Eduvest – Journal of Universal Studies
Volume 3 Number 2, February, 2023
p- ISSN 2775-3735- e-ISSN 2775-3727

PROVIDING A PERSONALIZED HEALTHCARE SERVICE TO THE PATIENTS USING AIOPs MONITORING

Abdullah Khan
Independent Researcher UAE, United Arab Emirates
Email: abdullah.researcher2@gmail.com

ABSTRACT

We see the critical role technology plays in healthcare in the midst of a continuous worldwide health crisis. To combat the epidemic, South Korea, for example, used smart city' technology and government-developed applications that follow individuals in quarantine. A biosensor that can identify the virus in saliva samples has just been created by India's National Institute of Animal Biotechnology, Hyderabad. These developments are made feasible by the usage of certain biosensors that have printed circuit boards with metal core components capable of withstanding large variations in moisture and temperature. A very sophisticated breakthrough, artificial intelligence for IT operations, is altering the healthcare sector in addition to the technology that aid nations in combating the epidemic. This general phrase, also known as AIOps, describes the automated detection and repair of typical IT problems using big data, machine learning, and other AI technologies. AIOps may be used in the healthcare industry to teach computers to analyse CT scan pictures, follow the progression of various illnesses, assess the effectiveness of patient therapy, and much moren.

KEYWORDS *AIOps, Health care, CT scan. IT operations, Smart city technology*

INTRODUCTION

More and more CIOs are using robotic process automation (RPA), which completes repetitive, normal operations much more quickly in order to save costs and save time, to simplify corporate processes (Becker et al., 2020). Robotic process automation (RPA) technologies and robots may be efficiently employed in the healthcare industry to free up a clinician's time and improve the quality of treatment provided (Shrimali, 2021). By gathering and optimising patient data, these systems may also enhance the healthcare cycle by giving clinical personnel useful information that will enable them to make more precise diagnoses and

How to cite: Abdullah Khan (2023). Providing A Personalized Healthcare Service To The Patients Using AIOPs Monitoring. *3* (2): 327-334
E-ISSN: 2775-3727
Published by: https://greenpublisher.id/

deliver customised care (Periasamy et al., 2022). Additionally, RPA robots can more effectively scan incoming data, provide condensed reports that take location, diagnosis, and insurance carrier into account, and route appointment requests (Battina, 2016). The simplicity of claims processing, which often entails data entry, processing, and review and is time-consuming and more prone to human mistake, is another advantage that RPA systems may provide (AL-Dabagh & AL-Mukhtar, 2017).

Healthcare and AI

In general, the use of AI to automate routine administrative and operational processes may lead to better customer experiences and service quality, cheaper costs, and more effective project implementations (Al ‐ Hashimi et al., 2022). Once AI is incorporated into the clinical workflow of hospitals, it has the potential to become an even more potent tool that can update and improve electronic health records by creating apps that make it simple for medical professionals to get the patient data they need (Alhayani et al., 2022). AI may also be utilised to streamline ordering procedures to increase productivity and streamline bill creation. Additionally, health organisations may begin employing machine learning to modify personnel in order to handle the rising patient loads in emergency rooms and shorten wait times for ambulatory treatments (Firas & AL-Dabagh, 2017).

Zero Incident Framework TM (ZIF) is an AIOps Platform that enables organisations to automatically discover applications, comprehend dependencies between various IT assets, monitor all hardware, software, and infrastructure elements, notify users of any potential pattern deviations, anticipate potential outages, and even self-heal! The severe lack of radiologists may be alleviated by using these skills in the healthcare sector to quickly identify different disorders in patients' images. Frameworks like ZIF may be used to detect body temperatures and notify authorities like corporate executives if a person has a feverish enough body temperature. AIOps may be used outside of the hospital to gather and evaluate reports of certain illnesses and assist hospitals in preparing for the effects of an epidemic on their daily operations (Galety et al., 2022; Ordibazar et al., 2022)

Observability in AIOps.

