



A Study on the Performance of Biometric Devices with Reference to Employee Interface

A S Sochipem Zimik, Chingreipam Keishing

Abstract: *Biometric technology is a contemporary method of identifying and verifying individuals by studying human behavior. The study is focused on primary data obtained at random from numerous employees working, and appropriate questionnaires are provided for additional analysis. As the safety of both persons and corporate assets grows more important, biometrics devices are becoming increasingly promising. The study will help in understanding whether biometric devices will not only just fulfill the basic purpose of identification and verification but rather help in influencing employees to work efficiently by critically evaluating their behavior and result in a positive impact on the organization's productivity. The study finds that biometric technology may be regarded as one of the characteristics of competitive advantage. Because of its low cost, reliability, and responsiveness, the technology is viewed as a method of boosting an organization's security, dependability, cost-effectiveness, and productivity, necessitating a promotion and marketing strategy. Using biometric equipment, the research investigates the effects and performance of employees. According to the findings of the survey, employees are more interested in working for a company that offers flexible scheduling. The study also discovers that the market growth of biometric devices is promising. The research was carried out utilizing qualitative methods.*

Keywords: *Biometric Technology, Multimodal Biometrics, Employees Performance*

I. INTRODUCTION

The first record of a biometric identifying system may be traced in Paris, France, in the early 1800s. Biometric technologies are now used in almost every area of human existence (Lee, 2020; Nadeau, 2012; Thales, 2020). Biometric devices are one of the most recent and improved ways for controlling unethical practices since they are cost-effective, safe, durable, and inexpensive. Verification and authentication are the two purposes of biometric systems. (Alsaadi, 2015; D.Akila, 2020; Raina, 2011; S. Roy, 2017; T.Sabhanayagam, 2018; Tripathi, 2011; Wencheng Yang, 2018). Initially, the application of biometric devices was intended for crime control and safety purposes; nevertheless, the application has recently come to the attention of organizations to enhance employee productivity and cost management by replacing the manual process

Manuscript received on 20 December 2021 | Revised Manuscript received on 01 January 2021 | Manuscript Accepted on 15 April 2022 | Manuscript published on 30 April 2022.

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(G. M. Mir, 2018; Ojha, 2019; Oloyede Muhtahir O, 2013; Mitrefinch, 2019; Ibrahim, 2019; Nwoye, 2016; Rao, 2016; Zeiger, 2017; Taiwo Gabriel, 2019; B. Kommey, 2018). It is extensively utilized in the organization because of its reliability and convenience. (Madhavan, 2019; Starlink, 2019). The concept aids in the control of an organization's business overseas, such as MNCs. (Ansari, 2019). Biometric devices aid medical and health care by alerting patients when it is time to take their medicine. (Alliance, 2012; Gimbel, 2019; Joy, 2019; Siwicki, 2018). Any undesirable conduct, such as stealing confidential data or products, failing to manage absenteeism, or buddy punching, may be controlled by the Biometric device system. (Siddiqui, 2014; Murphy, 2019). The majority of the company has implemented a fingerprint technique for tracking employee attendance. (Ismaili, 2011; Adewole, 2014; Oloyede Muhtahir O, 2013). It will assist the human resource staff in analyzing the data for its organization's activity Biometric devices are trusted and safe instruments. Facial structure, fingerprint, hand geometry, voice, signature, retina, and keystroke pattern are all examples of physiological activity. Figure 1 depicts the operation of biometric devices.

II. BACKGROUND

A biometric system is a contemporary technology that assists the user in a variety of ways, including security, fraud management, identification, and authentication of an individual. At the moment, biometric devices are employed in any business to improve organizational operations and for safety purposes. The study will emphasize the importance of biometric devices by asking about employees and then analyzing how the gadgets affect their behavior. The research is crucial because it provides insight into the dependability and efficacy of the system as a whole as well as the organization as a whole.

A. Scope

The scope involves a thorough examination of the impact of biometric systems. The research will look into biometric technologies such as fingerprint scanners, retina scanners, voice recognition systems, CCTV cameras, and so on. The research will examine and emphasize the viewpoint of an organization's employees regarding the performance of the gadgets.

III. REVIEW OF LITERATURE

Oloyede *et al.* (2013) investigated biometric devices by examining the various types of biometric technology systems and the trends in their application. And had determined that biometric devices are a worldwide ICT strategy and that the optimal biometric system is the fingerprint.



