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## Business Innovation based on artificial intelligence and Blockchain technology

Zeyu Wang<sup>a</sup>, Mingyu Li<sup>a</sup>, Jia Lu<sup>b</sup>, Xin Cheng<sup>c,\*</sup>

<sup>a</sup> Institute of Quality Development Strategy, Macro-quality Management Collaborative Innovation Center in Hubei Province, Wuhan University, Wuhan City 430072, China

<sup>b</sup> Department of Social Science, University of California, Irvine, 3151 Social Science Plaza, Irvine, CA 92617, USA

<sup>c</sup> School of Public Administration, Zhongnan University of Economic and Law, 182 Nanhu Road, Wuhan City, 430070, China

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### ABSTRACT

The growing business evolution and the latest Artificial Intelligence (AI) make the different business practices to be enhanced by the ability to create new means of collaboration. Such growing technology helps to deliver brand services and even some new kinds of corporate interactions with customers and staff. AI digitization simultaneously emphasized businesses to focus on the existing strategies and regularly and early pursue new market opportunities. While digital technology research in the framework of business innovation is gaining greater interest and the privacy of data can be maintained by Blockchain technology. Therefore in this paper, Business Innovation based on artificial intelligence and Blockchain technology (BI-AIBT) has been proposed to enhance the business practices and maintain the secured interaction among the various clients. The collection of qualitative empirical data is made up of few primary respondents from two distinct business sectors. BI-AIBT has been evaluated by undertaking and exploring the difference and similarities between digitalization's impact on value development, proposal, and business capture. Besides, organizational capacities and staff skills interaction issues can be improved by BT. The experimental result suggests that digital transformation is usually regarded as essential and improves business innovation strategies. The numerical result proposed BI-AIBT improves the demand prediction ratio (97.1%), product quality ratio (98.3%), Business development ratio (98.9%), customer behavior analysis ratio (96.3%), and customer satisfaction ratio (97.2%).

### 1. Overview business innovation based on artificial intelligence and blockchain technology

Business innovation is when an organization incorporates new procedures, services, or goods that influence positive business changes (Morkunas, Paschen & Boon, 2019). The point at which an association presents recent cycles, administrations else items towards stimulus positive modification in their business is termed as business innovation. It can integrate working on existing methodologies else practices, otherwise beginning in the absence of any preparation. AI alludes to machines that are worked to perform wise errands that have generally been refined through people. Blockchain is a decentralized organization of PCs that records as well as stores information to show a sequential series of occasions on a straightforward in addition to unchanging record framework.

\* Corresponding author.

E-mail address: [Z0005032@zuel.edu.cn](mailto:Z0005032@zuel.edu.cn) (X. Cheng).

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This innovation can mean improving or beginning from scratch current procedures or processes (Hu et al., 2018). Today, technologies from Blockchain and artificial intelligence (AI) can transform current processes, develop innovative business models and change whole industries (Nguyen, Liu, Chu & Weng, 2018). For example, by supplying a shared and decentralized distributed directory, Blockchain can improve confidence, accountability, protection, and privacy in business units (J. Gao, Wang & Shen, 2020; Sun, Yan & Zhang, 2016). A blockchain can hold all sorts of properties is similar to the register or a commonly distributed ledger (Pham, Nguyen, Nguyen, Pham & Nguyen, 2020). A data set that is consensually shared and synchronized across different destinations, establishments, else topographies, open through numerous individuals is termed as distributed ledger. Basic appropriated records are the very innovation that is utilized via blockchain, which is the innovation that is utilized through bitcoin. A sort of DLT wherever exchanges are recorded with a permanent cryptographic mark named a hash is alluded as blockchain. The exchanges are then assembled in blocks in addition every recent square incorporates a hash of the past one, binding them together, thus why conveyed records are frequently referred as blockchains. These details can primarily be correlated with money and identities (Andoni et al., 2019). In the German and European sectors, the IoT moves to optimize the sectors and facilitate business processes (Asgar et al., 2021; Ruan et al., 2019). Finally, AI enhances operations by identifying and maximizing business process outcomes (Manogaran, Alazab, Shakeel & Hsu, 2021). The innovation process aims to generate profit for the company (Jan et al., 2020). That benefit comes from creating new sales opportunities or driving more income on existing platforms, saving time, resources, or efficiency or performance improvements (Kumar et al., 2020).

Blockchain innovation is a transformative innovation that destroys competence because the technological innovation would obsolete the existing one (Arjun & Suprabha, 2020; J. Gao, Wang & Shen, 2020). Its market-wide application would reorganize business structures for every sector, a disruptively architectural innovation (Fu et al., 2020). Blockchain allows decentralized marketplaces and collaboration platforms, including computational power data and algorithms, to be used for several artificial intelligence elements (G. Manogaran et al., 2020; P et al., 2020). It can promote a wider range of other developments and the use of AI (Filimonau & Naumova, 2020; Wang, Huang, Hsu & Yang, 2016). Artificial intelligence means machinery which has historically been designed to execute intellectual tasks (Khelifi et al., 2020). Blockchain is a decentralized computer network that records and stores data in a transparent and immutable ledger system, displaying an event sequence (Amin, Faragallah & El-Latif, 2010; Kaur, Garg, Kaddoum, Ahmed & Atiqzaman, 2019). Blockchain and AI's integration can improve machine learning and make financial products available to AI (Feng, He, Zeadally, Khan & Kumar, 2019; Ur-Rehman, Gondal, Kamruzzaman & Jolfaei, 2020). Blockchain allows for secure storage and data sharing or other benefits (Mistry, Tanwar, Tyagi & Kumar, 2020). Blockchain advances can possibly fundamentally modify fabricating supply chains, as well as with them, cut out the agent, smooth out measures, then develop security overall just as work on information the board. By streamlining and automating regular procedures and tasks, artificial intelligence has the potential to save time & expense in the workplace. It boosts productivity and overall efficiency, allowing for quicker management decisions based on the cognitive technology outcomes. Artificial intelligence enables businesses to give their clients a more customized experience. AI is far more effective at analysing big data. It can swiftly spot patterns in the data, such as previous past purchases, tastes, credit ratings, as well as other similar threads.

The problem undertaken is to provide high level of promotion and marketing towards branding in the concept of digitalization towards the artificial intelligence. AI is frequently utilised in marketing campaigns where quickness is critical. AI systems know how to better engage with customers based on information and client data, then give them customized communications at the ideal moment without any need for advertising staff involvement, ensuring optimal productivity. Artificial intelligence allows firms to better control their internet brand and secure existing presence online. It accomplishes this by allowing brand and service executives to undertake comprehensive review and study on webpages, social networking sites, and other venues.

