

Communication Engineering and Development of Business

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ABSTRACT

Communication engineering is a critical area in the growth of businesses through ensuring efficient communication. Communication engineering entails designing, developing, implementing, and maintaining communication systems. In the article below, the effects of either infrastructure or technology are examined in the provision of return services and maintenance in view of helping businesses.

KEYWORDS Communication Engineering, Business

I. INTRODUCTION

COMMUNICATION has always been the secret of success for any business house, but those business houses who have not been able to communicate effectively with their customers or those who have not succeeded in reaching their clients time and again would fail. Hence communication becomes very essential for any business. But this type of communication can be done by various methods like television and social networking. Thus effective communication is essential for a good reach out in the market as well and hence this makes the interaction between business and communication industries so close and related to each other. The electronics and communication engineering helps greatly in improving the outreach of the business. This becomes an external factor for the business because there is nothing that it can do but adjust with whatever happens around it. The development in electronics and communication engineering and technology are never-ending, and due to these developments, people start using the developed technologies in their mobiles to get closer to them. For the companies, keeping themselves updated about all the technology is a challenge that enables them to get closer to their customers and to know about the future scope of electronics and communication engineering. There are wonders that the business can do in the future and the company, along with the use of the developed technology, can get an advantage over its competition [1]. The use of these technologies will enable the company to know about the chances and opportunities that it may face in its future. Also, there is always a matter of data stability and security for any company. However, the increasing emphasis on the customer-oriented nature of businesses has been made

possible by such communication oriented technologies. The role played by infrastructure facilities also becomes very important in the success of such technologies, however, besides these factors, there are many natural factors which affect the communication network. However, as far as the usage and the maintenance of such communication network facilities are concerned, they become two different ends which are linked by the business, and it is in the link between these two ends where lies the future of the business as far as its ability to attract customers through its products and services is concerned. Speculative parallelization is one way of improving the performance of such communication networks. And the most beautiful thing about the communication process is that it is a two-way street. Moreover, it has been found that there have been numerous innovations in the domain of communication engineering. The architecture proposed may be used to enhance the performance of the communication network because it reduces the overhead involved in the process of speculation-based parallelization [4]. The history of communication engineering has been highly interesting to the scientists who wanted to contribute towards making the society technologically advanced by improving the technologies related to communication, which led to the emergence of social media applications that increased interactivity of business organizations with their clients.

From the above graph, it becomes clear as to how quick the developments have been and by how many years there is the difference in development and thus how fascinating is the research area where such quick developments occurred. Convolutional Neural Network (CNN) algorithms can be implemented to increase image quality when images get