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Ashby (2017) performed an empirical study on CCTVs using questionnaires as a technique and discovered that 62.2 percent of robbery incidents were solved with the assistance of CCTVs. As a result, Ansong & Ofori-Dwumfuo (2015) investigated the usage of CCTV to find existing flaws in the present security system. The survey technique was used in the study, and the results show that many people support the use of CCTV, and it has a good influence on crime prevention. According to Mouad *et al.* (2016), fingerprint biometric devices are validated from a database using a matching method known as 1:1 matching. It is accomplished by comparing the claimant's fingerprint to the enrolled fingerprint; initially, the person's finger is enrolled and saved in the database, which is then retrieved from the database and compared with the claimant's fingerprint for verification. Alblushi (2021) studied facial recognition biometric devices in-depth. The study emphasizes the many problems in facial recognition verification, such as facial expression, background, picture size, illumination effects, and postures, camera resolution, and so on. Bhattacharyya *et al.* (2009) emphasized the benefits of using biometric devices for authentication and security reasons. The article provides an overview of the biometric device trend and assesses the relevance of each device feature. After studying several pieces of literature, it may be deduced that no research work has been done in the region under consideration for the study. As a consequence, the study is validated for future research initiatives.

A. Objectives

- To investigate employee knowledge of biometric devices;
- To examine the influence of biometric devices on employee performance; and
- To estimate the purchase propensity of biometric devices.

IV.METHODOLOGY

The study's focal point is a randomly selected region in India. A questionnaire is used to collect primary data, which is then analyzed in light of the objectives. To overcome the Covid protocol, responder convenience, and time constraints, data are gathered and transmitted using a Google form. The questionnaire is designed at random in response to the study problem, which is a lack of employee awareness about the importance of biometric devices and their cost. Depending on the region, numerous employees are contacted to get the questionnaire via the form. The obtained data is then evaluated using a simple graphical representation and analyzed qualitatively.

A. Block Diagram of Biometric Technologies

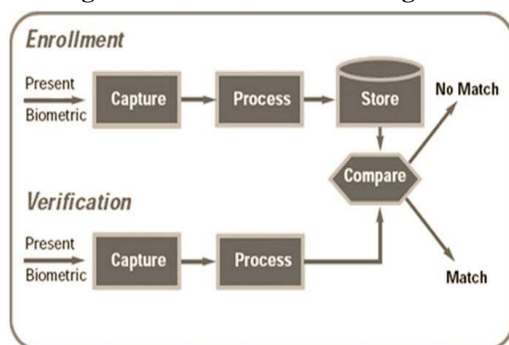


Figure 1: Block Diagram of Biometric Technologies verification procedure

Source: Google Image

The term "biometrics" is derived from the Greek words "Bios-metrics," which means "life measurement." Human physiological features were employed as a form of identification verification in the technologies. The operating concept is the same as in regular operation, in that the individual must first be registered by registering in the database. The above verification hold for various biometric devices such as Fingerprints, CCTVs, Voice recognition, biometric IRIS, etc.

- **Enrolment:** This is the initial stage for putting the user's biological data into the database in the form of templates by initially acquiring, accessing, processing, and saving the data in the database. In the future, the enrolled data will be utilized for identity verification.
- **Presentation:** The presentation refers to the data supplied by the user for verification. The generated data is collected using acquisition equipment. Depending on the biometric technology used, the presentation may be processed by gazing into the camera, placing a finger on the device's sensor, or reciting a passcode.
- **Biometric Data:** The biometric data entered by the user cannot be compared to the data recorded in the database. The information supplied during enrollment and verification must be processed further by transforming it into templates. The templates are then compared to those recorded in the database.
- **Feature Extraction:** This method extracts biological data features such as voice frequency and pattern, filtering, and optimizing pictures and data. There is a clear relationship between excellent feature extraction and the capacity to immediately produce templates, which is critical for the device's performance. (Tripathi *et al.*, 2011).

V.MULTIMODAL BIOMETRICS

The employment of two or more biometrics in the verification/identification system is referred to as multimodal biometrics. It combines the results of many biometric traits, making it more trustworthy than unimodal biometric technologies (Mishra, 2010).