This trend is evident at the HIMSS Conference this year in Orlando, Florida, where cloud transformation and artificial intelligence are hot themes. Despite embracing the advantages of AI and other cutting-edge technology, providers nevertheless face a number of difficulties as they manage change, such as the following:

(i) Extreme intricacy. Enterprise settings nowadays are complex and dynamic. Due to the frequent breakdown and rebuilding of apps, containers, microservices, and other components as part of the software development lifecycle (SDLC), IT teams find it difficult to pinpoint real problems and produce software that allows healthcare providers to provide treatment. This is a major obstacle: Finding the reason of a software bug may take some time, which might lead to blame-throwing amongst teams. The associated disruption may interfere with patients' experiences or, worse still, jeopardise patient treatment. Scale and expansion in the face of change. IT teams must manage and upgrade settings that are continually changing due to the prevalence of new personnel, patients, and

merger-and-acquisition activity in the healthcare industry. Teams can no longer create, test, operate, and upgrade software using time-consuming manual methods in the face of so much change. They need automated AIOps observability methods based on contextualised, real-time data which may help in healthcare and livestock industry (Patel et al., 2022) (Patel & Samad, 2022).

(ii). New security dangers. Healthcare has been a target for cybercriminals. To safeguard health information, foster innovation, and guarantee top-notch patient care, security must be organically incorporated into the SDLC. Security must be seen as a pillar of innovation rather than as a barrier in order to do this successfully. Integrated security strategies are particularly crucial as businesses increasingly adopt a DevSecOps philosophy.

(iii) Compliance. Violations of the Health Insurance Portability and Accountability Act (HIPAA) are expensive and may harm a hospital's standing with its patients. The credit card industry, Sarbanes-Oxley, the Occupational Safety and Health Administration, and other rules are among the ones that providers need to be concerned with in addition to HIPAA. This implies that if a software flaw, outage, or configuration error results in the loss of PHI, security problems, or patient harm, a business may be subject to regulatory fines and penalties.

RESEARCH METHOD

The fallowing figure 2 shows the high-level architecture of the predictive alerting AIOPS pipeline process that includes components as (1) data collection and preprocessing, (2) Time Series modeling, (3) Predictive alerting. The following subsections describe these components and their working in detail.

RESULT AND DISCUSSION

COVID-19 increased the demands on medical professionals and elevated the importance of digital healthcare. The last three years have been high-stakes and intense for an industry that was already dealing with clinical staff turnover and burnout (Balasubramanian, 2022; Barry et al., 2022; Oyeniyi et al., 2022).

With so much at risk, the instruction for IT and security teams became increasingly clearer: physicians want systems that are accessible at all times, from any location, with no possibility of downtime, and with no possibility of being subject to cyberattacks. Teams with limited IT and security resources must use their imaginations to rise to the occasion (Cases, n.d.; Maheswari, 2022; Mormul & Stach, 2020).

Working longer hours or just adding more resources won't cut it. Additionally, the use of cloud computing by businesses opened the door to cutting-edge technology but unintentionally placed additional pressure on teams to manage more change, more data, and successfully integrate new systems. The emergence of AIOps and other forms of artificial intelligence has accelerated as a result of this perfect storm of problems. The need for AIOps observability has also grown as a result (Florea et al., 2022; Rivera et al., 2021).

AIOps, often known as "AI for IT operations," makes use of artificial intelligence to assist IT teams operate more quickly and productively with huge data. AIOps was first announced by Gartner in 2016. Since then, the phrase has

become more well-known. The capacity to assess a system's state based on its outputs is known as observability. IT teams can check the status of each component in an ever-more complicated AIOps setups thanks to AIOps observability.

AIOps observability may be approached in two different ways:

(i) Conventional AIOps: Machine learning models find connections between information technology events that includes malfunctions in a system's components that happen often and have the same underlying cause. These correlations aid in problem solving or performance optimization but often miss the exact root of the problem.

(ii)Causal AIOps: AIOps in the present era go beyond simple correlation. It makes exact conclusions regarding the source of issues possible for teams via the application of deterministic AI. Thus, deterministic AIOps goes further by determining the actual root reason that has caused an event, as opposed to just correlating two or more events based on the time at which they occurred. In turn, it specifies precisely what teams should do as opposed to offering suggestions.