Blockchain technology has the ability to profoundly alter the way businesses are run, as well as the social and economic institutions on which they are built. It will be investigated how block chain can be used to validate the properties of a transaction at a low cost under particular scenarios. The blockchain enables secure authentication mechanism. Your clients and workers both have electronic IDs that make it simple to confirm their identities. Identity fraud, financial fraud, theft, and other cybercrime risks are reduced when this data is maintained on a public blockchain. Business innovation based on artificial intelligence and Blockchain technology (BI-AIBT) has been proposed to increase business processes and ensure a safe interface with different customers. There are few key respondents from two separate business sectors in the compilation of qualitative analytical evidence. The company has assessed BI-AIBT, and the differences and similarities among the effects of digitalization on value creation, proposal, and business capture have been explored. Furthermore, BT can enhance the interaction between organizational capabilities and skills.

The main contribution of this paper is,

- Design Business innovation based on artificial intelligence and Blockchain technology (BI-AIBT) is used for business developments
- Determine the Blockchain technology uses to apply security layers to the network's storage data
- The numerical outcomes suggested the BI-AIBT enhance demand prediction ratio, product quality ratio, Business development ratio, customer behavior analysis ratio, and customer satisfaction ratio compared to an existing model

The remainder of this paper can be arranged accordingly. In section 2 describe the related study on Business innovation. In section 3 summarize the proposed study that has been utilized in this paper. The simulation outcomes and discussion are described in section 4. Lastly, section 5 accomplishes this paper with a detailed discussion of the observation and outcomes.

## 2. Related works of business innovation

The Business innovation is shown through a detailed literature review localization processes for studies analyzed by peers.

Stratan et al. (Stratan, Novac & Vinogradova, 2020) suggested sustainable productivity growth in small and medium enterprises (SMEs) can be achieved in the contemporary economy if advances are implemented in businesses. Various approaches, including collaboration with other firms and academics, can further increase the creative ability of companies. Moreover, most Moldovan SMEs do not know that inventions based on scientific findings must be implemented or researchers - that their studies must be marketed.

Thuethongchai et al. (Belazi, Khan, El-Latif & Belghith, 2016) recommended Big-data analytics (BDA) receive considerable exposure because it could contribute to the corporate planning process and provides useful insight to design and improve service creativity. They studied the use of large-scale service innovation analytics. The emphasis used analytical data features to collect genuine consumer needs through the digital service channel from contact data.

Trad et al. (Thuethongchai, Taiphapoon, Chandrachai & Triukose, 2020; Trad, 2021) modeled an applied holistic mathematical model (AHMM) used to research Transformations of businesses, applied mathematics, business engineering, financial science, and the global infrastructure of the business. The proposed formality of AHMM imitated certain human cognitive processes, including the decision-making system for heuristic use, which relied largely on a beam scrutiny technique. The special feature is that the AHMM promoted a comprehensive separation process, coordination of different EA concepts, and transition methods supporting corporate transformation initiatives.

Hakala et al. (Nguyen, Leu, Zeadally, Liu & Chu, 2018) suggested the model-narrative review (MNR) method could connect important work on the market, entrepreneurial, and innovation environments to interpret this evolving narrative. They exposed a host of implicit interpretations and fundamental expectations, bring transparency and intellectual clarity to ecosystem rhetoric. In all, MNR synthesizes and strategically reflected upon the similarities and variations between related ideas, creating a system for creating model narratives that open space for alternate research questionnaires.

Borah et al. (Hakala, O'Shea, Farny & Luoto, 2020) recommended improvised marketing interventions (IMI) – social media activities are written and carried out in real-time near an actual incident. The proof of five multi-method analyses, including quasi tests, and analytical data, were archived, and the theory that the impact of the IMI was supported by laughter and unanticipated. The results highlighted the promise of IMI for social media and the features that businesses need to reap the online networking observed proactively, and the value gains they had to gain.

Mustafa et al., (Mustafa & Khan, 2020) identifies and underscores the potential and difficulties that Islamic Banking System can acquire from traditional FinTech firms. As during course of this investigation, it was discovered that Islamic FinTech businesses are more likely to be viewed collaborators by Islamic Banking Institutions than rivals.

Zhao et al., (Zhao, Xue, Khan & Khatib, 2021) studies the customer behavior for company's growth, the Adaptive Hybridized Intelligent Computational Models (AHICM) was created. Product innovations, new attitudes, and new mentality for society necessitate a detailed examination of market groups and customer needs.

Manogaran et al., (G. Manogaran et al., 2020) introduces the blockchain-based integrative safety mechanism (BISM), which is designed to provide safe access management and privacy protection for commodities and individuals. The user access mechanism is based on the statuses of virtual resources at various time intervals, while privacy protection is based on response times durability.

Business Innovation based on artificial intelligence and Blockchain technology (BI-AIBT) has been proposed to improve the business practices to overcome the existing techniques, SMEs, BDA, AHMM, MNR, and IMI. BI-AIBT has recommended improving the demand prediction ratio, product quality ratio, Business development ratio, customer behavior analysis ratio, and customer satisfaction ratio.

### 3. Proposed business innovation based on artificial intelligence and blockchain technology (BI-AIBT)

Blockchain is a data collection protocol that makes changing, hacking, or scamming the system difficult or impossible. A blockchain is a digital ledger directory, duplicated and replicated over the whole computer network on the Blockchain. Blockchain, once in a while indicated to as Distributed Ledger Technology (DLT), creates the historical backdrop of somewhat advanced resource unalterable as well as straightforward utilizing decentralization besides cryptographic hashing. The stated method makes a decentralized appropriation chain that gives everybody admittance towards the record concurrently. More cases of non-financial usage for blockchain technologies, including supply chain management and digital identity, are emerging in recent years. The raises benefits, lifts collaboration, reducing costs, efficiencies, are made by using supply chain management. It engages associations to all the more promptly supervise demand, pass on the ideal proportion of stock, oversee interferences minimize costs in addition to fulfill client requirement in the best manner conceivable. Blockchain can engage clients to have more noteworthy power over their own character. Associations can utilize the data just with clients' assent besides no focal element would have the option to think twice about buyer's personality. The most recent research highlights the value of integrating Blockchain technology with other technology, such as IoT and AI, for example, using blockchain technology to enhance the system architecture of many IoT devices. Computerized reasoning enabled IoT makes sharp machines that replicate savvy lead just as supports in powerful with for all intents and purposes no human impedance. While IoT oversees contraptions conveying using the web, AI makes the devices acquire from their data just as experience. IoT enables contraptions across the Internet to send data to private blockchain associations towards make modify safe records of shared trades. IBM Blockchain engages your associates to share just as access IoT data with you — yet without prerequisite for central control other than the leaders. The interactions between these three technologies are mostly ignored and used mostly separately in Blockchain, IoT, and AI. These technologies can and should be jointly developed and brought together in the development. One possible connection can be that IoT collects and supplies data, while AI optimizes processes and regulations through Blockchain, providing infrastructure and establishing rules for engagement (Borah, Banerjee, Lin, Jain & Eisingerich, 2020).

