting and strategic management [8]. In IAS 38, intangible assets are defined according to their useful life. Intellectual property rights and other rights with a fixed useful life are amortized. According to, IAS 38, an entity must choose either the cost model or the revaluation model for each class of intangible assets. In the revaluation model, intangible assets are recorded based on the fair value, if that fair value can be determined by reference to an active market [9, 10].

Therefore, nowadays, financial reports that focus on accounting disclosure of physical assets have become of limited value to stakeholders in making decisions. This leads to the problem of information inconsistency for stakeholders and negatively affects the value of the financial reports [9]. Hence, the advent of the sharing economy model has given rise to numerous challenges. These challenges necessitate companies to rely on their capacity to assess performance, acquire knowledge, and gain experience, enabling them to confront these evolving market conditions, as elucidated by Sadq, Ahmad, Saeed, Othman and Mohammed [11], Nuryaman [12], and Xu, Zeng and He [2]. Parente, Geleilate and Rong [13] emphasize the importance of comprehending how sharing economy enterprises establish competitive advantages within both local and global markets. Consequently, accounting practices must adapt effectively to the transformations brought about by the digital economy and its technologies, leading to significant adjustments in both the methodologies and approaches applied in the field of accounting science. This adaptation is crucial for preparing comprehensive accounting and management reports that cater to the information requirements of stakeholders, as discussed by Kogut, Janshanlo and Czerewacz-Filipowicz [6] and Cordazzo and Rossi [9].

The valuation of IA/IC poses numerous challenges due to its unique characteristics, as noted by Nancy, Sulistiawan and Rudiawarni [7]. Several studies, including those by Nuryaman [12], Cordazzo and Rossi [9], and Weqar and Haque [14] highlight the diminishing significance of accounting information related to intangible assets. This decline stems from issues surrounding the recognition and assessment of intangible assets within financial statements. The prevailing bias towards tangible assets in investment valuation could result in ineffective policymaking, resource misallocation by managers, and an escalation in the cost of capital for investors, as emphasized by OECD [3]. Furthermore, various findings suggest that financial statements themselves have become less pertinent in terms of value. Consequently, there is a pressing need for accounting methodologies to adapt effectively to the evolving landscape of accounting in the digital economy, as underscored by Cordazzo and Rossi [9]. Therefore, there is a clear imperative to enhance the accounting valuation of IA/IC, particularly within digital platform-based sharing economy enterprises.

Concerning the context of hurdles about how accounting valuation of IA/IC in the digital platform-based sharing economy companies, the research question is proposed to answer in this study: How to valuation IA/IC in digital platform-based sharing economy companies?

Research into the accounting literature, we find that the accounting valuation of intangibles in the digital platform-based sharing economy companies is nascent although relied upon. This study aims to propose a model for valuation IA/IC based on the distinction between the increase in net assets owned by the digital platform-based sharing economy companies that are due to changes in price levels and those due to the existence of intangibles. This leads to prepare effective accounting and management reporting helping a company provides the stakeholder's needs of the information. The stakeholder theory and measurement theory are used to boost the firm value. In addition, the precision of measurement theory applied to intangibles would be sufficient. We proposed a model of IA/IC valuation. To assess the viability of our IA/IC valuation model, an empirical study is conducted. An empirical study was conducted on Uber Technologies, Inc. which is one of the companies of the digital platform-based sharing economy companies.

The findings of this study find the proposed model helps to prepare good financial reports which help in rationalizing decisions related to these companies. The digital platform-based sharing economy companies can be guided by this study in measuring intangibles and determining whether the increase in the net assets of the company is due to changes in the general level of prices or to the existence of intangibles, which helps to rationalize decisions related to these companies. Also, this study can be a nucleus to think about preparing an accounting standard that deals with accounting for IA/IC for digital platform-based sharing economy companies.

This study offers several noteworthy contributions to the existing literature in the realms of IA/IC and the sharing economy: Firstly, it delineates the components of internally generated intellectual assets and establishes the criteria for their recognition within digital platform-based sharing economy companies, subsequently attributing market value to them. Secondly, the model we present serves as a valuable tool for furnishing stakeholders with information to evaluate various facets of intangible assets. By doing so, this research strives to narrow the valuation gap that often exists between the book value and market value of net assets held by digital platform-based sharing economy firms. The third significant contribution lies in the utility of this model for users of financial reports, aiding them in making informed decisions and rationalizing their judgments. Fourthly, the proposed model facilitates the assignment of value to IA/IC, thereby engendering a continuous improvement process aimed at converting intellectual capital into tangible financial gains. Notably, the model put forth in this study minimizes reliance on subjective value judgments and assumptions, enhancing its objectivity and reliability. Lastly, this model provides valuable insights to managers, helping them identify areas that require resource allocation, thereby optimizing decision-making within digital platform-based sharing

economy companies.

The rest of this study is organized as follows. Section two reviews the relevant literature. Section three shows the theoretical underpinnings of this study through a review of the digital platform-based sharing economy, a review of the approaches and models of IA/IC valuation, and theoretical background. Section four introduces a proposed model for the IC/ IA valuation. Section five presents an empirical study- the proposed model test and results. Section six concludes this study and discusses the limitations and directions for future research.

## 2 Literature review

Intellectual capital is a group of intangible assets (resources, capabilities, and competencies) [15], which thanks to knowledge flows dynamically can generate potential to create products that drive organizational performance and value creation. Some researchers e.g., [16] clear that it is the difference between the company's market value and its book value. Xu, Zeng and He [2] clear that there is a difference between the company's market value (represented by the market value of its shares) and the book value of its net assets is due. Part of it is due to market expectations, industry growth, and macroeconomic trends, while the other part is the existence of intellectual capital.

Most of the prior studies divided intellectual capital into three groups [16, 17] namely human capital, structural capital, and relational capital. (1) Human capital represents the value of employees in the company, including knowledge of the employees, skills, experiences, the creative ability of individuals, training, education, and motivation; (2) Structural capital (internal/ organizational capital) is an infrastructure that supports human capital. Structural capital covers each of the intangible factors (e.g. operations, strategies, procedures, patents, copyright, style of management, and software) that remain in the company after leaving employees. In addition, it significantly contributes to business success and performance [7]; (3) Relational capital (external) refers to the company's ability to deal with external stakeholders, which includes customer loyalty, customer satisfaction, relationship with suppliers, brand, reputation, supply, and distribution channels. It includes the relationship of the company with the external environment.

The valuation of IA/IC is very necessary and important to compare different companies, to estimate their true value or even to control their improvement year after year [9]. Additionally, there is a pressing need to enhance the management of a company's intellectual resources, which play a pivotal role in generating value and yielding benefits that ultimately boost the company's overall performance, as highlighted by Nancy, Sulistiawan and Rudiawarni [7]. The ongoing transformation of the global economy, characterized by the shift towards digital technology, underscores the significance of knowledge as the primary resource. This knowledge resource holds substantial value and operates as a crucial intangible asset within organizations. Considering these developments, it becomes imperative for accounting methodologies to adapt effectively to the evolving landscape of the digital economy. A critical challenge lies in reimagining and evolving the methodology for accounting intellectual capital, a topic discussed by Kogut, Janshanlo and Czerewacz-Filipowicz [6] and Xu, Zeng and He [2]. Consequently, intellectual capital needs to be evaluated within this framework.

The existing accounting system, which has been in use for over five centuries, faces numerous shortcomings in accommodating the requirements of modern economic systems. These systems rely heavily on intangible assets such as goodwill, brands, patents, and franchises to create value, as observed by Gogan and Draghici [16].

Accounting focuses on methods of identifying, evaluating, accounting and reporting intangible assets represented in goodwill and research and development costs, while IA/IC (human capital, structural, relational, and goodwill) has not been comprehensively considered [6]. Moreover, this system should provide a comprehensive and in-depth analysis of the firm's performance, taking into account its intellectual capital. This will help to identify potential opportunities for improving the firm's competitiveness [16]. The research into both the sharing economy and intellectual capital is nascent (considering the paucity of research). To date, only a limited number of studies [2, 7, 18] have exclusively analyzed both the sharing economy and intellectual capital separately and were not addressed together in any study.