It is one of the improving technological developments, and it is necessary to enhance the recognition rate owing to non-universality. Typically, this is accomplished by obtaining input from two or more sensors that measure two or more physiological parameters of the person. For example, a person's finger may be amputated, or an injury to the finger may lead the fingerprint devices to misread the print and provide incorrect results. Failure of any biometric technology in the Multimodal biometric system may not impact serious identification/ verification. The operating concept stays the same, with the sensor of two or more unimodal biometric devices reading the physiology of a person, like a face, iris, or fingerprint. Acquired data is further processed and fused before being saved in a database for further study and verification (Fadewar, 2018; Mathew, 2014).



VI. RESEARCH DESIGN

It is a strategy for determining a valuable and correct solution to the problem. The exploratory approach is used in this investigation. A qualitative approach is considered because it entails collecting data from diverse respondents and using the acquired data to generate theory, graphs, and charts.

A. Sample

Table 1: Sample Detail

Total Sample	Number	Percentage
Male	74	66
Female	38	34
Total	112	100

The study considers a random responder from several parts of the city (Bangalore, Delhi, Mumbai, Northeast India, and other parts). There are 112 responses, with 66 percent being male and 34 percent being female. Half of the respondents are between the ages of 25 and 30, with the remainder falling into other age categories. Furthermore, approximately 87 percent of those polled work in a private organization. Biometric equipment such as CCTVs/Fingerprint/Voice recognition is known to 96 percent of all respondents. While only 4% are aware of biometric devices.

VII. RESULTS AND DISCUSSION

A. Reliability

In terms of reliability, roughly 66 percent rate it as good, 22 percent rate it as outstanding, and 12 percent rate it as fair. Biometric technology is more user-friendly and dependable than any other technology. The most common biometric equipment are fingerprint scanners, voice recognition systems, and CCTV cameras. The company can no longer rely on the conventional model of reliability since it wastes time and costs money. Humans are being replaced by biometric technologies to reduce costs. Some respondents, who work in administration and human resources, saw the necessity for biometric devices for verification and as a method of attendance, which results in salary processing and also improves the quality of life. Fingerprint over the card switching approach, which is not a dependable means of ensuring the organization's security.

B. Significance of the Installation

Almost all respondents agreed that putting biometric devices in the company was necessary since they improve performance and serve as the automatic direction toward benchmark performance. Exploring the study by interacting with the employee reveals that the installation of biometric devices in the business has a substantial influence on the employee's performance. It is established as a standard protocol and ethical guideline for the organization's employees. From the perspective of the organization's administrative staff, it is noticed that it provides a sense of security to the organization, ease of governance, and employee conduct under observation. In comparison to the traditional way of preserving records, fingerprint devices are

beneficial for HR in managing and tracking attendance. It is critical to keep a record of every activity in the company for the sake of security for both the employee and the owner. The installation of biometric devices on the premises can help to prevent data loss, fraud, and theft.

C. Flexibility

One of the most significant cultural practices of a successful business is flexibility, which is also an important characteristic of professionalism. The culture not only assists the individual but also the organization in responding to changes in the environment. Employees are interested in joining a business that has a flexible culture, according to interactions with them. The approach forces the company to be adaptable to the needs of its employees. Employees who desire to work additional hours to earn more money might be regulated and managed using biometric devices following the organization's norms and regulations. 60% of the respondents are working in an organization where the culture is practiced.

D. Performance

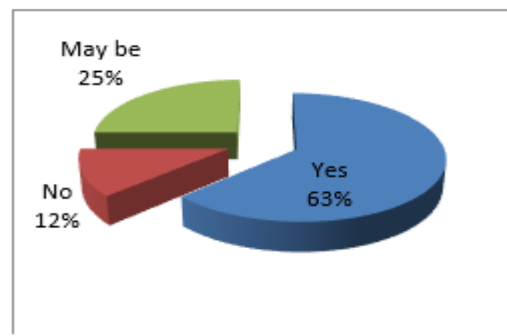


Chart 1: Performance of Employee

Chart 1 depicts the employee's performance as a result of the installation of biometric devices in the business. 63 percent of respondents believe that the existence of biometric devices has an impact on the organization's performance. Installing biometric devices not only improves security but also influences employee time management, monitors employee behavior in the organization, ease of managing records (especially for HR), operation activities such as delivery and supply, receiving order or queries, and return of organization properties after its daily routine. The installation of biometric equipment will enhance the organization's efficiency. It should be emphasized that biometric devices are the most effective and systematic method of managing the environment and authenticating persons without the involvement of any external body.