Fig. 1 shows business innovation based on artificial intelligence and blockchain technology. In a business process, Blockchain can

handle industrial transactions between resource requirements and resource suppliers. The project supervisor to build up the assets expected to execute the work on the task is characterized by resource requirements. The basic advantage of strong, sound supplier associations is that you can procure better motivator for your business. The better you know your suppliers, notwithstanding the better they know you, the more plausible you are to benefit with fanatic commitment, specific assessing just as remarkable terms. Blockchain’s key function in this paradigm is to store new supply chain transactions between the demands of many customers and many suppliers. Customers can generate new demand via the decentralized order engine, and manufacturers can provide new goods through the decentralized product engine as a new transaction (G. Manogaran et al., 2020). Regardless of whether a blockchain is brought together else decentralized basically alludes to the privileges of members on the record, besides is subsequently an issue of plan. In a decentralized organization, anybody can take an interest as well as execute on the record. In a brought together organization, just known as well as recognized gatherings can execute on the record. The smart contract mechanism acts as an authenticating protocol between the two engines to check and safeguard the data patterns for transactions between suppliers and customers. The expected level of security could not always be provided by commercial off-shelf technology. A term for programming items that are instant in addition to accessible for buy in the business market is alluded as commercial-off-the-rack (COTS). Public area associations are depending increasingly more on COTS applications to enhance, supplant restrictive frameworks else improvement. An alternative is a mission model of protection that can be modified according to customized requirements. It shows a further layer of custom protection would secure the data in the network of a business. The benefit of this personalized approach is that the employee’s agent (EA) can monitor the key parameters of generation and decide the frequency of public and private key regeneration. One among who is approved to do some represents else for the benefit of the head is said to be as employee’s agent (EA). For instance, you can have a representative that you have approved to make significant buys for the organization – the specified worker would be an approved specialist for that reason despite the fact that no other representative is approved.

ICA – Indirect cost accounting. The ICA offers restricted access to the approved EA to each database cluster. A method for getting advanced information utilizing at least one numerical procedure, alongside a secret key else ‘key’ utilized to decode the data. For instance, sites that communicate Mastercard as well as financial balance numbers ought to consistently encode the stated data towards forestall information fraud besides extortion. The encryption of the data is done before entering the database. Each data cluster is encrypted with a separate key to allow access to the details only by the approved workstation. In receiving state, ICA accepts consumer and company data from the internet or extranets through the firewall. The ICA specifies which secret key should be used to encrypt data symmetrically. When the ICA is in this state, symmetric key encryption generates secret keys in the processing state. Using passwords, client and company account information can be stored in a database. The ICA manages the main delivery under the accountability of the staff. EAs can be allocated to account in different ways, including location or account balance (G. Manogaran et al., 2020).

In sending state, the ICA sends the secret keys to the corresponding EAs. The ICA encrypts data obtained from external networks through a secret key. In the clustered database, the ICA writes data. Employees manage their own workstations’ business accounts. The sender encrypts the data with the recipient’s public key to exchange data with other staff, and the recipient decrypts them using the private key associated with the data. This enhanced authentication layer defends data from internally unauthorised uses (Nguyen, Leu & Liu, 2017).

Fig. 2 shows the impact on the marketing of Blockchain. It is focused on communication between peers, changing market dynamics, including the elimination of intermediaries that control and filter data sources and increase costs. This intermediation promotes intermediaries. Technology from Blockchain can improve data quality by creating immutable and popular data archives and facilitate access to data. Numerous parts of an association’s capacity to work are termed as information quality. Reports are off base at the time of information isn’t gathered as expected. Conflicting coded values among frameworks forestall genuine comprehension of hazard.

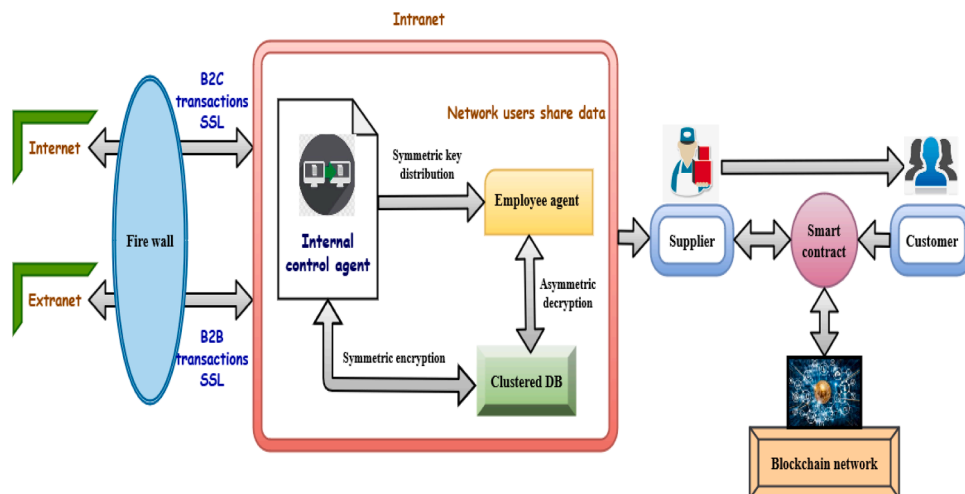


Fig. 1. Business Innovation based on artificial intelligence and Blockchain technology (BI-AIBT).

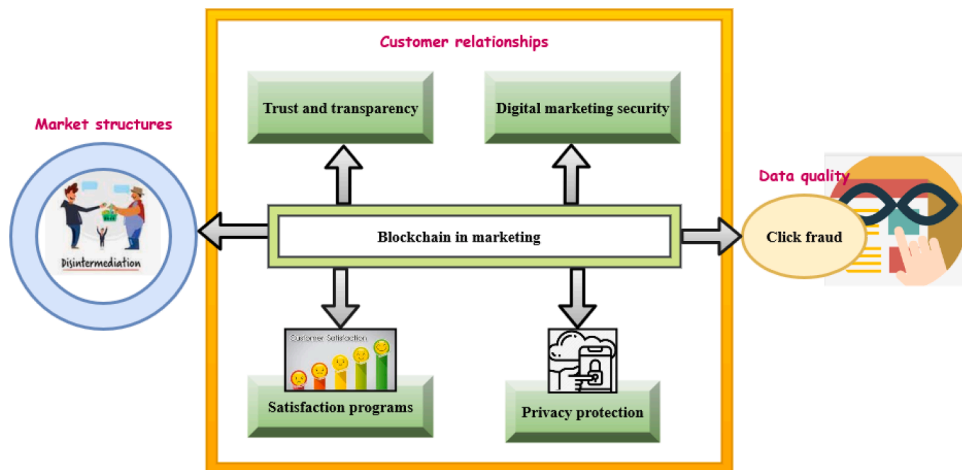


Fig. 2. The impact on the marketing of Blockchain.

Clarvonyt assists with settling these issues as well as enhances any task. Blockchain technologies can alter business experiences radically from a customer-oriented perspective through data and information disclosure and privacy. It forms innovative arrangements for customer satisfaction that can contribute to added value. The internet has evolved, and the delivery of products and services of companies has changed radically. New technology modified traditional trading strategies, diminished dependency on traditional intermediaries, and launched new intermediary electronics. At the same time, the internet has helped to provide new online intermediaries with new products and services (Sheron, Sridhar, Baskar & Shakeel, 2019).