In this section, the findings of various studies conducted in the past have synthesized the sharing economy and intellectual capital which are classified into two groups. The first group focused on previous studies that have shown the importance of intellectual capital and its issues (e.g. [7, 11, 19]) For example, Nuryaman [12] concludes that there are positive relationships between intellectual capital and profitability. In addition, profitability acts as an intervening variable in a causal link between intellectual capital and company value. Demartini and Paoloni [20] examine the relationships between intellectual capital and operational activities and strategies to achieve the transition from measurement to management regarding Intellectual Capital. Martín-de Castro, Díez-Vial and Delgado-Verde [8] present a quantitative review of the present literature. They identify three major stages of intellectual capital development with the main themes and frameworks for research, as well as their pathway dependencies. In addition, above, four main areas for the current and future development of intellectual capital have been identified: intellectual capital measurement and disclosure, intellectual capital in new business models, and their role in both social capital and human resource practices. Nielsen, Roslender and Schaper [19] note that there were conflicting indications regarding the influences of stakeholders' pressures to report intellectual capital information. While Sardo, Serrasqueiro and Alves [17] show that

intellectual capital has a positive impact on financial performance. Yu, Garcia-Lorenzo and Kourti [21] outline how intellectual capital reporting can go beyond management style and achieve intentional, targeted change by changing the way organizational actors think. Nancy, Sulistiawan and Rudiawarni [7] provide proof that intellectual capital affects positively a firm current and future performance. Also, they indicate that there are challenges to the valuation and disclosure of intellectual capital. Nicolo, Manes-Rossi, Christiaens and Aversano [22] provide evidence about the effect of governance corporate and financial performance (e.g. financial wealth and financial independence), on the level of disclosure of intellectual capital. In the same context, Weqar and Haque [14] examine how intellectual capital affects financial performance. They show that intellectual capital has a weak relationship with profitability and market valuation, but it is a robust predictor of productivity. Kogut, Janshanlo and Czerewacz-Filipowicz [6] clear that neglecting the intellectual capital may lead to many losses at both firm and market levels. Firm-level, this may lead to inefficient allocation of resources and assess its potential and develop its future business [6]. Market level, this may lead to the wrong allocation of resources at the national level [6]. Sadq, Ahmad, Saeed, Othman and Mohammed [11] indicate that intellectual capital helps companies to achieve the requirements of entrepreneurship strategy and companies to stay survive and compete.

Therefore, attention to studying IA/IC elements, methods of valuation, and how to report it helps the administration focus on the development and protection of IA/IC. In addition, it increases the value of stocks and helps increase the efficiency of capital markets by supplying investors with better information. Consequently, reducing the volatility to a minimum leads to reducing the cost of capital in the long term.

The second cluster of studies concentrated on the sharing economy, involving contributions from Xu, Zeng and He [2], Leoni and Parker [18], Zhou and Yin [4], and Garud, Kumaraswamy, Roberts and Xu [5]. In recent times, sharing economy platforms have emerged as prominent hubs for business activities, facilitating global digital interactions and the temporary exchange of underutilized assets, as underscored by Leoni and Parker [18]. The sharing economy can be defined as a system wherein individuals engage in the direct exchange of goods and services through digital platforms. This model is built upon the concept of sharing human and material resources and assets, involving both individuals and private as well as public institutions, as articulated by Garud, Kumaraswamy, Roberts and Xu [5].

Previous research has delved into the business cases within the sharing economy, particularly focusing on social enterprises utilizing collaborative networks within production, consumption, and redistribution platforms. Roh [1] suggests that leveraging Information and Communications Technologies (ICT) for social enterprise innovation can serve as a catalyst for the success of sharing economy ventures.

Parente, Geleilate and Rong [13] highlight how the sharing economy model has spurred the global proliferation of platform-based businesses. However, a consensus is yet to be reached regarding the competitive dynamics and internationalization paradigms prevalent in sharing economy companies.

Buletova and Stepanova [23] emphasize a positive correlation between the sharing economy and sustainable development as emerging trends that promote resource conservation, foster competitive growth in the face of various risks and threats, and encourage digitalization, environmental protection, and collaborative consumption.

Moreover, previous studies have explored governance strategies tailored for the sharing economy. For instance, Vith, Oberg, Höllerer and Meyer [24] present a framework for distinguishing governance strategies specific to the sharing economy, providing nuanced insights into governance-related issues within this context. While Leoni and Parker [18] provide insight into how accounting systems can be mobilized in digital platforms to support their governance through monitoring and control mechanisms for digital users around the world. Further, the prior studies (e.g., [5]) have discussed challenges that sharing economy companies based on digital platforms face in establishing legitimacy for their business models. Xu, Zeng and He [2] delve into the impact of information disclosure on consumer purchasing behavior within the sharing economy platform. They analyze this influence from four key dimensions: the nature of the information, its placement, presentation format, and quantity. Furthermore, previous research indicates that consumer buying behavior is influenced by information emanating from three primary sources: service providers, the platform itself, and fellow consumers within the sharing economy ecosystem. While Zhou and Yin [4] discuss several important aspects of labor accounting in the context of the sharing economy. They conclude that the scope of employment accounting should be expanded, which places higher demands on the method of accounting for labor. In addition, working time should be re-measured, especially indicators that depend on pay time.

The current study contributes to the two groups of prior studies. The previous models have been presented with different approaches, using available information but their results about solutions do not agree. Especially not addressing the valuation intangibles using the organizational context of the digital platform-based sharing economy companies. This study proposes a new model of valuation of IA/IC with public financial data for the digital platform-based sharing economy companies that improves the limitations of previous models. Therefore, this study contributes to the first group by proposing a model for measuring IA/IC that can be adopted by digital platform-based sharing economy companies. Also, to second group by helping users of financial reports in making their decisions and rationalizing their judgments regarding the digital platform-based sharing economy companies. Where the accounting valuation of intangible assets into the digital platform-based sharing economy companies is nascent although relied upon.

Therefore, this study fills the gap of accounting for IA/IC and sharing economy literature through proposing a model for valuation IA/IC which may be creating value in the future. Based on the distinction between the increase in net assets owned by the digital platform-based sharing economy companies that are due to changes in price levels and those due to the existence of IA/IC.

### 3 Theoretical Underpinnings

#### 3.1 *The Digital Platform-based Sharing Economy: An Urban Phenomenon*

The rapid evolution of the business landscape, coupled with advancements in information and communication technology, has facilitated the emergence of the "sharing economy," as highlighted by Roh [1]. This concept has garnered substantial attention from both scholars and industry practitioners, as evidenced by research conducted by Leoni and Parker [18] and Meng, Ng and Tan [25]. The sharing economy represents a novel economic paradigm that transcends the traditional model of mass production and consumption, as elucidated by Chen, Cheng, Edwards and Xu [26]. This transformative shift has given rise to a plethora of companies operating on internet-based platforms, spanning diverse industry sectors and extending their influence globally, as noted by Cui, Hou, Liu and Zhang [27].

The proliferation of sharing systems has been significantly propelled by advancements in information and communications technology (ICT), which simplifies connections among individuals eager to share their belongings. At the heart of the sharing system concept is the idea that extracting value from underutilized goods and services, which remain largely dormant with their owners, is easily achievable [28]. This shift has led to a growing trend where sharing, rather than owning, has become a prominent feature of a new capitalist paradigm. Consequently, with the surge in ICT-based platforms, the sharing economy was anticipated to be an effective solution to many challenges, with businesses adopting sharing economy principles to evolve their business models. Although the terminology surrounding the "sharing economy" has been the subject of ongoing debate, it gained formal recognition when it was included in the Oxford English Dictionary in 2015. According to this definition, the sharing economy is described as "an economic system in which assets or services are shared between private individuals, either freely or for compensation, primarily through the use of the Internet." This definition underscores two critical elements that are incorporated into the current study's characterization of sharing economy firms: (a) the exchange of assets or services among individuals, often for a fee, and (b) the reliance on internet-based platforms to facilitate these transactions.