E. Purchase

From the standpoint of market growth, it is possible to conclude that biometric devices are necessary and significant to everyone. Despite its importance and ease of availability in the market, 91 percent of respondents have not purchased for personal use. The device's growth can be predicted to be positive.



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The paucity of purchases might be attributed to the insufficient promotion and advertising in the region. This broadens the opportunity for the gadgets to thrive in the market. Because the product is well-known in the region, less effort is required to advertise it, and there is a greater concern for security and well-being; the impact of biometric devices has become vital for everyone. Online advertising, as well as the engagement of contractors and builders, will be required to install the devices while undertaking the project of constructing residences or stations.

F. Affordability

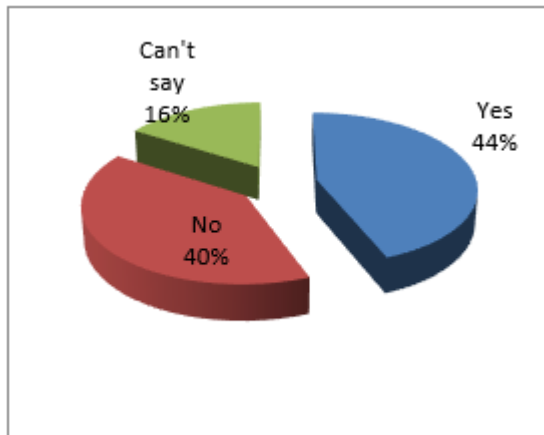


Chart 2: Affordability

Concerning affordability, chart 2 illustrates how the respondent can afford to install the devices for their well-being. 44 percent demonstrate that the respondent can afford to avail the service, 40 percent can afford to access the facility, and 16 percent are unable to acquire the equipment. Despite a large number of prospective buyers, it should be emphasized that only a few will purchase the goods. However, when compared to other products, biometric devices have a big possibility and may share the market owing to an increase in security concerns, a safety measure to combat fraud, theft, crime, and heinous behavior in the environment. Policymakers should establish a regulation requiring biometric devices (CCTVs) to be deployed in public places or local areas without requiring individuals to install the equipment. The marketing staff will attempt to persuade potential customers to buy by speaking about the usefulness and security concerns.

VIII. CONCLUSION

Biometric equipment will assist the business in not only meeting the fundamental goal of identification and verification but also in influencing workers to work more effectively by critically assessing employee behavior. As a result, biometric technology may be regarded as one of the characteristics of competitive advantage. As a result, this study found that biometric technology has become indispensable and got good feedback from employees (respondents) working in a variety of businesses. Because it is cost-effective, dependable, and attentive, biometric devices will eventually supplant traditional security methods. As a result, it is proposed that proposing biometric devices as a way of increasing an organization's security, dependability, cost-effectiveness, and productivity

necessitates a promotion and marketing campaign. According to the report, biometrics has a potential market share.