In contrast, the growth of social media highlighted the increasing need for businesses across social networks to attract consumers. The internet has become a distribution channel, allowing advertisers to sell web services and their products to create contacts with their customers. The internet is an effective networking medium that enables companies to communicate directly and remind customers about their new goods, services, and business innovations. While there are no disputes over the value of an online presence, a string of frauds, controversies, and disappointing promotions have plagued the credibility of the marketing and advertisement business. This phenomenon is responsible for the automated design of web advertisements and increasing target marketing demands. The section of buyers probably going to need else require a business' items else administrations. The stated gathering of individuals is a subset of the business' complete market. For instance, a kids' toy might have young men ages 9–11 as the objective market then the young men's folks as the intended interest group. Any type of Internet-based advertising is said to be as web advertising. At the point we say any structure, we mean whenever your organization takes an interest on the web. Since recollect, promoting doesn't simply happen subsequently you're paying for it or effectively seeking after it. The specified implies web promoting incorporates: email crusades, web-based media action, your site, as well as your blog. Click fraud is intentional to using programmed codes or computer programs by a true individual or business. The use of natural individuals to imitate legitimate web-users in clicking on online advertisements attempts to gain illegitimate interests or empty the supplier's annual budget. The unlawful act of caricaturing pay-per-click (PPC) commercials to build site income else to drain an organization's promoting spending plan is said to be as click fraud. It can be at times to be completely through a site's own proprietors to falsely support its advertisement income. Block chain can help in fraud location through empowering the sharing of data progressively as well as refreshing the record upon the arrangement, everything being equal. The specified state won't just forestall fakes yet in addition bring down the general expenses besides time taken for the cycle as well.

The framework can reduce certain risks associated with catastrophic click fraud by offering a securer digital marketing network for consumers and brands. The insurance of one's advanced character is termed as digital security as it addresses the actual personality on the organization you are working on else the network access being used. It incorporates the devices which one uses to get his/her personality, resource as well as innovation in the online besides versatile world. The capacity of computerized showcasing is to help you aggregate ongoing traffic, leads just as arrangements for your business through reaching people looking for your things other than organizations. Without assistance from any other person, web publicizing is the way toward exhibiting your association online to approaching leads other than high-regard purchasers. The quality of a brand depends on whether it is trustworthy and transparent. Blockchain technology can allow marketers and customers to operate in a secure and transparent ecosystem to promote trust and transparency in digital marketing. To lay it out plainly, a blockchain is advanced record that exchanges, else whatever otherwise besides, for all time. Trust as well as transparency are all around adjusted towards the capacity of a record of passages that can't be deleted else modified. In addition to it permits individuals to look as well as see the exchanges that occurred.

BT-enabled transparency enhances trust as customers become more visible and verifiable about brand statements' enforcement requirements. This transparency can include verification of certificates, such as organic and other certificates by third parties, business practices of the company, and even incorporating social liability. Brands can demonstrate several inspirational characters and ensure that they remain transparent and stress their altruistic motivation to pursue customers' best interests.

Privacy is a dynamic issue that could intensify customers' issues over the use of online technology resources. Research has



demonstrated that clients are anonymous and discreet with their transactions. The increasing risk of illegally accessing, misuse is responsible for these concerns. A far-reaching hazard the board framework for a blockchain network, utilizing online protection structures, affirmation administrations in addition to best practices to diminish chances against assaults besides misrepresentation is termed as blockchain security. Privacy problems have escalated after website cookies collect and preserve personal details in data structures. In combination with modern data mining techniques, extensive improvements in data collection technology enable marketers to classify, map, recapture and process customer information quickly. This improvement raises new issues with online shoppers' privacy. Brands have to build a stable technological infrastructure that fixes qualitative analysis and increases customer interest in the digital marketing environment before integrating identity security into the marketing narrative. The micro as well as macro scale climate is the two sections which comprised in digital marketing environment. Working climate is referred as micro-environment then the remote environment is referred as macro environment. It influences individuals' associations, work, buys, and propensities. It significantly affects the customary methods of promoting and ought to have a solid handle on the usage of the advanced universe which will expand a brand's effect as well as its image mindfulness. This stable technological infrastructure means that brands and customers profit from blockchain technology that guarantees an amount of protection that is unmatched. From a consumer-centric perspective, blockchain methodology can possibly considerably change customer connections through upgrading information in addition to data straightforwardness, then developing protection as well as security. It likewise considers inventive types of buyer reliability programs which may assist with making extra worth. Blockchain Security is strongly influenced by its distributed and decentralized data storage. Unified information bases likewise have a precise degree of limits, for instance, persons portrayed beneath: Its sets are profoundly focus to arrange organization. The slower the web association is, the more extended the data set admittance time essential will be. Blockages can occur because of high traffic. The use of various safety protocols, including asymmetric encryption, digital signatures, and access management, ensures quality control, delivery, and retrieval of many customers. An illustration of one kind is said to be as asymmetric encryption. It is otherwise called as Public-Key Cryptography. In contrast to ordinary (symmetric) encryption, it encodes as well as decodes the information utilizing 2 isolated at this point numerically associated cryptographic keys. Computerized marks be similar to electronic "fingerprints." In the type of a coded message, the advanced mark safely attaches an underwriter along with a report in a recorded exchange. They are a particular mark innovation execution of electronic mark (eSignature). A framework used to deal with the entrance of assets through representatives, accomplices, workers for hire besides clients is termed as access management. Regardless of whether this is done physically, coded into applications, else mechanized in a venture stage, access the board is progressively imperative to security.

The theory analysis scheme is developed by applying artificial intelligence using the computer system auxiliary function. A procedure that is utilized to clarify the activities of an unpredictable framework is termed as functions of theory analysis. The essential thought is that the framework is seen as registering a capacity else all the more by and large, as tackling a data handling issue. The to-be-clarified work is deteriorated into a coordinated arrangement of more straightforward capacities. To provide the preconditions for further work development,  $y$  use a computer-specific code for classifying the theory analysis strategy data. The combination of data from the optimization system in marketing is obtained in Eq. (1),

$$Q(n) = \frac{inv_{me}(y)}{\vartheta^2} \sqrt{\rho_1 y}$$

$$Q(m) = \frac{\rho_1 - inv_{me}(y)}{\vartheta^{0.5}} \sqrt{inv_{me}(y) \rho_1} \tag{1}$$

As shown in Eq. (1),  $Q$  is a branch of the project coefficient theoretical analysis,  $\rho_1$  denotes innovation coefficient for business website optimization,  $inv_{me}$  is an innovative feasibility solution and  $\vartheta$  represents coefficient optimization.