The widely embraced phrase "sharing economy" is frequently used to encompass a variety of businesses that facilitate interactions between users or tenants and owners or service providers through platforms that operate on a consumer-to-consumer (C2C) basis. Examples of such platforms include Uber and Airbnb. Additionally, it encompasses business-to-consumer (B2C) platforms like Zipcar and WeWork. These platforms empower users to engage in flexible social interactions and access rental [29].

Roh [1] elucidated the key characteristics of the sharing economy business model, which include: (a) a focus on unlocking the value of idle or underutilized assets, (b) consumers paying for temporary access rather than ownership via internet-based platforms, and (c) reliance on network effects and social interactions between users and suppliers for growth. These unique features are crucial in the context of valuing intellectual assets and intellectual capital (IA/IC) in sharing economy firms. Sharing economy companies, by concentrating on digital platform ownership, have their core competence rooted in digitally intermediating the value chain [29]. Their resource allocation priorities centre around marketing efforts, the cultivation of social media profiles, and operational efficiency, all underpinned by robust data analysis, primarily reliant on IA/IC. This business model results in streamlined organizational structures within sharing economy companies, typically divided into platform technology, operations, marketing, and customer service [25]. For instance, Uber, operating in over 60 countries and amassing total revenue exceeding \$4.1 billion in 2019, manages all its operations, including software development, marketing, and legal matters, from its headquarters in San Francisco. In contrast to traditional companies, digital platform-based sharing economy firms focus their endeavors on establishing a virtual marketplace that efficiently connects users with service providers and effectively manages intangible assets, thereby accommodating variations in time, space, and contracts. The accounting valuation of intangible assets in the digital platform-based sharing economy companies is nascent although relied upon. So, this study proposes a model to value IA/IC digital platform-based sharing economy companies to be able to intangible assets management, create and deal with international competitors. This study highlights digital platforms that have reduced transaction costs toward tangible and intangible assets management.

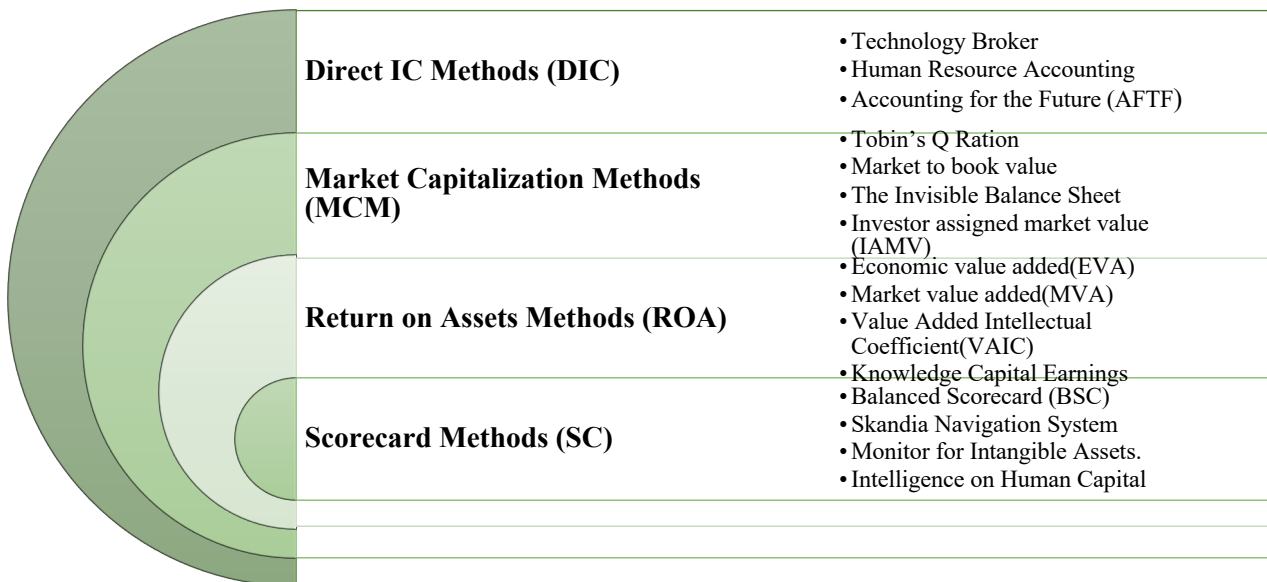
#### 3.2. *A review of the approaches and models of IA/IC valuation*

The prior studies (e.g., [16,17] have agreed on the importance of valuation IA/IC, but they also believe that this valuation is difficult for many of the following reasons: (1) The adoption of traditional accounting on historical financial rules,

indicators and measures that are given a past view, not a future one; (2) Many intangible assets are difficult to measure where the process of knowledge and value creation is difficult to predict its processes and outputs and thus difficult measure it; (3) The special nature of intellectual capital, as one of its components may be of value to a company, while it is of no value to another company, this, in turn, make the process of comparison between companies or sectors a process includes many difficulties and obstacles; (4) The lack of ability to measure and estimate future economic returns with any degree of certainty; (5) The difficulty of controlling each type of intellectual capital; (6) The difficulty in estimating the time of recognition of the operations and events that are included under Intellectual Capital. The challenge of quantifying intellectual capital can be attributed to two primary factors: (a) The first factor pertains to the intrinsic nature of intellectual capital, its multifaceted components, and the complexity associated with gauging when economic events linked to it should be recognized; (b) The second factor is linked to the traditional accounting paradigm, which predominantly adopts a historical perspective and lacks suitable metrics and measures for assessing moral and knowledge-based assets, as well as all facets of knowledge management and value creation activities.

Despite the previous difficulties, the efforts of researchers have been directed towards some attempts to establish reliable approaches or models for measuring capital. Sveiby is one of the first to evolve a method for valuation IA /IC in the 1980s [16]. The current methodologies for assessing intellectual capital can be categorized into four main groups, as discussed by Gogan and Draghici [16], Sardo, Serrasqueiro and Alves [17], and Sveiby and Lloyd [30]: (a) Direct Intellectual Capital Methods: These approaches evaluate the value of intangible assets by explicitly identifying their individual components; (b) Market Capitalization Method: This method calculates the disparity between a company's market capitalization and its stockholders' equity; (c) Return on Assets Methods: These techniques involve various methods for assessing intellectual capital by considering its impact on the return on a company's assets. ; (d) Scorecard Methods: Within this group, methods aim to pinpoint the diverse elements of intellectual capital and generate corresponding indicators, which are then recorded and reported in scorecards.

Effective management depends on effective metering, that is, IA/IC valuation is important for its management. In the context of IA/IC valuation methods, many models have been developed to attain further measurements such as Tobin's Q Ration, Skandia Navigator, Market to Book value, and Market to Book value. The following Figure1 shows approaches and models used in the valuation of IA/IC.



**Fig.1:** Approaches and models used in the valuation of IA/IC.

Source: [30]

Distinguishing between prosperous and average companies hinges on the ability to pinpoint and quantify Intellectual Assets and Intellectual Capital (IA/IC). In Table I, we delve into an examination of established IA/IC valuation models. For each method, we assess various criteria including the primary advocate and the year of initial publication, model classification, the methodology employed, the formula for IA/IC computation, a description of the metric, as well as its strengths and limitations. Table 1 provides a comprehensive overview of IA/IC measurement models, all within the context of the aforementioned criteria.