REFERENCES

1. Adewole, A. B. (2014). Development of Fingerprint Biometric Attendance System for Non-Academic Staff in a Tertiary Institution. *Research Gate* Volume 5 No.2, 62-69.
2. Alblushi, A. (2021). Face Recognition Based on Artificial Neural Network: A Review. *Artificial Intelligence & Robotics Development Journal* Volume 1, 116-130. [CrossRef]
3. Alliance, S. C. (2012). *Smart Cards and Biometrics in Healthcare Identity Applications*. Princeton Junction: A Smart Card Alliance Healthcare Council Publication.
4. Alsaadi, I. M. (2015). Physiological Biometric Authentication Systems, Advantages, Disadvantages And Future Development: A Review. *International Journal of Scientific and Technology Research/Development: A Review* volume 4 Issue 12, 285-289.
5. Ansari, M. M. (2019, Jan 21). Time Dynamo. Retrieved Jul 30, 2020, from Time Dynamo Web site: <https://www.timedynamo.com/blog/how-does-a-fingerprint-attendance-system-work>
6. Ansong & Ofori-Dwumfuo. (2015). The use of CCTV in Crime Combating in a Ghanaian University. *Research Journal of Applied Sciences, Engineering, and Technology* 11, 1196-1209. [CrossRef]
7. Arya, N. (2019, June 25). Franchise India. Retrieved April 29, 2020, from Franchise India Web site: <https://www.franchiseindia.com/content/market-potential-of-security-and-surveillance-market-in-india.13510>
8. Ashby. (2017). The Value of CCTV Surveillance Cameras as an Investigative Tool: An Empirical Analysis. *European Journal on Criminal Policy and Research*, 441-459. [CrossRef]
9. B. Komme, O. A.-L. (2018). SwyftTapp: An NFC-based attendance system using fingerprint authentication. *International Journal of Engineering, Science and Technology* Volume 10 No 1, 23-39. [CrossRef]
10. D.Akila, V. C. (2020). A Survey on Biometric Authentication Systems in Cloud to Combat Identity Theft. *Journal of Critical Reviews* Volume 7 issue 3, 540-546. [CrossRef]
11. Debnath Bhattacharyya, R. R. (2009). Biometric Authentication: A Review. *International Journal of u- and e-Service, Science and Technology* Volume 2, 13-25.
12. Fadewar, W. D. (2018). Multimodal biometric system: A review. *International Journal of Research in Advanced Engineering and Technology* Volume 4; Issue 1, 26.
13. G. M. Mir, A. A. (2018). The Benefits of Implementation of Biometric Attendance System. *Oriental Journal of Computer Science and Technology* Volume 11 No 1, 50-54. [CrossRef]
14. Gimbel, E. (2019, Dec 18). Health Tech. Retrieved Jul 30, 2020, from Health Tech Web site: <https://healthtechmagazine.net/article/2019/12/how-biometric-technologies-improve-healthcare-operations> [CrossRef]
15. Ibrahim, S. C. (2019, Sept 15). Hindawi. Retrieved Jul 30, 2020, from Hindawi Web site: <https://www.hindawi.com/journals/js/2019/7410478/>
16. Ismaili, I. A. (2011). Biometric Attendance System. *Research Gate*, 499-501.
17. Joy, K. (2019, Dec 23). Health Tech. Retrieved Jul 30, 2020, from Health Tech Web site: <https://healthtechmagazine.net/article/2019/12/biometrics-healthcare-how-it-keeps-patients-and-data-safe-perfcon>
18. Kashish A. Shakil, F. J. (2017). BAMHealthCloud: A biometric authentication and data management system for healthcare data in the cloud. *Journal of King Saud University*, 56-63.
19. Lee, J. (2020, Feb 14). bio connect. Retrieved Jul 27, 2020, from bioconnect Web site: <https://bioconnect.com/a-brief-history-of-biometrics/#:~:text=While%20the%20earliest%20accounts%20of,classification%20and%20comparison%20of%20criminals>.
20. Madhavan, R. (2019, May 20). Emerj. Retrieved Jun 30, 2020, from Emerj Web site: <https://emerj.com/ai-sector-overviews/ai-in-biometrics-current-business-applications/>