EVOLUTION OF MOBILE NETWORK GENERATIONS

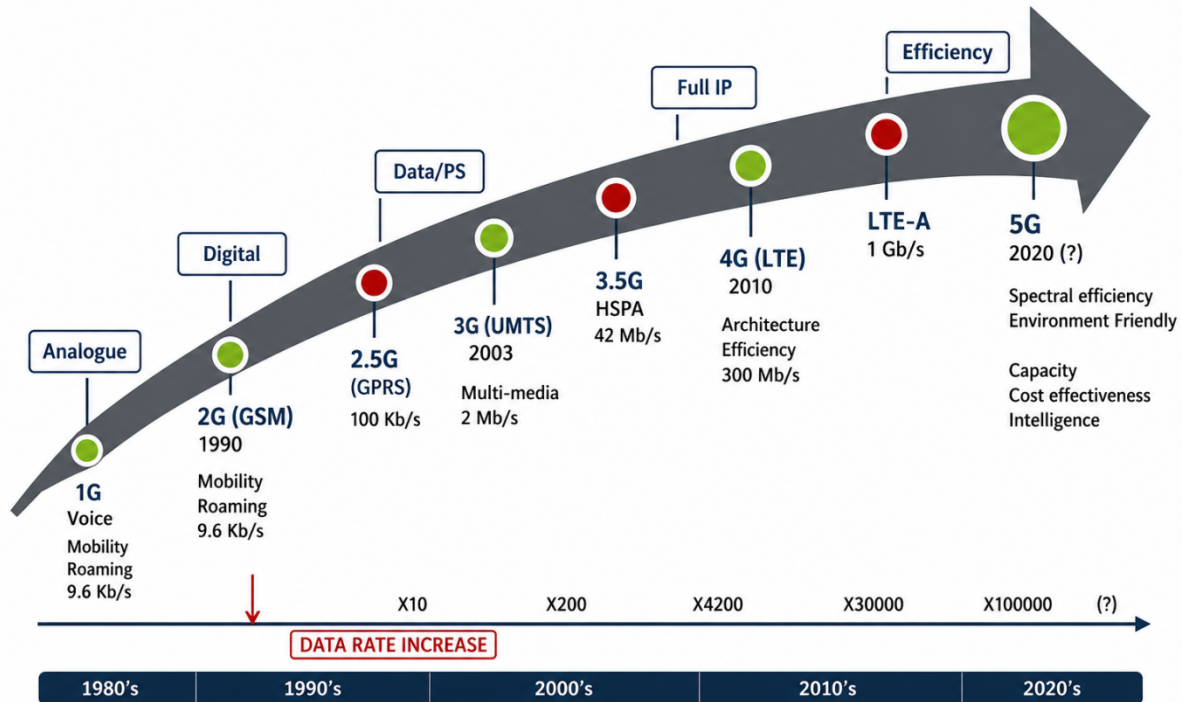


Figure 1. (a) Development of communication technology

transmitted through the communication networks [5]. With the developments, communication became fast, efficient, effective, and convenient. Just as in case of mobile phones which became wireless as compared to earlier ones, similar has been the development in other accessories such as wireless headphones and so forth.

Social media has always been an attraction to society as it helps increase users' numbers in their platforms; these social media platforms have been hotspots that spread news rapidly whether fake or genuine and people do not care about this and believe in them wholeheartedly without verifying the authenticity of such news. The method of supervised learning can be applied to enhance the performance of web pages that travel over a communication network [6]. It provided an opportunity for businesses to use these social media sites as well as interact with their customers, thus spreading their news quickly among other users. Moreover, these platforms have been able to introduce new business schemes for these businesses whereby they can buy such schemes to get close to their customers. As a result, many job and business opportunities are emerging through such developments in society.

- The power of communication
- Relationship,
- Value,
- Customer,
- Success,
- Loyalty.

The above mentioned points give us indication about the importance of power of communication in the business and its role in development of business as below;

- Communication helps businesses to create better relationships with in the business and outside the business. Because without having communication in an effective manner, business cannot achieve any success and it will be difficult for the business to execute its plans in an appropriate way.
- Business which is well managed and successful in its execution can gain reputation in the market and hence increase its business value by earning huge profits and revenues.
- Communication helps in improving relations with customers and therefore companies have customer care executives for handling customer related problems. Because maintaining good relations with the customers leads to customer satisfaction and retention.
- Businesses which are able to maintain customer satisfaction easily become successful and attain new heights in their success journey and loyalty plays vital role in their success.

And to improve this power communication engineers are trying to get more and more innovative technologies and helping the businesses to get more effective with their customers and improve their relationships and value in the