**Table 1:** The models' analysis for the IA/IC valuation.

Major Proponent and year of first publication	Model Type	Method	Formula Calculation	Description of Measure	Advantages	Disadvantages
<i>Tobin James (1950)</i>	Tobin's q	<b>MCM</b>	$Q = \frac{\text{Market Value}}{\text{Assets Replacement Value}}$	Variations in "q" can serve as a proxy for evaluating the efficacy of a firm's Intellectual Assets/Intellectual Capital (IA/IC). The genesis of this idea can be traced back to the 1950s when James Tobin, a Nobel Laureate economist.	-Offers a global view.	-Beneficial for conducting comparisons among companies. - Challenging to acquire the required data.
<i>Sveiby (1989)</i>	Market to Book value	<b>MCM</b>	$Q = \frac{\text{Market Value}}{\text{Replacement Value of Assets}}$	The distinction between a firm's stock market valuation and its net book value can be attributed to three closely interconnected categories of capital: Human Capital, Organizational Capital, and Customer Capital.	-Generally consistent over time. -Applicable even in cases where the outcomes are unfavorable.	- Does not yield the precise IC value. - Susceptible to variations due to accounting standards.
<i>Stewart (1997)</i>	Calculate Intangible Value	<b>MCM</b>	IA/IC= (the firm's stock market value) – (the company's book value)	This method operates under the assumption that a company's excess earnings, which refer to earnings surpassing those of an average company in the same industry, stem from the company's Intellectual Capital (IC).	Relatively stable	Does not offer a precise IC value. - Obtaining the necessary information can be difficult. - Influenced by market dynamics.
<i>Standfield (1998)</i>	Investor assigned market value IAMV™	<b>MCM</b>	Stock Market Value / [Tangible Capital + Intellectual Capital + Intellectual Capital Erosion + Sustainable Competitive Advantage]	This method defines a company's True Value as its stock market value, which is then divided by the sum of Tangible Capital and the combined value of Realized Intellectual Capital, Intellectual Capital Erosion, and Sustainable Competitive Advantage (SCA).	Considers the company's true value to be its stock market valuation.	-Weak financial analysis. - Hard to obtain the necessary Information.
<i>Edvinsson and Malone (1997)</i>	Skandia Navigator	<b>SC</b>	IC = HC + SC	Intellectual capital is measured through the analysis of up to 164 metric measures (91 intellectually based and	-Integrates financial components. - Offers a more	- Requires experienced personnel for implementation. -Lacks analysis of

		<b>SC</b>		73 traditional metrics) that cover five components: (1) financial; (2) customer; (3) process; (4) renewal and development; and (5) human.	comprehensive perspective on the company.	synergies between different areas.
<i>Kaplan and Norton (1992)</i>	Balanced Scorecard (BSC)	<b>SC</b>	IC = Perspective of the client + Internal perspective + Perspective of the employee + Financial perspective	A company's performance is evaluated through a set of indicators that encompass four primary focus perspectives: (1) financial perspective, (2) customer perspective, (3) internal process perspective, and (4) learning perspective. These indicators are aligned with the firm's strategic objectives. The Balanced Scorecard (BSC) has emerged as the predominant tool for managerial control and assessment of performance.	- Focuses on addressing the needs of stakeholders. -Applicable to both companies and various organizational units.	- Weak financial analysis. - Rigid model
<i>Sandvik (2004)</i>	Business IQ		IC = Identity Index + Human Capital Index + Knowledge Capital Index+ Reputation Index.	combination of four indices; Identity Index, Human Capital Index, Knowledge Capital Index, Reputation Index. Developed in Norway by consulting firm Humankapitalgruppen.	- A more expansive perspective on the company.	- Difficulty in acquiring the required information. - Insufficiently robust financial analysis.
<i>Stewart 1991</i>	Market value added	<b>ROA</b>          <b>ROA</b>	MVA = Market value – invested capital	Market Value Added (MVA) is a financial metric that illustrates the distinction between a company's market worth and the combined capital supplied by its investors, encompassing both bondholders and shareholders. Put simply, it represents the market value of a company's debt and equity minus the total value of all financial	- Enables the identification of IC. - Incorporates sector expectations.	Inapplicable at the level of individual business units. -Not suitable for companies not listed on the stock exchange.



				claims held against the company.		
<i>Stern &amp; Stewart (1997)</i>	Economic Value Added (EVA™)	<b>ROA</b>	<p><math>EVA = NOPAT - (WACC^* \times \text{capital invested})</math></p> <p>Where NOPAT = Net Operating Profits After Tax</p> <p><math>WACC = \text{Weighted Average Cost of Capital}</math></p>	<p>computed by modifying a company's reported profit to account for expenses associated with intangible assets. Fluctuations in EVA offer insights into whether a firm's intellectual capital is generating value. EVA is a proprietary metric owned and endorsed by the consulting firm Sternstewart, and it has gained widespread adoption as one of the most frequently employed evaluation methods.</p>	<p>-Facilitates the analysis of individual business units.</p> <p>-User-friendly and suitable for conducting comparisons .</p>	<p>-Does not take into account future performance.</p> <p>-Requires business profitability to surpass financing costs.</p>
<i>Lev (1999)</i>	Knowledge Capital Earnings		<p>MV (Market Value) divided by CV (Comprehensive Value), where:</p> <p>MV is calculated by multiplying the number of shares available on the market by the unit price of a share.</p> <p>CV is determined by adding the Book Value (BV) of a company to its Intellectual Capital Value (ICv).</p> <p>So, MV is being compared to CV to assess a company's market value in relation to its comprehensive value, which accounts for both its tangible (BV) and intangible (ICv) assets.</p>	<p>Knowledge Capital Earnings are determined by considering the segment of normalized earnings, which incorporates data from the 3-year industry average and consensus analyst future estimates, that exceeds the earnings associated with book assets. These earnings are subsequently employed in the capitalization of Knowledge Capital. In essence, this approach quantifies the earnings derived from intangible assets and uses them to assess and build the value of Knowledge Capital.</p>	<p>Importance of the intellectual Property</p>	<p>Acquiring the essential information proves challenging.</p>
<i>Nash H.</i>	Accounti	<b>DIC</b>		This is a system based	Establishing	Different criteria

(1998)	ng for the Future (AFTF)	DIC	AFTF value added = AFTF value at the end - AFTF value at the beginning of the period	on projected discounted cash flows. The key metric is the difference between the AFTF (Accumulated Future Total Flow) value at the end of a given period and its value at the beginning of that period. This difference represents the value added during that specific time frame.	a smart entity tasked with overseeing the company's cash flows.	are used by different auditors
Brooking (1996)	Technology Broker		IC = HC + Infrastructure assets + Intellectual property assets + Market Assets	Value of IA/IC of a firm is assessed based on diagnostic analysis of a firm's response to some questions covering four major components of intellectual capital: Market Assets, Human-centred Assets, Intellectual Property Assets and Infrastructure Assets. The base of the develop of the Technology Broker method is that the market value of a company is the result of the addition of tangible assets and intellectual capital.	- The model assesses the Intellectual Capital (IC) of the company, emphasizing the significance of intellectual property..	Subjectivity in transforming quantitative results into Qualitative.
Johansson (1996)	Human Resource Costing & Accounting		(the contribution of human assets held by the company) ÷ (capitalised salary expenditure).	This method calculates the concealed or not readily apparent impact of costs related to (HR) that can diminish a firm's profits. To account for this impact, adjustments are made to the company's Profit and Loss (P&L) statement, revealing the true financial implications of HR-related expenses on the bottom line.	Importance of intellectual property	The presence of subjectivity when converting numerical findings into descriptive insights.

Despite the large number of models used in valuation IA / IC have been presented with different approaches, using available information but their results about solutions do not agree. All previous models that have been presented have ignored an important hypothesis, which is that the increase in occurs in the net assets of the firm can be due to other reasons not related to the IA/IC as changes in the level of prices. In addition, they did not consider the IA / IC that have emerged under the sharing economy and digital platform-based sharing economy companies. Despite the shift in the digital economy era, the accounting valuation of intangible assets in digital platform-based sharing economy companies is emerging though reliance on it. The accountants are still working on industrial-age assumptions that place tangible assets and their role in creating value for the firm, but this will lead to the failure of economic units. Incorrectly attribute

all differences between the book value and the market value of IA / IC that have not been recognized in the balance sheet, and this difference includes, in addition to the value of this asset, the effect of inflation and the effect of economic and political decisions. Consequently, another model should be established that can record, analyze, and evaluate intangible assets.