In addition, the coefficient of demand optimization is reflected in its theoretical analyzes of node performance and viability. It includes the model described above, which is intended to optimize the innovative models' operational effectiveness, the security formulation as seen by the inspection procedure. Moreover,  $S$  and  $R$  both represent its theoretical analysis of the node performance and viability,  $b$  reflects the business optimization coefficient. It includes the model described above, which is intended to optimize the innovative models' operational effectiveness, the security formulation as seen by the inspection procedure.

$$S_b A = \frac{R_A b_A}{\left(\frac{R_A}{b_A}\right) + \left(\frac{R_B}{b_B}\right)} \times S_b \tag{2}$$

Finally, the optimum testing method is used until the next node coefficient is optimal, after the accuracy of the solution. The variance coefficient by regulating the value coefficient to optimize the information function is a section of the theoretical analysis of the connectivity. As the highest stress amplitude is the best form, the optimum regulation of the point position is achieved in this form, and the method of theoretical analysis is improved further. Hypothetical study of the filter capital distribution system  $G_t$  is shown in Eq. (3),

$$G_t = \frac{\sum_{m=1}^n y_m + R_m}{\sum R_m^{0.5}} + (A.v_1) \tag{3}$$

As shown in Eq. (3),  $y_m$  acquisition of an optimized proposed technique is an  $R_m$  optimization of the reliability of the model,  $A$  with the reason being that this essay developed a technical process which is a step by step test method  $v_1$  namely that the preceding method does not determine the exactness of future operations.

There are three sorts of blunder: grammar mistakes, legitimate mistakes as well as run-time blunders. For the most part mistakes are arranged into three kinds such as efficient mistakes, arbitrary blunders constantly. Net blunders are brought about accidentally in utilizing instruments or meters, figuring estimation in addition to recording information results. The algorithm error must be reduced to ensure that the results are accurate. This part of the development is initially designed to calculate the respective probability input and obtain an optimal output. The following is the formulation used in the model is shown in Eq. (4),

$$g = \sqrt{-1 + a'} \left( \frac{2 - a}{22^2 - 1} \right) + \sum b_n \tag{4}$$

As shown in Eq. (4), Through the centralized operation  $g$ , the results above afford the origin for the ending step, which leads to  $a'$  the performance of the matting instructions and  $b_n$  the value  $g$  obtained by artificial intelligence. The next kind shows the optimization coefficient on the business platform, representing an optimization strategy for structure, representing the algorithm's innovation development value, representing the electric quotient model label, and representing a coefficient for innovation models.  $\beta_{mx}$  represents the electric quotient model label

Fig. 3 shows the design for collaboration on marketing strategies. These collaborative and multi-faceted discussions from brand to the client, from customer to consumer are part of the development of the framework. Social media is a platform for both customer and brand advertisements. More precisely, the contact circuit is assimilated as a main component. A brand can communicate with its customers online or digitally through traditional media and multiple channels through social media exchanges and customer interactions. The company uses its website as a social media hub or connects consumers with third parties' social media platforms (SMPs), such as Facebook and Twitter. The development of brand equity is considered a key component of branding. The general meaning of the word "brand equity" corresponds to the expression "money provided by the brand for the product." Brand Loyalty identifies consumer features that are strongly attached to a brand when a brand is more successful than others and often used. The positive affiliation purchasers to join towards a specific item else brand is said to be as brand loyalty. Clients who show brand unwaveringness are assumed to an product else administration, which is exhibited through their recurrent buys in spite of contenders' endeavors to draw them away. It is a significant part of showcasing as it assists organizations with building a solid brand as well as get the clients once more. It isn't just rebuying the items yet making a positive brand picture brand loyalty in the customer's brain, who turns into a positive brand advocate. Brand loyalty comprises the comparison of products with other brands which provide the same benefits. Brand loyalty is one of the components of brand equity that explains a brand value in which brand trust measurements are made, thus ensuring future cash flows.

Customers can personally enter Facebook's website, browse brand profiles for Facebook, follow the brand name, access the social network details of a friend, or share information with friends. Customers are looking for new business updates and discounts on the Facebook website. These data could be shared with consumers in the network. The brand association positively affects brand equity; customer contact or experience can build, modify or improve beneficial or unfavorable relationships to be influenced differently, strongly, and favorably. Brand associations are called "brand-related items," such as tribute products, brand names, etc. It develops and classifies these connections in three key categories under the brand name: abilities, advantages, and behaviors. Brand confidence in market risk is the confidence in the brand's stability and strength. Confidence is the basis for the long-term development of a business and relationship. The concept of trust has been described as a generic hope that one person could depend on the word. Brand trust is the customer's general propensity to depend on its ability to play its particular role.

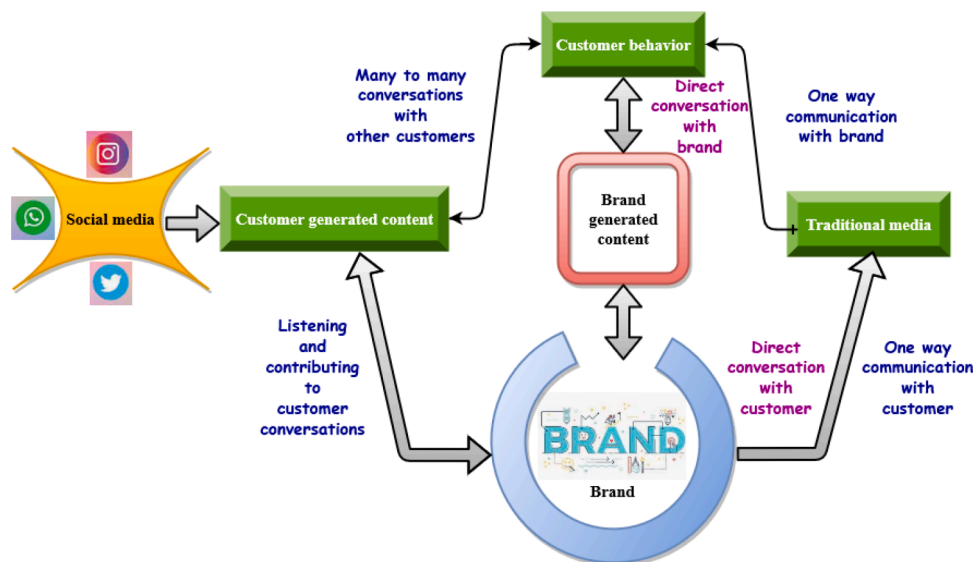


Fig. 3. Design for collaboration on marketing strategies.

The perceived consistency is related to respect for the general superiority of a product or brand. Strong perceived consistency promotes consumers to be convinced that the brand is being bought, differentiates the brand from the market, charges the firm a premium price, and extends the business. The quality shown in the customer-based brand equity environment is considered a key aspect. It has a competitive effect on brand equity and decreases risk, which is the principal element for perceived consistency.