(iii) The healthcare industry is working to develop a national AI strategy as AI plays an ever-more-important role in the delivery of healthcare. In fact, a session titled "Toward a National Strategy for Implementing Machine Learning and AI in Primary Care" will be held at the HIMSS 2022 conference. This session will discuss the implications of developing a national strategy for machine learning and AI and will likely cover the collaboration needed between clinical and IT teams as well as the infrastructure upgrades required to support the implementation of AI in a primary care setting. Let's look at how some healthcare institutions have improved patient care through the use of AI (Romney et al., 2019)

AIOps use cases in the healthcare industry

Customers of Dynatrace Healthcare use AI and automation to continuously find software issues and fix them before they have an impact on patient care. Below are some of their use cases in more detail (Gawade & Sonaje, 2017).

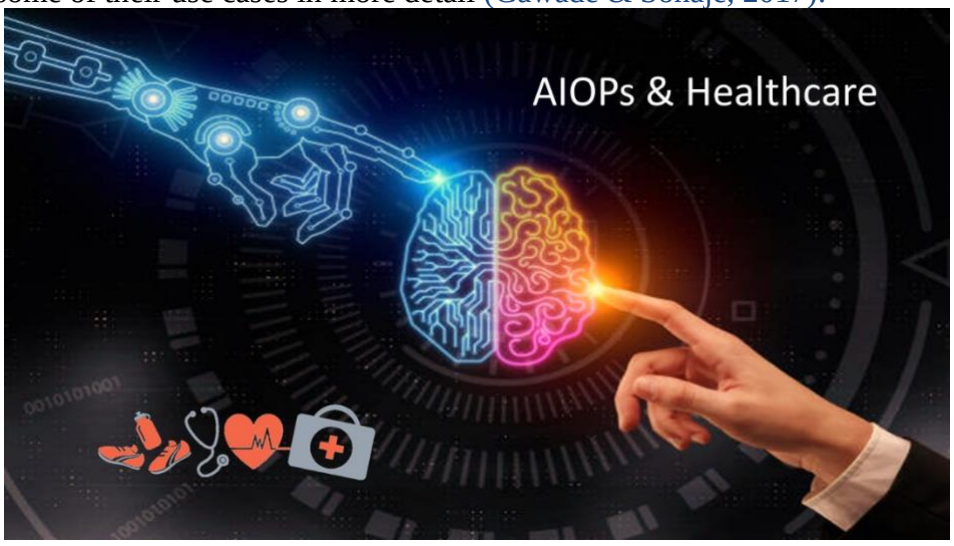

Figure 1 Relation to AIOPs with health care in graphical representation

Continuous care, anytime, anywhere

One Dynatrace customer is one of the top five healthcare providers, owning and operating nearly 200 hospitals and thousands of clinical facilities across the United States (Wang et al., 2021). It has transformed into a modern, digital provider and now uses applications to enable remote healthcare (Zahid et al., 2022). These tools are used by paediatricians to track the heart rates of their young patients. When physicians are gone, the app notifies them if the kids' heart rates go over a certain point, allowing the doctor to oversee the kid's treatment from a distance (Zhang et al., 2022).

The availability of this app depends heavily on AIOps observability. The IT teams operating this app are able to know in real-time if there are issues that might impair the operation of the system and the exact root cause of the issue thanks to AIOps' continuous automation and integrated AI. By doing this, the MTTD/R (mean time to detect/resolve) is lowered and the risk of care delivery interruption is decreased. The additional time might be used by IT teams to deliver new software and improve current systems

The main architect of the healthcare service said, "We attained levels of availability we've never been able to touch before."

Intelligent automation for improved client experiences

A UK-based health and life insurance company whose primary goal is to improve people's health is another one of Dynatrace's clients. The business runs a digital platform where consumers may accrue points for engaging in healthy eating and activity in support of its goals. After that, users may exchange their points for extras and bonuses like movie tickets and gym memberships.

The business has experienced a digital transition over the last three years, moving to a hybrid, cloud-native environment based on Amazon Web Services and a microservices architecture. As a result, innovation has been accelerated, and members now get new benefits more regularly. However, it has also added complexity, making it challenging to keep ahead of performance issues. Poor customer experiences might result from failing to improve performance for digital services, which could lead to low customer retention rates. Additionally, the time spent by developers manually locating the source of performance problems would prevent them from creating new features that would boost consumer happiness.