Based on the foregoing, there is the need to reflect on the concept used the value of the firm expresses the real amount equivalent to it as a whole and is not limited to a total not only what you own of physical assets, but it must also include intangible assets and the knowledge. In general, the required change in accounting due to environmental changes and economic changes is concentrated in both the valuation and disclosure functions to measure and display the correct value of the firm. The valuation is the 'core', useful for discovering the unseen value-generating assets on the company's balance sheet. Consequently, there is an urgent need to search for methods or approaches for valuation and reporting these IA / IC especially which is owned by the digital platform-based sharing economy companies. So, this study proposes a model to value IA/IC digital platform-based sharing economy companies to be able to intangible assets management, create and deal with international competitors.

### 3.3. Theoretical background

The concern in intangibles has increased by organizations, due to the essential role they play in generating value for the firm, allowing it to achieve future gains and successes, especially in light of the sharing economy. For external verification, pressure is increasing on firms to assess and report the value of IA/IC Which will eventually influence IA/IC strategies for firms. Nazari and Herremans [31] point out that IA/ IC valuation is essential for the firms through three essential reasons: (a) Strategy, (b) Impact on behavior; and (c) External validation. One of the difficulties faced by these firms is how to convert this asset into quantitative values and measurable monetary units [5].

Therefore, the theoretical background of this study mainly lies in two theories: stakeholder theory and Measurement theory. The stakeholder theory is widely used in the literature accounting justifying firms' disclosure of IA/IC in their annual reports [32]. According to this theory, managers must set and perform strategies to satisfy stakeholders in a way that ensures the success of the company in the long term [32]. This study, in line with the stakeholder theory, that the companies use their physical, financial, and intangibles to boost the stakeholder value (shareholders, employees, customers, government, etc..).

Measurement theory is one of the branches of applied mathematics. This theory encourages reflection on the meaning of the data [33]. Measurement theory works to separate real-world entities to be measured as "represented" and then a numeric system to provide values for the entities to be measured and the relationships between those values. Therefore, the precision of measurement theory applied to intangibles would be sufficient. Some prior studies (e.g. [34, 35]) have employed this theory in the valuation of IA/IC.

Pike and Roos [34] proposed five criteria for the measurement of intangible assets, drawn from measurement theory: Completeness, Distinctness, Independence, Agreeability, and Commensurability. These criteria necessitate adherence to a ratio scale and normalization onto a shared scale to ensure the validity of measurements. Adhering to these conditions is essential to eliminate any potential ambiguity. This implies that detailed assessments or the use of indicators lacking repeatability and alignment with foundational data are not considered suitable. This approach is crucial for upholding transparency in markets and fostering trust in the accuracy of data and information.

The model of this study is a useful tool that provides information for assessing various aspects of intangibles in firms according to measurement theory. The results allow a comparison of the situation of IA/IC in firms in different countries and industries, setting up an opportunity to disclosure IA/IC.

Concerning the context of obstacles to how accounting valuation of IA/IC in digital platform-based sharing economy companies, the current study proposed a model for the valuation of IA/IC in digital platform-based sharing economy companies. The proposed previous models do not consider the increase due to the change in price levels. The study model arises as a necessary due to the following reasons:

- 1- The proposed previous models do not consider the intangibles that have emerged under the sharing economy and digital platform-based sharing economy companies.
- 2- Misattribute any variances between the book value and market value of intangible assets that haven't been acknowledged in the balance sheet. This distinction encompasses not only the value of the asset but also factors in the influence of inflation and the consequences of economic and political decisions.

## 4 A proposed model for the IA/IC valuation

Previous studies contribute a lot to IA/IC valuation from various perspectives, but unfortunately, IA/IC valuation methods have been slow-developing and inappropriate for digital platform-based sharing economy companies.

The aim of the proposed model is valuation IA/IC for digital platform-based sharing economy companies. In addition,

determining whether the increase in the net assets of the company is due to changes in the general level of prices or to these internally generated IA/IC, which helps to rationalize decisions related to these companies and increase the value of the entity.

#### 4.1 *The proposed model characteristics*

The proposed model exhibits the following characteristics:

- 1- **Distinguishing Net Asset Growth:** The model differentiates between net asset growth resulting from price level changes and that attributed to Intellectual Assets/Intellectual Capital (IA/IC).
- 2- **Integration in Reporting:** It integrates IA/IC into economic and financial reporting, recognizing its critical role in navigating a dynamic business environment.
- 3- **Market Value Comparison:** The model primarily employs the book value versus market value approach, deemed the most suitable for IA/IC valuation.
- 4- **Value Assignment:** It assigns a monetary value to IA/IC, involving a continuous improvement process to convert them into tangible financial gains.
- 5- **Facilitates Comparisons:** It enables comparisons between actual business situations and the dynamics of IA/IC.
- 6- **Objective and User-Friendly:** This model avoids heavy reliance on subjective judgments and assumptions, making it user-friendly.
- 7- **Holistic Valuation:** It considers the comprehensive valuation encompassing both financial and non-financial indicators pertinent to IA/IC elements.
- 8- **Relevance to Digital Economy:** Tailored for digital platform-based sharing economy companies, assisting financial report users in decision-making and judgment rationalization.
- 9- **Monitoring IA/IC Dynamics:** It facilitates comparisons across diverse business scenarios while emphasizing the monitoring of IA/IC dynamics.
- 10- **Stakeholder Information:** The model offers relevant information to stakeholders, aiding them in assessing a firm's performance.
- 11- **Value Maximization:** It represents an effort to gauge the extent to which IA/IC contributes to maximizing firm value.

#### 4.2. *Setting the dimensions of IA/IC*

The proposed model depends on the division of IA/IC into four groups, namely, human capital, structural capital, innovation capital, and relational capital as shown in Figure 2.

##### ***Human capital***

Human capital is the knowledge, skills, abilities, and experiences of the firm's personnel. That is, it is the individual tacit knowledge embedded in the minds of the employees. Human capital is important as the primary source of innovation and strategic renewal for a firm. It can be defined as a combination of an employee's attitude, behavior, innovation, and ability to accomplish practical tasks. Hence, an entity can achieve and innovate value.