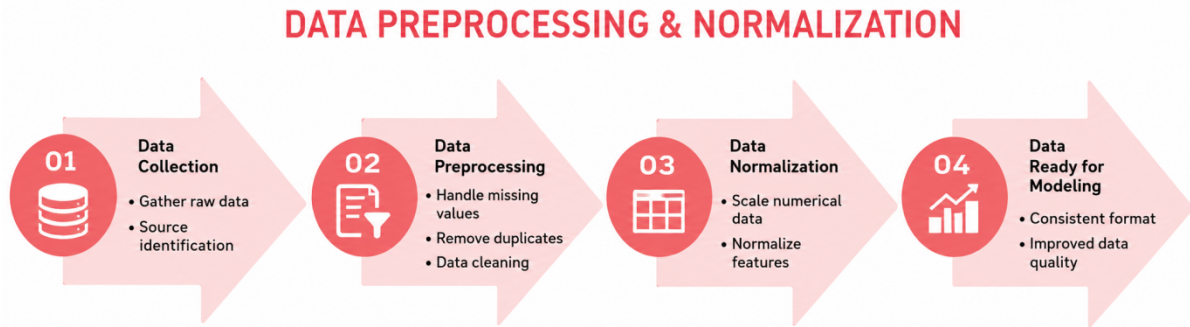


Figure 2. (b) Development of social media apps

market.

II. REVIEW OF LITERATURE

Marshall and Wyatt (2019) – The above research was done on small firms, and it was concluded that easy-to-use communication technologies do not contribute to the success of small firms, but at the same time, it was seen that small firms located in urban areas using communication technologies have played a major role in the growth of these organizations. Brain Computer Interaction (BCI) techniques can also be used in improving the communication of people with computers. This can be helpful in the growth of the business organization [7].

Turner and Endres (2017) – As per this research, it is discovered that such organizations that are lacking in information technology are more prone to failure and therefore, information technology and communication become vital for the organization's survival in the market.

Kraus et al (2019) – As per this research, it is discovered that social media marketing and email marketing have a great impact on the success of the business. If the organizations wish to attract the maximum number of customers then they need to follow these modes of communication in order to succeed. Several kinds of automatic parallelization algorithms may be used for better communication network performances [8].

Choi and Hutchinson (2014) – In this study it was found that it not difficult to introduce and use the communication and other information technology-based instruments but the important part is to maintain this technology.

Research Methodology

All the secondary data will be utilized to determine the link between communication engineering and development of business while keeping in mind the importance of communication engineering in the development of the business. MCC can be implemented for enhancing the communication process within businesses. For instance, by using MCC, employees can gain access to all kinds of information and

applications regardless of their location, leading to enhanced productivity [9].

Objective of the study: To analyze the link between communication engineering and development of business

III. DISCUSSION

Effective communication is one of the key elements that drive businesses to success as they can communicate with their clients via social media, emails, and other available online platforms. The rise of digital communications due to the impact of the COVID-19 virus pandemic leads to an increasing demand for communication engineering techniques such as cloud computing and mobile communications, which help improve accessibility and increase productivity [10]. Moreover, through communication engineering, business organizations can develop strategies that help them get to know their customers and serve them better by delivering tailor-made products or services. The latest communication technique – the metaverse – will provide new chances for businesses in marketing, communication, and attracting customers, although the issue of security must be addressed when utilizing this technology [11]. In addition, automated machine learning is an effective technique that helps reduce expenses, improves accuracy, increases decision-making capacity, and increases productivity [12].

The development in communication engineering over time is illustrated in Figure 1(a), with advancements acting as drivers for innovations and connections. New innovations like secure metaverse models take care of some of the major issues regarding privacy and security by adopting techniques like data minimization, pseudonymization, and encryption. Consequently, businesses can ensure the confidentiality of their data and boost consumer trust [13].

The fast-growing number of social media sites and apps is depicted in Figure 1(b). Such sites enable businesses to connect with their consumers and create more employment opportunities around the world.

Collectively, all the figures underscore the significance of communication in carrying out business operations, thus

ensuring effective planning, implementation, interaction, and development. Other innovative technologies have also been utilized for improving the effectiveness of business activities. For instance, convolutional neural networks (CNNs) using the concept of transfer learning have attained unprecedented results for image classification of ultrasounds related to breast cancer [14]. Another example is the use of SDN-enabled edge computing combined with artificial intelligence for increasing efficiency in networks and performing intelligent actions like image classification and fraud detection for IoT and smart city solutions [15]. Furthermore, robotics has also benefited from deep learning to boost automation and increase productivity.