By combining observability and AI in a single platform that detects whether users haven't gotten the points they've earned for physical activity, the firm has revolutionised its approach to AIOps. Their AIOps observability software may then issue an alert to their support staff so they can get in touch with the client and solve the issue. Sometimes the software repair may be applied automatically, without help from someone. Because of this, members continue to participate in their health programmes and may mitigate any unfavourable customer experiences.

What is ahead for healthcare and observability in AIOps

Teams in IT, security, and medicine will still be under pressure to do more with fewer resources. Healthcare will continue to be a difficult sector due to factors including ongoing M&A activity, security risks, and increasingly intricate illnesses.

AIOps has emerged as a key technological solution for reducing the complexity of contemporary cloud activities and the ensuing alarm noise. Healthcare providers should assess if typical AIOps methodologies developed for

correlation will support long-term success as they examine AIOps solutions. Instead, they could want to adopt a contemporary AIOps observability strategy that is intended to promote more efficiency, quicker innovation, and better patient outcomes .

Discover more about Dynatrace's AIOps strategy and Davis, the ground-breaking AI engine at the heart of our observability platform. If you're going to HIMSS 2022, check out the AI-focused sessions and choose which AIOps strategy works best for your company's cloud strategy.

CONCLUSION

This study conclude that AIOPs have very essential role in healthcare unit as it is helping several cases in order to monitor them. This study brought light towards the use of technologies in health care unit will bring revaluation in the health care fields

REFERENCES

AL-Dabagh, M. Z., & AL-Mukhtar, F. H. (2017). Breast cancer diagnostic system based on MR images using KPCA-wavelet transform and support vector machine. *International Journal of Advanced Engineering Research and Science*, *4*(3), 237106.

Al-Hashimi, M., Mohammed Jameel, S., Husham Almukhtar, F., Abdul Zahra, M. M., & Adnan Jaleel, R. (2022). Optimised Internet of Thing framework based hybrid meta-heuristic algorithms for E-healthcare monitoring. *IET Networks*.

Alhayani, B. S. A., Hamid, N., Almukhtar, F. H., Alkawak, O. A., Mahajan, H. B., Kwekha-Rashid, A. S., İlhan, H., Marhoon, H. A., Mohammed, H. J., & Chaloob, I. Z. (2022). Optimized video internet of things using elliptic curve cryptography based encryption and decryption. *Computers and Electrical Engineering*, *101*, 108022.

Balasubramanian, V. N. (2022). Toward explainable deep learning. *Communications of the ACM*, *65*(11), 68–69.

Barry, M., Bifet, A., Chiky, R., El Jaouhari, S., Montiel, J., El Ouafi, A., & Guerizec, E. (2022). Stream2Graph: Dynamic Knowledge Graph for Online Learning Applied in Large-scale Network. *2022 IEEE International Conference on Big Data (Big Data)*, 2190–2197.

Battina, D. S. (2016). Ai-augmented automation for devops, a model-based framework for continuous development in cyber-physical systems. *International Journal of Creative Research Thoughts (IJCRT), ISSN*, 2320–2882.

Becker, S., Schmidt, F., Gulenko, A., Acker, A., & Kao, O. (2020). Towards AIOps in Edge Computing Environments. *Proceedings - 2020 IEEE International Conference on Big Data, Big Data 2020*, 3470–3475. https://doi.org/10.1109/BigData50022.2020.9378038

Cases, B. M. U. (n.d.). *Butterfly Network Distributes 500 Butterfly iQ+ Devices to Healthcare Workers in Kenya to Transform Maternal and Fetal Health*.

Firas, A.-M., & AL-Dabagh, M. Z. N. (2017). Real-Time Face Recognition System Using KPCA, LBP and Support Vector Machine. *International Journal of Advanced Engineering Research and Science*, *4*(2), 237062.

Florea, A., Morariu, D., & Cretulescu, R. G. (2022). Sibiu Innovation Days 2021: 28.10. 2022–30.10. 2022 Hybrid Conference. *International Journal of Advanced Statistics and IT&C for Economics and Life Sciences*, *12*(1).