##### ***Structural capital***

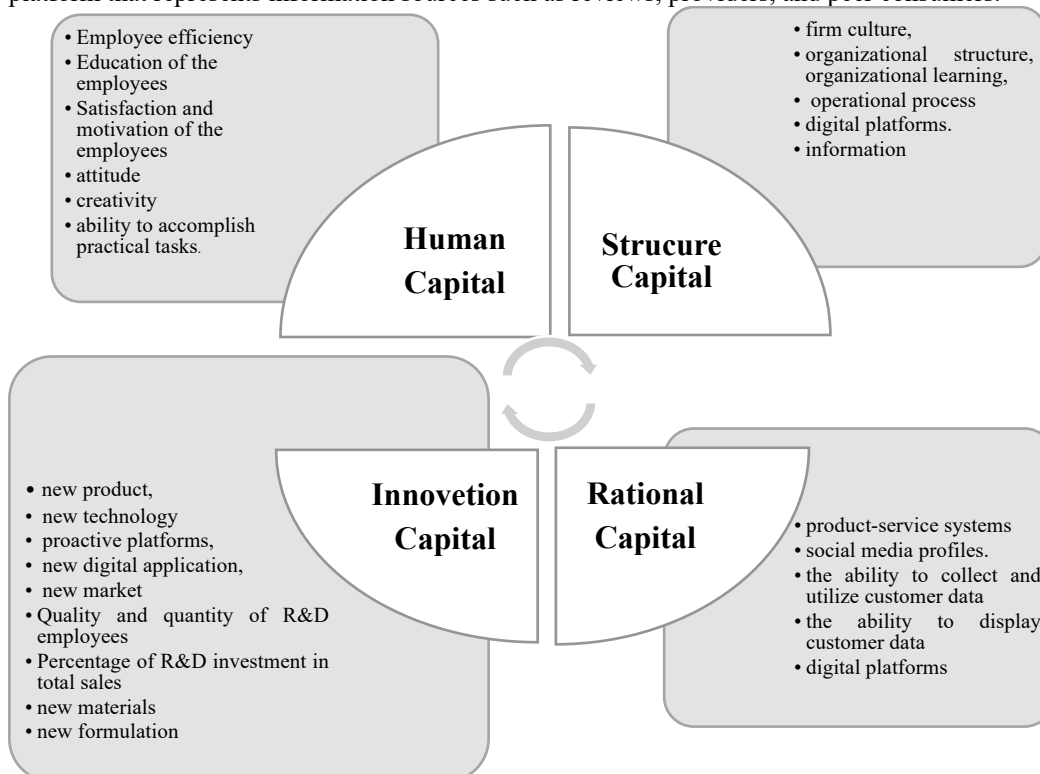
Structural capital pertains to the organization and framework of a company. It is represented in organizational procedures, databases, digital platforms, organizational culture, and the ability to use information technology in response to the various changes that occur in the internal and external environment. It is the business process. Structural capital can be classified into the firm culture, organizational structure, organizational learning, operational process, digital platforms, and information.

***Innovation capital***

Innovation involves the introduction of new elements a production system of a new set of factors essential to production. It includes new products, new technology, proactive platforms, new digital applications, new markets, new materials, and new formulations. Innovative capital represents the competence of planning and implementing research and development, tirelessly introducing new technology, digital platforms of applications, and novel products to fulfil customer requirements.

***Rational/Customer capital***

Relational/ customer capital is categorized by core marketing ability, market intensity, and customer loyalty. It is the value embedded in the marketing channels and relationships that an organization develops through running the business. To boost market share and customer loyalty, the company ought to strengthen its fundamental marketing capabilities., such as the ability to display, the ability to collect and utilize customer data. Relational/ customer capital includes the knowledge and skills that help a firm build distinguished relationships with its customers and suppliers, which will have a positive impact that supports its competitiveness. Moreover, product-service systems enable individuals to share various products owned by either companies or private individuals, along with social media profiles. In addition, a platform that represents information sources such as reviews, providers, and peer consumers.

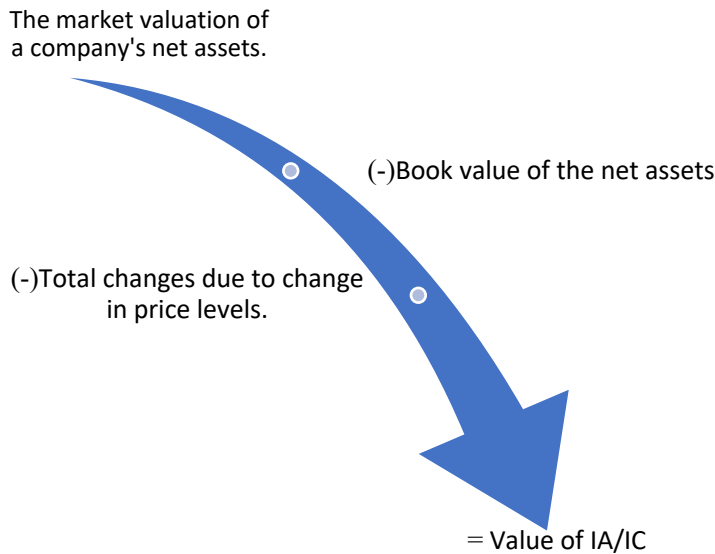


**Fig.2:** The dimensions of IA/IC in digital platform-based sharing economy companies.

This proposed division achieves many advantages, the most important of which are the following:

1. It does not depend on personal judgment when calculating the total value of IA /IC.
2. Provides indicators from which to infer the presence or absence of IA /IC in the organization.
3. Assist in the accounting measurement of each item of IA /IC.
4. This model achieves the possibility of comparison between business realities and IA /IC dynamics.
5. It helps in explaining the different elements that help to form each header item IA /IC money alone.
6. It helps in explaining the various elements that help in forming IA /IC items.
7. It corresponds to digital platform-based sharing economy companies to help users of financial reports in making their decisions and rationalizing their judgments.

Thus, the proposed model for IA/IC valuation achieves integration and structuring for intangible assets to business success in an increasingly dynamic environment through carrying out as follows:



**Fig. 3:** the proposed model formula for valuation IA/IC.

Therefore, the formula IA/IC are designed according to the following:

- 1- Calculate the market value of the company's net assets by multiplying the average trading price of the stock during the period by the total number of stocks traded during that same period, then taking the weighted average of these values.
- 2- Calculate the book value of the net assets of the company, which is equal to the average book value Company's assets - the average book value of its liabilities.
- 3- Calculate the change in the capital due to the change in price levels, which is equal to the rate of inflation x the average capital during the period.
- 4- Calculate the change in retained earnings and reserves that is due to the change in the levels of prices during the period, which is equal to the average of retained earnings and reserves ( $\times$ ) the rate of inflation during the period.
- 5- Calculate purchasing power gains or losses for monetary items, which is equal to (the value of monetary assets at the beginning of the period + the increase or decrease in monetary assets during the period)  $\times$  inflation rate - the value of monetary assets at the end of the period.
- 6- Calculate the change in net income due to changes in price levels, which is equal to the net income adjusted by the effect of price changes ( $\pm$ ) purchasing power gains or losses for monetary terms.
- 7- Calculate the total change due to changes in price levels, which is equal to the change in the capital due to the change in price levels (+) the change in retained earnings due to the change in price levels (+) the change in net income due to the change in price levels.
- 8- Calculate the value of IA/IC, which is equal to the market value of the company's net assets - the book value of the net assets of the company (-) total changes due to changes in price levels.

The following table 2 shows the variables of the proposed model.

**Table 2:** the variables of the proposed model.

Model variables	Code	Definition
The Market value of the net assets	MV	MV= the weighted average of the number the average trading price of the stock during the period $\times$ stocks traded during the period.
Book value of the net assets	BV	BV= the average book value Company's assets - the average book value of its liabilities.
Change in capital	$\Delta Ca$	$\Delta Ca$ = the rate of inflation x the average capital during the period.

Change in retained earnings	$\Delta RE$	$\Delta RE = \text{the rate of inflation} \times \text{average of retained earnings.}$
Purchasing power gains or losses for monetary items	PPG/L	$= [(\text{the value of cash assets at the beginning of the period} \pm \text{the increase or decrease in monetary assets during the period}) \times (\text{inflation rate} + 1)] - \text{the value of cash assets at the end of the period.}$
Change in net income	$\Delta NI$	$\Delta NI (\text{Change in net income due to changes in price levels}) = \text{the net income adjusted by the effect of price changes} \pm \text{purchasing power gains or losses for monetary terms.}$
Total change	$T\Delta$	$T\Delta (\text{total change due to changes in price levels}) = \text{change in the capital} (\Delta Ca) + \text{change in retained earnings} (\Delta RE) + \text{change in net income} (\Delta NI)$
Intangible assets/ Intellectual capital	IA/IC	Value of IC/IA = the market value of the company's net assets (MV) - the book value of the net assets of the company (BV) - total changes due to change in price levels(T $\Delta$ ).

### 5 An empirical study- the proposed model test and results

This study proposes a new model of valuation of IA/IC with public financial data for the digital platform-based sharing economy companies, that improves the limitations of previous models.

This study uses a sample of companies that belong to the digital platform-based sharing economy companies.