Assume the predictive principles of customer behavior are determined. If the average S-rate of the Web in the whole website is very high or very low, unrealistic outcomes can arise, making it for these consumers that their performance needs to be improved. BI-AIBT uses the device to optimize the real method focused on system forecasts  $X(m)$  and calculations to ensure that the weights of each consumer are equated (5) and (6),

$$X(m) = P^{(m)} + (z^{(n)} - x^T h^{(m)}) \cdot Int_n(a) S_n(a) \tag{5}$$

Now, the value of  $P^{(m)}$  is shown in Eq. (6),

$$P^{(m)} = \exp\left(-\frac{(H^{(n)} - h)^2}{2n^2}\right) \tag{6}$$

Where  $x = (X^T P H)^{-1} h^T P M$

As shown in Eq. (5), the weight of the error rate which follows in the output of the entire business is  $P^{(m)}$ . Eq. (6) is the  $z^{(n)}$  exponential decay function that can adjust  $n^2$  to find the PM value. Finally, the matrix can be used to find the web coefficients for the client, and  $Int_n(a)$  is a single prediction model that can be generated.  $x^T$  marks online purchasing choices,  $h^{(m)}$  shows social media promotion,  $S_n(a)$  is a quicker distribution of products to the consumer.

Fig. 4 shows the data sharing architecture of user-controlled data protection. The general process provides that current customer

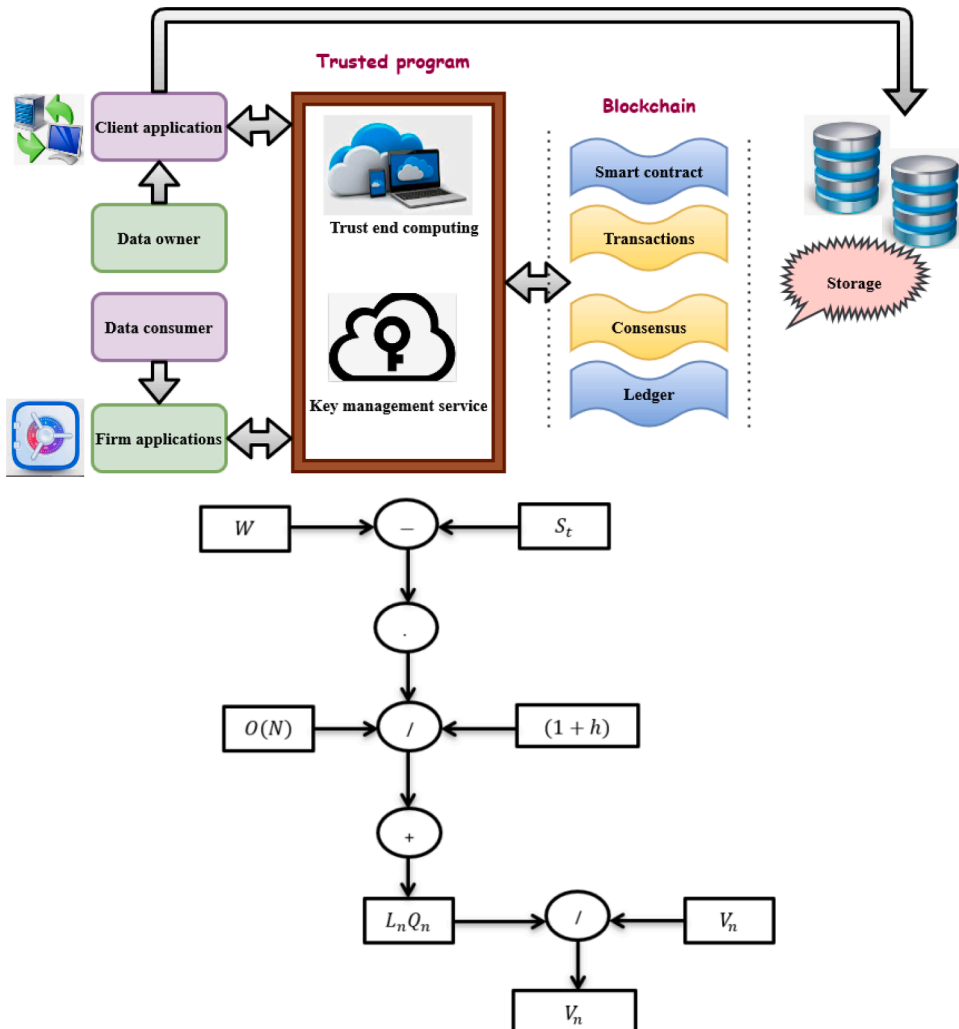


Fig. 4. Data sharing architecture of user-controlled data protection, (a): Non-constant holding rate.



information is never Blockchain revealed. The customer data is first hacked and encrypted in off-chain storage until it is uploaded. Data owners can store data from the client applications directly in off-chain storage. The requirements for access to Customer Data in smart contracts are encoded and published along with database and hash information on the blockchain network. The hashes of the Blockchain information prohibit data from being manipulated by the central commodity. The fundamental thought behind content-based addressing is to address content as opposed to tending to has, in this way isolating substance from its area. In this methodology content is tended to utilizing names, regularly comprising of a supplier name, content name, as well as form. The content-based addressing is used as a recovery identifier for data hashes. Only productive contract invocations result in the release of the user information decryption key, while smart agreements are invoked by the data used for user information access. The trustworthy program derives the hash from the Blockchain and collects data from off-chain storage using this hash, decrypts it, and transmits it to the username, thereby addressing the data owner’s incentives. Blockchain and smart contracts provide customers with full information about who is accessing and through whom their data is accessible. A variety of data-sharing uses and data types can be identified by users who can be shared.

The architecture demonstrates that customer data collection is central storage that a reliable company can manage. Suppose trust exists in both the data storage and management of a centralized service provider. The records on a blockchain are gotten through cryptography. Organization members have their own private keys that are doled out towards the exchanges they create besides go about as an individual computerized signature. SHA-256 hashing calculation is mostly utilized by blockchains as their has work. Cryptographic hash capacities give the accompanying advantages towards the blockchain: Avalanche impact as a minor modification in the information can bring about a fundamentally unique yield. In that case, it is difficult to alleviate the various risks of manipulation, hacking, or selling information to other entities without customer permission. If the organization defaults, the risk can be lost. The small number of people in the multichain system effectively implements the off-chain Blockchain of consumer data storage. Any data collected that saves storage space and bandwidth are optionally saved for users off-chain. BI-AIBT proposed similar ideas for the retailer and access to off-chain data through MultiChain. Core processes such as hacking and encrypted user data, local (out-of-blockchain) storage of the encrypted information, committing the file hash on Blockchain, looking for necessary data, verifying data, and data supply.

The ledger is a record used to sort the transactions and to summarize them. MultiChain Blockchain is available for sharing customer data between companies on each participating end of the enterprise. This allows the information to be released in tributary and shared with the customers as smart contracts on creative communications. Key management servers that track and secure the whole lifecycle of encrypted keys from theft or misuse. Ultimate supervision of the development, use, recovery, archive, and deletion of encryption key technologies, KMS, and all other key management technology. Consensus decision-making is a creative means of developing a strategy for all employees. By providing feedback and offering proposals, all workers find consensus. The objective of consensus-building is to introduce a solution that benefits all impacted workers.

$$Tra_{cus} = (W - S_t) \cdot \frac{O(N)}{(1+h)} + L_n Q_n / V_n \tag{7}$$

The typical expression for consumer lifetime  $Tra_{cus}$  in a prescribed setting, which represents the non-constant holding rate occurrence, is shown in Eq. (7).