Galety, M. G., Al Mukthar, F. H., Maaroof, R. J., Rofoo, F., & Arun, S. (2022). Marking Attendance using Modern Face Recognition (FR): Deep Learning using the OpenCV Method. *2022 8th International Conference on Smart Structures and Systems (ICSSS)*, 1–6.

Gawade, S., & Sonaje, N. (2017). Designing of curriculum aspects of pharmacy undergraduate course in respect of graduate employability. *Indian J Pharm Educ Res*, *51*, 502–509.

Maheswari, K. (2022). Impact of artificial intelligence in designing of 5G. *Smart and Sustainable Approaches for Optimizing Performance of Wireless Networks: Real-time Applications*, 33–50.

Mormul, M., & Stach, C. (2020). A context model for holistic monitoring and management of complex it environments. *2020 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*, 1–6.

Ordibazar, A. H., Hussain, O., & Saberi, M. (2022). A Recommender System and Risk Mitigation Strategy for Supply Chain Management Using the Counterfactual Explanation Algorithm. *Service-Oriented Computing–ICSOC 2021 Workshops: AIOps, STRAPS, AI-PA and Satellite Events, Dubai, United Arab Emirates, November 22–25, 2021, Proceedings*, 103–116.

Oyeniyi, O., Dhandhukia, S. S., Sen, A., & Fletcher, K. K. (2022). A Study of Artificial Intelligence Frameworks and Their Capability to Diagnose Major Depressive Disorder. *Service-Oriented Computing–ICSOC 2021 Workshops: AIOps, STRAPS, AI-PA and Satellite Events, Dubai, United Arab Emirates, November 22–25, 2021, Proceedings*, 3–17.

Patel, H., & Samad, A. (2022). Brief Overview On Role of Feed Formulation Software In Management of Feed Prices. *Asian Journal of Healthy and Science*, *1*(3), 94–104.

Patel, H., Samad, A., Hamza, M., Muazzam, A., & Harahap, M. K. (2022). Role of Artificial Intelligence in Livestock and Poultry Farming. *Sinkron: jurnal dan penelitian teknik informatika*, *7*(4), 2425–2429.

Periasamy, K., Periasamy, S., Velayutham, S., Zhang, Z., Ahmed, S. T., & Jayapalan, A. (2022). A proactive model to predict osteoporosis: An artificial immune system approach. *Expert Systems*, *39*(4), e12708.

Rivera, L. F., Jiménez, M., Villegas, N. M., Tamura, G., & Müller, H. A. (2021). Toward autonomic, software-intensive digital twin systems. *IEEE Software*, *39*(2), 20–26.

Romney, G. W., Guymon, J., Romney, M. D., & Carlson, D. A. (2019). Curriculum for hands-on artificial intelligence cybersecurity. *2019 18th International Conference on Information Technology Based Higher Education and Training (ITHET)*, 1–8.

Shrimali, S. (2021). A Novel Automated System for Hospital Acquired Infection Monitoring and Prevention. *Service-Oriented Computing–ICSOC 2020 Workshops: AIOps, CFTIC, STRAPS, AI-PA, AI-IOTS, and Satellite Events, Dubai, United Arab Emirates, December 14–17, 2020, Proceedings*, 523–533.

Wang, H., Ghosh, A., Ding, J., Sarkar, R., & Gao, J. (2021). Heterogeneous interventions reduce the spread of COVID-19 in simulations on real mobility data. *Scientific reports*, *11*(1), 1–12.

Zahid, A., Akhtar, S., & Basit, W. (2022). Design Patterns in an ERP Environment. *Service-Oriented Computing–ICSOC 2021 Workshops: AIOps, STRAPS, AI-PA and Satellite Events, Dubai, United Arab Emirates, November 22–25, 2021, Proceedings*, 255–271.

Zhang, T., Chen, Q., Jiang, Y., Miao, D., Yin, F., Quan, T., Shi, Q., & Luo, Z.-Q. (2022). ICASSP-SPGC 2022: Root cause analysis for wireless network fault localization. *ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 9301–9305.