In collecting data, we relied on the financial statements and supplementary notes to Financial Statements for Uber Technologies, Inc, which were published on their websites during the period of the year 2019. Where Uber operates in more than 60 countries and achieved total revenues of more than \$4.1 billion in 2019, through coordinating all operations such as software development, marketing, and legal issues from its San Francisco headquarters.

To test the feasibility of the proposed model of IA/IC valuation empirical study has been done. An empirical study was conducted on Uber Technologies, Inc.\* for two reasons. First, it is easy to collect data. Second, it is one of the largest successful companies that belong to the digital platform-based sharing economy companies. Table 3 and Table 4 show IA/IC valuation by the proposed model.

**Table 3:** The proposed model inputs for IA/IC valuation.

(In millions, except share amounts which are reflected in thousands, and per share amounts)

Variables/items (2019)	Amount (Millions of US \$) except per share data
Total assets at the beginning of the period	2388
Total assets at the end of the period	31761
Average book value of assets	$(2388+31761)/2= 17074.5$
Total liabilities at the beginning of the period	31373
Total liabilities at the end of the period	16889
Average book value of liabilities.	$(31373+16889)/2=24131$
Average number of shares traded during the period	1.248
Average trading price of the stock during the period	35.5377
Capital at the beginning of the period	668
Capital at the end of the period	30739
Average capital during the period	$(668+30739)/2= 15703.5$
Retained earnings at the beginning of the period	-7885
Retained earnings at the end of the period	-16362
Average retained earnings during the period	$(-7885+)-16362)/2= - 12123.5$
Net income	-8506
Cash on hand at the beginning of the period	6473
Cash on hand at the end of the period	11412
net increase or decrease in cash on hand	4939
the rate of inflation during the period	2.3%

\* Uber is an American technology company. Its services encompass ride-hailing, package delivery, couriers, food delivery, freight transportation, electric bicycle, and motorized scooter rental.

**Table 4:** IA/IC Valuation by proposed a model.

Variables (2019)	Code	Amount (Millions of US \$) except per share data
Market value of the net assets	MV	$1.248 \times 35.5377 = 44.3510496$
Book value of the net assets	BV	$17074.5 - 24131 = -7056.5$
Change in capital	$\Delta Ca$	$15703.5 \times 2.3\% = 361.1805$
Change in retained earnings	$\Delta RE$	$-12123.5 \times 2.3\% = -278.8405$
Purchasing power gains or losses for monetary items	PPG/L	$[(6473 + 4939) \times (2.3\% + 1)] - 11412 = 262.476$
Change in net income	$\Delta NI$	$[-8506 \times 2.3\%] + 262.476 = 66.838$
Total change	T $\Delta$	$361.1805 + (-278.8405) + 66.838 = 149.358$
Intangible assets/ Intellectual capital	IA/IC	$44.3510496 - (-7056.5) - 66.838 = 7034$

Tables 3 and 4 show the result the of empirical study. The actual disclosed value of intangibles (which is prepared in accordance with generally accepted accounting principles and financial and international accounting standards) in the balance sheet of Uber for the fiscal year 2019 is 238. Whereas the value of intangibles IA/IC that was reached through our proposed model is  $[44.3510496 - (-7056.5) - 66.838 = 7034]$ . Thus, it becomes clear that there is a difference between the two values, due to there is another part of IA/ IC not recognized in the company's financial reports. Where can be explained as the actual recognized value in the balance sheet includes both patents and goodwill associated with procurement and capitalized research and development costs. While the difference is in the other part not recognized in the company's financial reports such as customer relationship, company reputation, employee experience, knowledge, branding, online platforms, and other digital assets. As a result, this study allows reconciling the use of financial measures for the management of IA/IC. Also, it assesses the relative position of the firms, so that intangibles can be reallocated more effectively. In addition, it helps provide information to managers to identify the areas with the greatest need for resources using financial data.

The current model serves as a valuable tool. that provides information for evaluating different aspects of intangibles in firms. The results allow a comparison of the situation of IA/IC in firms in different countries and industries, setting up an opportunity to disclose IA/IC.

## 6 Conclusions

The sharing economy represents an innovative economic paradigm that surpasses the traditional model of mass production and consumption. It is intricately linked to a pivotal facet of global economic evolution, the shift towards digital technology, wherein knowledge takes center stage as the primary resource [2]. This resource holds significant value and operates within companies as an intangible asset. The level value of intangible assets in the digital platform-based sharing economy companies tends to grow. While the financial reports that focus on accounting disclosure of physical assets have become of limited value to stakeholders in making decisions. This leads to the problem of information inconsistency for stakeholders and negatively affects the value of the financial reports [9]. Hence, with the emergence of the sharing economy model, many challenges arise. Therefore, accounting must respond appropriately to developments in the digital economy and its technologies.

The aim of this research is to put forth a model for assessing the worth of intangible assets, specifically within the organizational framework of companies operating in the digital platform-based sharing economy. The proposed model is based on distinguishing between the increase in net assets that is due to changes in price levels and those that are due to the existence of intangibles of the company. This study agrees with previous studies [9, 12, 14] that the significance of accounting information pertaining to intangible assets has diminished, primarily due to challenges associated with the recognition and valuation of these intangible assets in financial statements. This study is consistent with the findings from Pike and Roos [34] and Raut, Brito and Pawar [35] the large number of models used in the valuation IA / IC it has limitations. The study results show that they do not consider the increase due to the change in price levels. Moreover, they did not consider the IA / IC that have emerged under the sharing economy and digital platform-based sharing economy companies.

The results of this study are in line with [6, 14] that the attention to studying IA/IC elements, methods of valuation, and how to report it helps the administration focus on the development and protection of IA/IC. In addition, it helps increase the efficiency of capital markets by supplying investors with better information. The findings of current study align with the conclusions drawn by Xu, Zeng and He [2] regarding the critical role of information disclosure in shaping consumer purchasing behavior within the sharing economy platform. This influence operates through four distinct dimensions: what, where, in what form, and how much information. The results of this study represent an initial step toward valuation IA/ IC in the digital platform-based sharing economy companies by applying the proposed model in



the valuation IA/ IC which helps in rationalizing decisions related to these companies. The results allow a comparison of the situation of IA/IC in firms in different countries and industries, setting up an opportunity to disclose IA/IC. The limitations inherent in several previous models have been relaxed by the model proposed for this study. The proposed model is based on the distinction between the increase in net assets that is due to changes in price levels and those due to the existence of IA/IC. The proposed model is based on the total valuation due to the difference in perspectives about the nature, content, and importance of financial, and non-financial indicators that can be used in valuing the elements of IA/IC and judging its efficiency and effectiveness. This model is a useful tool that provides information for assessing various aspects of intangibles in firms in different countries and industries. Future studies might focus on analyzing the volatility and expand current international business theories using the sharing economy phenomenon. The findings of this study carry certain implications for academics, policymakers, and regulators.