Cloud computing offers hosted services via Internet and helps companies increase scalability, flexibility, and operational efficiency. However, issues like security and privacy pose major barriers to implementing cloud computing services. Future advancements in cloud computing technologies will likely be directed at providing solutions for handling big data analysis, Internet of Things (IoT), and artificial intelligence (AI), promoting innovations and facilitating business expansion in various industries [17]. Furthermore, consumer behavior can be analyzed through fuzzy clustering methods using big data. Such an analysis would help organizations create personalized marketing approaches, increase customers' satisfaction levels, and increase profitability of the business [18].

IV. CONCLUSION

Communication engineering technology has greatly influenced the interaction between individuals and companies. Communication technologies have evolved over time, leading to the emergence of social media sites that can be used by corporations to interact with customers and increase their reach in the marketplace. Moreover, communication engineering has made smart transportation systems a reality in smart cities, allowing for efficient, sustainable, and reliable travel. This development ensures less traffic congestion, clean environments, and economic activities [19].

To conclude, communication engineering technology has a major influence on business operations since it facilitates connectivity, customer communication, and information sharing. Nonetheless, for communication technologies to function effectively, adequate infrastructure is necessary. The advantage in technological infrastructure enjoyed in cities makes them better served than rural areas. Companies thus tend to locate customer support centers in such places while focusing on manufacturing and production in the countryside. Maintenance of communication technologies requires consistent effort and money.

As innovation continues to accelerate, businesses must adapt to emerging communication technologies to enhance operational efficiency, strengthen customer relationships, and reach wider audiences in a shorter time.