21. Mathew, S. S. (2014). A Study of Multimodal Biometric System. International Journal of Research in Engineering and Technology Volume: 03 Issue: 01, 2. [CrossRef]
22. Mishra, A. (2010). Multimodal Biometrics it is: Need for Future Systems. International Journal of Computer Applications volume 3 no 4, 29. [CrossRef]
23. Mitrefinch. (2019, Apr 1). Mitrefinch. Retrieved Jul 28, 2020, from Mitrefinch Web site: <https://mitrefinch.com/blog/10-benefits-biometric-fingerprint-time-clock/>
24. Mohile, S. S. (2018, June 19). Business Standard. Retrieved April 29, 2020, from Business Standard Web site: https://www.business-standard.com/article/companies/hikvision-bets-on-indian-security-systems-market-to-expand-mfg-footprint-118061900644_1.html
25. Mouad .M.H.Ali, V. H. (2016). Overview of Fingerprint Recognition System. International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT). [CrossRef]
26. Mouad Ali, V. H. (2016). Overview of Fingerprint Recognition System. International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT).
27. Murphy, D. (2019, Apr 8). Biometric Update. Retrieved Jul 30, 2020, from Biometric Update Web site: <https://www.biometricupdate.com/201904/eliminating-mobile-fraud-with-biometric-authentication>
28. Nadeau, L. K. (2012, Oct 23). Government Technology. Retrieved Jul 27, 2020, from Government Technology Web site: <https://www.govtech.com/Tracing-the-History-of-Biometrics.html>
29. Nwoye, C. I. (2016). Enhancing Attendance Management in Firms and Industries Using Fingerprint Biometric Recognition Technique. Journal of Mobile Computing & Application Volume 3 Issues 1, 15-22.
30. Ojha, D. D. (2019). Performance Analysis of Biometric Systems: A Security Perspective. International Journal of Advanced Research in Computer and Communication Engineering Volume 8 issue 4, 106. [CrossRef]
31. Oloyede Muhtahir O, A. A. (2013). Fingerprint Biometric Authentication for Enhancing Staff Attendance System. International Journal of Applied Information Systems Volume 5 No.3, 10-23. [CrossRef]
32. Raina, V. K. (2011). Integration of Biometric authentication procedure in the customer-oriented payment system in trusted mobile devices. International Journal of Information Technology Convergence and Services Volume 1 No. 6, 15-24. [CrossRef]
33. Rao, U. (2016, Jun 19). Sage Journals. Retrieved Jul 30, 2020, from Sage Journals Web site: <https://journals.sagepub.com/doi/10.1177/1357034X18780983>
34. Řiha, V. M. (2011). Security of Biometric Authentication Systems. International Journal of Computer Information Systems and Industrial Management Applications Volume 3, 174-184.
35. S. Roy, S. M. (2017, Aug 16). Springer. Retrieved Jul 28, 2020, from Springer Web site: <https://link.springer.com/article/10.1007/s41403-017-0026-8>
36. Sachitanand, R. (2018, October 30). The Economic Time. Retrieved April 29, 2020, from Economic Time Web site: <https://economictimes.indiatimes.com/news/politics-and-nation/sales-of-surveillance-cameras-are-soaring-raising-questions-about-privacy-regulation/articleshow/66195866.cms>
37. Saunders, P. L. (2009). Research methods for business students. In P. L. Mark Saunders, Research methods for business students (pp. 210-223). England: Pearson Education Limited.
38. Segun O. Olatinwo, O. S. (2013). Iris Recognition Technology: Implementation, Application, and Security Consideration. The Pacific Journal of Science and Technology volume 14 number 2, 228.
39. Siddiqui, A. T. (2014). Biometrics to Control ATM Scams: A Study. International Conference on Circuit, Power and Computing Technologies, 1598-1602. [CrossRef]
40. Siwicki, B. (2018, Jul 30). Health Care IT News. Retrieved Jul 30, 2020, from Health Care IT News Web site: <https://www.healthcareitnews.com/news/biometrics-entering-new-era-healthcare>
41. Stake, R. E. (2010). Qualitative Research: Studying How Things Work. New York: A Division of Guilford Publications, Inc.
42. Starlink. (2019, May 15). Star Link. Retrieved Jun 30, 2020, from Star Link Web site: <https://www.starlinkindia.com/blog/use-of-biometric-attendance-machine/>
43. T.Sabhanayagam, D. V. (2018). A Comprehensive Survey on Various Biometric Systems. International Journal of Applied Engineering Research Volume 13 No. 5, 2276-2295.
44. Taiwo Gabriel, A. O. (2019). Development of Lecture Attendance System for Staff Performance Rating in a Tertiary Institution using Fingerprint Technology. International Journal of Engineering and Management Research Volume 9 Issue 1, 73-85.
45. Thales. (2020, May 14). Thales. Retrieved Jul 27, 2020, from Thales Web site: <https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/biometrics/afis-history>
46. Tripathi, K. P. (2011). A Comparative Study of Biometric Technologies with Reference to Human Interface. International Journal of Computer Applications Volume 14 No. 5, 10-15. [CrossRef]
47. Wencheng Yang, J. H. (2018, Jun 12). Hindawi. Retrieved Jul 28, 2020, from Hindawi Web site: <https://www.hindawi.com/journals/wcmc/2018/7107295/>
48. Yan, Z. R. (2019). A Survey on Biometric Authentication: Toward Secure and Privacy-Preserving Identification. Open Access Journal, 5994-6007. [CrossRef]
49. Zeiger, H. (2017, Jan 18). Medical Express. Retrieved Jul 30, 2020, from Medical Express Web site: <https://medicalxpress.com/news/2017-01-ethics-tracking-athletes-biometric.html>

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