As shown in Eq. (7) and Fig. 4(a) shows non-constant holding rate,  $O(N)$  the survivor function is a valuable term for the delivery of consumer lives,  $L_n$  is customer’s relationship with the company,  $Q_n$  is to forecast future customer behavior and  $V_n$  to integrate service supplier relationships within the CRM perspective  $W - S_t$  indicates precaution is that business inputs and  $(1+h)$  global obtaining from various business areas. The higher market model of growth aims to value a stock that is supposed to increase dividend payment for any future time higher than normal. The dividend is supposed to return to normal with steady growth after this supernormal growth.

Fig. 5 shows the conceptual framework of business. When new technology and advanced Business models (BM) are grown, it ensures that BMs can work anywhere – physically, digitally, or virtually - with anybody, anywhere, and in any Business model ecosystem (BME). A financial neighborhood through a foundation of coordinating relationship just as individuals like the natural substances of the business world. The monetary neighborhood work other than results of critical worth to customers, who are

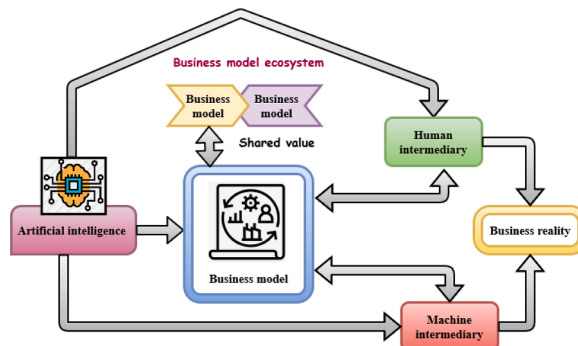


Fig. 5. Conceptual framework.

themselves people from the climate. The part animals in like manner fuse suppliers, competitors, various accomplices then, at that point lead producers. A strategy gives information about an affiliation’s goal market, that market’s need then the work that business things else organizations will play in tending to those necessities. Strategy progression, then, it depicts the communication where an affiliation changes its game plan. Therefore, the BM group needs to change its attitude quickly, and strategic setup as the advanced BMI technology matures. Firms need to develop a setup that allows companies to learn how BM operates and can perform. Businesses ought to know continually how their BM operates and how it can be designed. Businesses would recognize what Business models actually can "do and act" – whether they are built on state-of-the-art technology. In this situation, the latest technology gives us "a helping hand." Artificial intelligence and Virtual reality can allow us to consider operational and innovative companies. And companies must first commit to BM and BMI basic languages — otherwise BMs — and subsequently function and do BMI. Then in innovative materials, it would be very difficult to update, see & realize.

The computational model involves four major parts: intermediary of the human, the intermediary of the machine, the pattern analysis of business model models, and the ecosystem of business models. The four key components are separately identified, along with the archetypes suggested for each element and the case illustration. This conceptual approach is designed to provide a general idea in combination with an understanding and insight into the possibility of digitalizing the business model framework. It is a digital representation of the BM for that purpose; the BM is used. While parts of the conceptual model could be included in non-digital demonstrative BM’s, the theoretical model aims at a digital representative BM’s form. Business Reality is a new and exciting product range. It is a learning simulation based on the board that replicates all the financial flows of money circulating in a company. Shared value is the concept that businesses should build economic value in a process that often supports society by satisfying the demands and challenges of society. This Guidance offers a new approach to mutual value across business models. Intermediaries have combined buyers and sellers of the product, service, and property without taking over. They are not wholesalers or distributors who purchase and only distribute goods. Usually, they are paid for a percentage of the entire transaction. The suggested BI-AIBT method enhances demand prediction ratio, product quality ratio, Business development ratio, customer behavior analysis ratio, and customer satisfaction ratio.

**4. Result and discussion**

The proposed BI-AIBT of the numerical result has been performed. This paper analyzed demand prediction ratio, product quality ratio, Business development ratio, customer behavior analysis ratio, and customer satisfaction ratio.

Fig. 6 shows the demand prediction ratio. Marketing demand predictions are a mechanism from which future product demand can be estimated. The ideal way to predict demand is historical proof. Customers can detect patterns and trends by attacking the command control system or other data sale sources. There could be new goods sold for customers for years. They predict and how they can fluctuate from future earnings. It is critical for companies in the niche to have the correct demand forecast for marketing. Only through accurate research and decision-making can an organization hold the correct stock amounts. It can be discussed later by users. Let us first look in greater depth at the different ways of market prediction. Demand prediction is an observational method used to estimate a product’s demand over time. In simple terms, it allows customers to forecast potential revenue so that they can schedule the inventory, and demand prediction is increasing every year.

Table 1 shows the product quality ratio. The procurement process is followed by various customer conditions for a particular product. Efficiency, consistency of the products, and safety are better than prices in certain businesses. The general characteristic in the company concepts is that the consistency of a commodity or service is consistent with the understanding that it meets consuming demands – the characteristics of a good or service that satisfy specified or implicit needs. A quality product encourages unequivocal

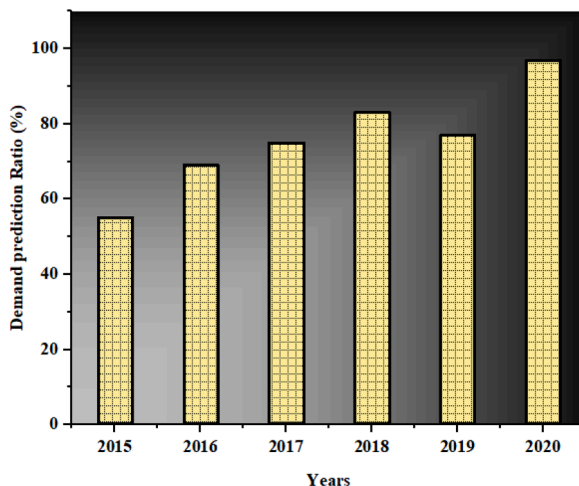


Fig. 6. Demand prediction ratio.

**Table 1**  
Product quality ratio.

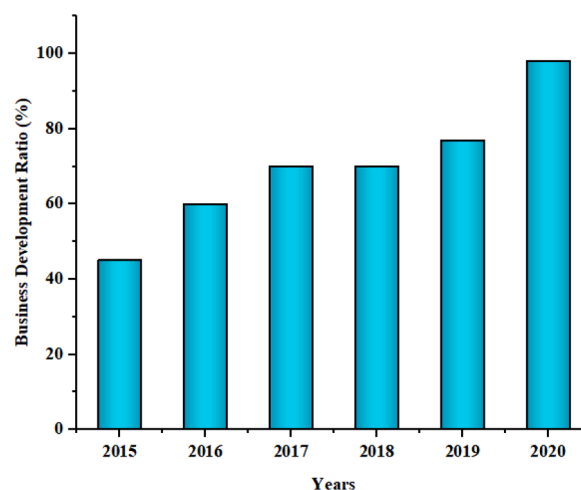
Number of Products	BDA	SMEs	BI-AIBT
10	63	67	79
20	58	72.6	78
30	62	74	82
40	69.1	78	86
50	44	73	80.8
60	67	70	78
70	65	75	87
80	53	71.2	79
90	72.5	76	78
100	55	77	98.3

customer satisfaction and leads extended. If customers deem a commodity of good quality, they buy and advise others repeatedly. The creation of quality products is the most significant consideration for consumers. Product quality in the market is key to customer satisfaction, risk reduction, and the expense of removing faulty goods. When the business makes a bad product, decent consumers can not be able to purchase it. To ensure the continued development and success of electronic trade, determining the commodity quality of products sold over the internet has to be solved.