## References

- [1] Roh, T.H.: 'The sharing economy: Business cases of social enterprises using collaborative networks', *Procedia Computer Science*, 2016, 91, pp. 502-511 <https://doi.org/10.1016/j.procs.2016.07.129>
- [2] Xu, X., Zeng, S., and He, Y.: 'The impact of information disclosure on consumer purchase behavior on sharing economy platform Airbnb', *International Journal of Production Economics*, 2021, 231, pp. 107846. <https://doi.org/10.1016/j.ijpe.2020.107846>
- [3] OECD: 'Intellectual Assets and Value Creation: Synthesis Report', OECD Paris, 2008.
- [4] Zhou, Y., and Yin, W.: 'New Improvement of Labor Accounting in the Sharing Economy', *Advances in Mathematical Physics*, 2020, Vol.2020, pp.1-8. <https://doi.org/10.1155/2020/7958951>
- [5] Garud, R., Kumaraswamy, A., Roberts, A., and Xu, L.: 'Liminal movement by digital platform-based sharing economy ventures: The case of Uber Technologies', *Strategic Management Journal*, 2022, 43, (3), pp. 447-475. <https://doi.org/10.1002/smj.3148>
- [6] Kogut, O.Y., Janshanlo, R.E., and Czerewacz-Filipowicz, K.: 'Human capital accounting issues in the digital economy', Springer, 2020, pp. 296-305. [https://doi.org/10.1007/978-3-030-11367-4\\_29](https://doi.org/10.1007/978-3-030-11367-4_29)
- [7] Nancy, F., Sulistiawan, D., and Rudiawarni, F.A.: 'Revisiting the Role of Intellectual Capital on Firms' Performance: Indonesian Evidence', Atlantis Press, 2020, pp. 350-355. <https://doi.org/10.2991/aebmr.k.200127.072>
- [8] Martín-de Castro, G., Díez-Vial, I., and Delgado-Verde, M.: 'Intellectual capital and the firm: evolution and research trends', *Journal of Intellectual Capital*, 2019, 20, (4), pp. 555-580. <https://doi.org/10.1108/JIC-12-2018-0221>
- [9] Cordazzo, M., and Rossi, P.: 'The influence of IFRS mandatory adoption on value relevance of intangible assets in Italy', *Journal of Applied Accounting Research*, 2020, 21, (3), pp. 415-436. <https://doi.org/10.1108/JAAR-05-2018-0069>
- [10] Andrikopoulos, A.: 'Accounting for intellectual capital: on the elusive path from theory to practice', *Knowledge Process Management*, 2010, 17, (4), pp. 180-187. <https://doi.org/10.1002/kpm.355>
- [11] Sadq, Z.M., Ahmad, B.S., Saeed, V., Othman, B., and Mohammed, H.: 'The relationship between intellectual capital and organizational trust and its impact on achieving the requirements of entrepreneurship strategy (The case of Korek Telecom Company, Iraq)', *International Journal of Advanced Science Technology*, 2020, 29, (2), pp. 2639-2653.
- [12] Nuryaman, N.: 'The influence of intellectual capital on the firm's value with the financial performance as intervening variable', *Procedia-Social and Behavioral Sciences*, 2015, 211, pp. 292-298.
- [13] Parente, R.C., Geleilate, J.-M.G., and Rong, K.: 'The sharing economy globalization phenomenon: A research agenda', *Journal of International Management*, 2018, 24, (1), pp. 52-64. <https://doi.org/10.1016/j.intman.2017.10.001>
- [14] Weqar, F., and Haque, S.I.: 'Intellectual capital and corporate financial performance in India's central public sector enterprises', *International Journal of Learning Intellectual Capital*, 2020, 17, (1), pp. 77-97. <https://doi.org/10.1504/IJLIC.2020.105323>
- [15] Harris, L.: 'A theory of intellectual capital', *Advances in Developing Human Resources*, 2000, 2, (1), pp. 22-37. <https://doi.org/10.1177/152342230000200104>
- [16] Gogan, L.-M., and Draghici, A.: 'A model to evaluate the intellectual capital', *Procedia Technology*, 2013, 9, pp. 867-875. <https://doi.org/10.1016/j.protcy.2013.12.096>
- [17] Sardo, F., Serrasqueiro, Z., and Alves, H.: 'On the relationship between intellectual capital and financial performance: A panel data analysis on SME hotels', *International Journal of Hospitality Management*, 2018, 75, pp. 67-74. <https://doi.org/10.1016/j.ijhm.2018.03.001>
- [18] Leoni, G., and Parker, L.D.: 'Governance and control of sharing economy platforms: Hosting on Airbnb', *The British Accounting Review*, 2019, 51, (6), pp. 100814. <https://doi.org/10.1016/j.bar.2018.12.001>
- [19] Nielsen, C., Roslender, R., and Schaper, S.: 'Continuities in the use of the intellectual capital statement approach: Elements of an institutional theory analysis', Elsevier, 2016, pp. 16-28.

<https://doi.org/10.1016/j.accfor.2015.11.002>

- [20] Demartini, P., and Paoloni, P.: 'Implementing an intellectual capital framework in practice', *Journal of Intellectual Capital*, 2013, 14, (1), pp. 69-83. <https://doi.org/10.1108/14691931311289020>
- [21] Yu, A., Garcia-Lorenzo, L., and Kourti, I.: 'The role of Intellectual Capital Reporting (ICR) in organisational transformation: A discursive practice perspective', *Critical Perspectives on Accounting*, 2017, 45, pp. 48-62. <https://doi.org/10.1016/j.cpa.2017.01.003>
- [22] Nicolo', G., Manes-Rossi, F., Christiaens, J., and Aversano, N.: 'Accountability through intellectual capital disclosure in Italian Universities', *Journal of Management Governance*, 2020, 24, pp. 1055-1087. <https://doi.org/10.1007/s10997-019-09497-7>
- [23] Buletova, N., and Stepanova, E.: 'Digital sharing economy as a tool of sustainable development: Evolutionary vector and structural changes', Springer, 2020, pp. 975-986. [https://doi.org/10.1007/978-981-15-2244-4\\_93](https://doi.org/10.1007/978-981-15-2244-4_93)
- [24] Vith, S., Oberg, A., Höllerer, M.A., and Meyer, R.E.: 'Envisioning the 'sharing city': Governance strategies for the sharing economy', *Journal of Business Ethics*, 2019, 159, (4), pp. 1023-1046. <https://doi.org/10.1007/s10551-019-04242-4>
- [25] Meng, T., Ng, E., and Tan, B.: 'Digital attrition: The negative implications of the sharing economy for the digital options of incumbent firms', *Information Systems Journal*, 2022, 32, (5), pp. 1005-1033. <https://doi.org/10.1111/isj.12380>
- [26] Chen, G., Cheng, M., Edwards, D., and Xu, L.: 'COVID-19 pandemic exposes the vulnerability of the sharing economy: a novel accounting framework', *Journal of Sustainable Tourism*, 2022, 30, (5), pp. 1141-1158. <https://doi.org/10.1080/09669582.2020.1868484>
- [27] Cui, L., Hou, Y., Liu, Y., and Zhang, L.J.I.T.f.D.: 'Text mining to explore the influencing factors of sharing economy driven digital platforms to promote social and economic development', 2021, 27, (4), pp. 779-801. <https://doi.org/10.1080/02681102.2020.1815636>
- [28] Grossi, G., Biancone, P.P., Secinaro, S., and Brescia, V.: 'Dialogic accounting through popular reporting and digital platforms', *Meditari Accountancy Research*, 2021, 29, (7), pp. 75-93. <https://doi.org/10.1108/MEDAR-01-2021-1163>
- [29] Moltene, L., and Orsato, R.J.: 'The sharing economy in practice: An exploratory study of the acceptance and use of digital platforms in food waste reduction', *Revista de Administração de Empresas*, 2021, 61. <https://doi.org/10.1590/S0034-759020210508x>
- [30] Sveiby, K.-E., and Lloyd, T.: 'Methods for measuring intangible assets', 2010.
- [31] Nazari, J.A., and Herremans, I.M.: 'Extended VAIC model: measuring intellectual capital components', *Journal of intellectual capital*, 2007, 8, (4), pp. 595-609. <https://doi.org/10.1108/14691930710830774>
- [32] Pedro, E.d.M., Leitão, J., and Alves, H.: 'Bridging intellectual capital, sustainable development and quality of life in higher education institutions', *Sustainability*, 2020, 12, (2), pp. 479. <https://doi.org/10.3390/su12020479>
- [33] Vessonen, E.: 'The complementarity of psychometrics and the representational theory of measurement', *The British Journal for the Philosophy of Science*, 2020.
- [34] Pike, S., and Roos, G.: 'Mathematics and modern business management', *Journal of Intellectual Capital*, 2004, 5, (2), pp. 243-256.
- [35] Raut, U.R., Brito, P.Q., and Pawar, P.A.: 'Analysis of brand resonance measures to access, dimensionality, reliability and validity', *Global Business Review*, 2020, 21, (1), pp. 162-175. <https://doi.org/10.1177/0972150919846964>