References

- [1] Z. Wang, H. Zhang, D. Qi and Y. Tian, "Research on the application of electronic technology in communication engineering under the background of big data," 2021 IEEE International Conference on Artificial Intelligence and Computer Applications (ICAICA), 2021, pp. 967-969, doi: 10.1109/ICAICA52286.2021.9498101.
- [2] Jorgensen, J. J., Zuiker, V. S., Manikowske, L., & LeHew, M. (2022). Impact of Communication Technologies on Small Business Success. *Journal of Small Business Strategy*, 32(3), 142–157. <https://doi.org/10.53703/001c.36359>
- [3] S Kumar, SK Singh, N Aggarwal & K Aggarwal (2022). Efficient Speculative Parallelization Architecture for Overcoming Speculation Overheads. In Proc. of International Conference on Smart Systems and Advanced Computing (Syscom-2021)
- [4] Kumar, S., Singh, S. K., Aggarwal, N., Gupta, B. B., Alhalabi, W., & Band, S. S. (2022). An efficient hardware supported and parallelization architecture for intelligent systems to overcome speculative overheads. *International Journal of Intelligent Systems*, 37(12), 11764–11790.
- [5] Kaur, P., Singh, S. K., Singh, I., & Kumar, S. (2021, December). Exploring Convolutional Neural Network in Computer Vision-based Image Classification. In International Conference on Smart Systems and Advanced Computing (Syscom-2021).
- [6] G Khade, S Kumar, S Bhattacharya (2012). Classification of web pages on attractiveness: A supervised learning approach. In 2012 4th International Conference on Intelligent Human Computer Interaction (IHCI).
- [7] Kumar, S., & Singh, S. K. (2021). Brain Computer Interaction (BCI): A Way to Interact with Brain Waves.
- [8] S Kumar, SK Singh, N Aggarwal, K Aggarwal (2021). Evaluation of automatic parallelization algorithms to minimize speculative parallelism overheads: An experiment. In *Journal of Discrete Mathematical Sciences and Cryptography* (2021).
- [9] Peñalvo, F. J. G., Sharma, A., Chhabra, A., Singh, S. K., Kumar, S., Arya, V., & Gaurav, A. (2022). Mobile cloud computing and sustainable development: Opportunities, challenges, and future directions. *International Journal of Cloud Applications and Computing (IJCAC)*, 12(1), 1-20.
- [10] Gupta, A., Singh, S. K., Chopra, M., & Gill, S. S. (2022). An Inquisitive Prospect on the Shift Toward Online Media, Before, During, and After the COVID-19 Pandemic: A Technological Analysis. In *Advances in Data Computing, Communication and Security: Proceedings of I3CS2021* (pp. 229-238). Singapore: Springer Nature Singapore.
- [11] Singh, M., Singh, S.K., Kumar, S., Madan, U., Maan, T. (2023). Sustainable Framework for Metaverse Security and Privacy: Opportunities and Challenges. In: Nedjah, N., Martínez Pérez, G., Gupta, B.B. (eds) International Conference on Cyber Security, Privacy and Networking (ICSPN 2022). ICSPN 2021. Lecture Notes in Networks and Systems, vol 599. Springer, Cham. https://doi.org/10.1007/978-3-031-22018-0_30
- [12] Gupta, A., Singh, S. K., Chopra, M., & Gill, S. S. (2022). An Inquisitive Prospect on the Shift Toward Online Media, Before, During, and After the COVID-19 Pandemic: A Technological Analysis. In *Advances in Data Computing, Communication and Security: Proceedings of I3CS2021* (pp. 229-238). Singapore: Springer Nature Singapore.
- [13] Mengi, G., Singh, S.K., Kumar, S., Mahto, D., Sharma, A. (2023). Automated Machine Learning (AutoML): The Future of Computational Intelligence. In: Nedjah, N., Martínez Pérez, G., Gupta, B.B. (eds) International Conference on Cyber Security, Privacy and Networking (ICSPN 2022). ICSPN 2021. Lecture Notes in Networks and Systems, vol 599. Springer, Cham. https://doi.org/10.1007/978-3-031-22018-0_28
- [14] Singh, M., Singh, S.K., Kumar, S., Madan, U., Maan, T. (2023). Sustainable Framework for Metaverse Security and Privacy: Opportunities and Challenges. In: Nedjah, N., Martínez Pérez, G., Gupta, B.B. (eds) International Conference on Cyber Security, Privacy and Networking (ICSPN 2022). ICSPN 2021. Lecture Notes in Networks and Systems, vol 599. Springer, Cham. https://doi.org/10.1007/978-3-031-22018-0_30
- [15] Gupta, S., Agrawal, S., Singh, S.K., Kumar, S. (2023). A Novel Transfer Learning-Based Model for Ultrasound Breast Cancer Image Classification. In: Smyth, S., Tavares, J.M.R.S., Shi, F. (eds) Computational Vision and Bio-Inspired Computing. *Advances in Intelligent Systems and Computing*, vol 1439. Springer, Singapore. https://doi.org/10.1007/978-981-19-9819-5_37
- [16] Singh, R., Singh, S. K., Kumar, S., & Gill, S. S. (2022). SDN-Aided Edge Computing-Enabled AI for IoT and Smart Cities. In *SDN-Supported Edge-Cloud Interplay for Next Generation Internet of Things* (pp. 41-70). Chapman and Hall/CRC.

- [17] K Aggarwal, SK Singh, M Chopra, S Kumar, F Colace (2022). Deep Learning in Robotics for Strengthening Industry 4.0.: Opportunities, Challenges and Future Directions. In Robotics and AI for Cybersecurity and Critical Infrastructure in Smart Cities (2022).
- [18] A Sharma, SK Singh, E Badwal, S Kumar, BB Gupta, V Arya, KT Chui, D Santaniello (2023). Fuzzy Based Clustering of Consumers' Big Data in Industrial Applications. In 2023 IEEE International Conference on Consumer Electronics (ICCE).
- [19] M Chopra, S Kumar, U Madan, S Sharma (2021). Influence and Establishment of Smart Transport in Smart Cities. In International Conference on Smart Systems and Advanced Computing (Syscom-2021).

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