Fig. 7 shows the Business development ratio using Blockchain. In today's world, Blockchain technology is established to develop businesses. In addition to financial transactions, it is proposed for different business uses. It enhances safety and accelerates knowledge sharing while maintaining accountability. Blockchain technology is reinforcing its presence in the business marketplace to help companies get more clients. Gratefully, the first thing that Blockchain can help with is improved protection. And it is going to take more time for the business community to embrace Blockchain properly. Blockchain technology provides for the company, decreases intermediaries' expense and time, and reinforces the confidence of an actors' ecosystem. An upcoming analysis strip and other companies investigating the use of blockchain technologies are mirrored in the influence of this seminal technology. While the application of these emerging technologies is encouraging, there are still analyses and experiences on improving existing business models and creating new ones.

Table 2 shows the customer behaviors analysis ratio. It including social patterns, the frequency of use, and their impact on their purchasing choices, contribute to the shopping behavior. Companies evaluate customer behavior and develop more sustainable goods and services to learn about population goals. Purchase by consumers refers to the actions taken by customers before buying a product or service (both online and offline). The BI-AIBT approach usually involves search engines, coverage of social media, etc. Companies would consider this strategy, and it allows companies to adapt their marketing strategies more to marketing practices affecting consumers in the past. Consumer behavior analysis evaluates how customers want a product, service, or business to be purchased. When networking develops digitally, customers view different online brands with advertisements. It rapidly suits customers' purchasing habits and is a significant marketing outlet for consumer categories and existing brands. This is the new digital age, which businesses all over the world understand.

Fig. 8 shows the customer satisfaction ratio. Consumers can buy certain items from online stores and purchase them via the internet from businesses that supply their products. Although customer satisfaction does not guarantee a repurchase, customer satisfaction plays a very important role. The most basic purpose of a customer loyalty survey is to provide accurate and consistent customer input to launch campaigns that draw buyers and ensure a market commodity of the highest importance – loyal customers. The consumer is



**Fig. 7.** Business development ratio.

**Table 2**  
Customer behaviors analysis ratio.

Number of Products	BDA	SMEs	BI-AIBT
10	45.8	61	87
20	58	72	72.6
30	57	68.1	80
40	60	72	84
50	51.4	67	89
60	59	62	91
70	55	69	79.5
80	57	72.7	89
90	65	70	81
100	52.7	64	96.3

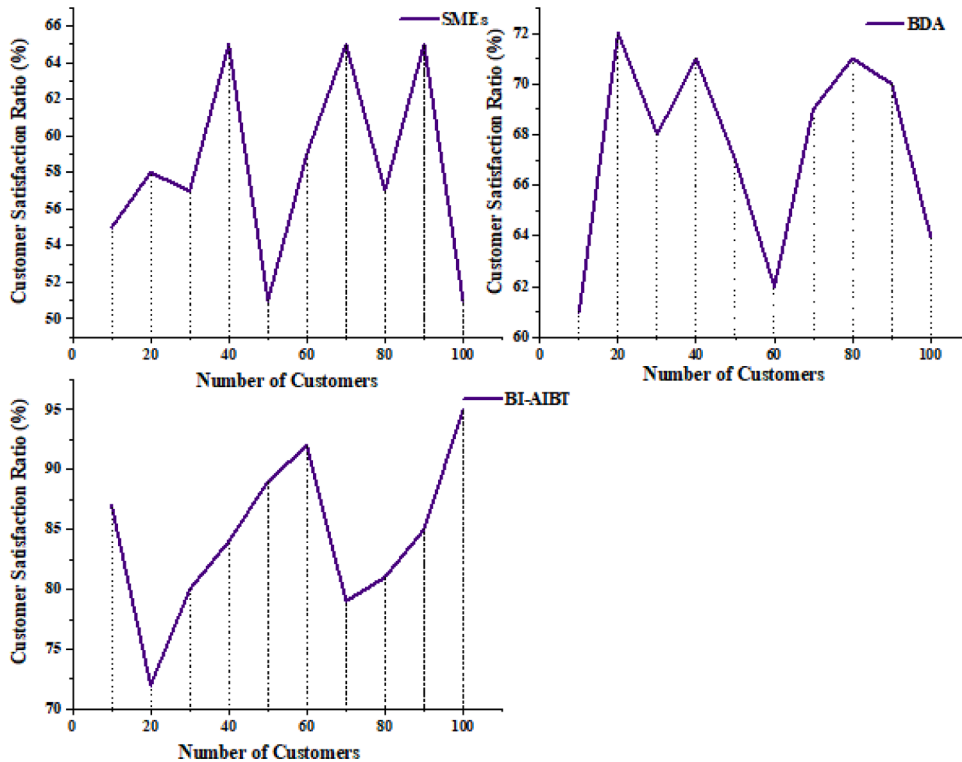


Fig. 8. Customer satisfaction ratio.

frequently looking for quality and price. Companies thus strive to gain customer loyalty by providing economical prices for different commodities. BI-AIBT indicated that concepts of consumer satisfaction are commonly debated as companies. Customer loyalty is seen in several contexts and is related to goods and services. This loyalty is profoundly personal and has a great influence on customer preferences.

**5. Conclusion**

In the field of business innovations, digital technology analysis is becoming more interesting, and data protection by technology Blockchain can be maintained. Therefore, this paper improves market processes and sustains safe contact between different customers based on artificial intelligence and blockchain technologies. There are few key respondents from two different market sectors to gather the qualitative observational evidence. BI-AIBT emphasizes using social media to connect brands and consumers; operates online and offline experiences to affect customer behavior. BI-AIBT is assessed by the company and explored the distinction and similarity in value development, strategy, and business capture effect of digitization. In addition, BT can enhance the relationship between organizational capacity and employees' capabilities. The experimental findings show that digital transformation is typically considered important and increases strategies for business innovation. The numerical outcome of the proposed BI-AIBT enhances the demand prediction ratio (97.1%), product quality ratio (98.3%), Business development ratio (98.9%), customer behavior analysis ratio (96.3%), and customer satisfaction ratio (97.2%).

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## Author statement

Zeyu Wang – Conceptualization, Investigation, Writing- Original draft preparation

Mingyu Li – Investigation, Data curation, Methodology, Visualization

Jia Lu – Software, Validation, Supervision, Conceptualization

Xin Cheng – Conceptualization, Methodology, Writing- Reviewing and Editing

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