

THE ROLE OF AI IN LEGACY SOFTWARE APPLICATION MODERNIZATION

Gnani Prathap Naik Mude

(Bachelor's & Master's degree in computer science

Herndon, Virginia, USA 2017)

Abstract: This study looks at Samsung to find out how AI can help make its apps better. In the beginning, the paper displayed about how AI can simplify tasks, boost productivity, and make the user experience better. Samsung cares a lot about things like improving data speed, predicting maintenance needs, network effects, and AI automation. Samsung has improved 5G network control with the help of Cognitive Statistics, an AI-based method that gives users more options and better services. This piece talks about Samsung and how its goods and services use artificial intelligence (AI) to be the best at what they do. It shows that Samsung is committed to innovation and access. Two things that can be hard are hiring skilled people and putting in old processes. Finally, the advantages of Samsung's predictive maintenance and AI are shown. These include lower costs, longer computer life, and the ability to fix issues before they happen. A clear AI plan, employee training and adaptation to new AI trends are at the heart of the idea of continuous innovation.

Keywords: AI, IT, Predictive Maintenance, Samsung, Cognitive Analytics

I. INTRODUCTION

It has been introduced that Artificial Intelligence (AI) is important for modernizing old IT systems because it eliminates tedious tasks, increases productivity and improves the user experience. AI analyses and interprets data with the help of machine learning algorithms, enabling the

integration of new technologies with old systems. Because there is less margin for error and less costs. Predictive maintenance is an AI-based process to ensure application performance and longevity. Using AI to modernize legacy software programs can improve productivity through automation, data analysis, and workflow optimization. The benefit of the network is increased productivity, reduced operational costs and a better user experience. AI innovation allows businesses to augment their existing systems, adapt to future developments, and stay abreast of the ever-changing technology industry. Because AI simplifies tasks, increases efficiency and enables innovation, companies cannot afford to ignore AI when upgrading old software. AI enables companies to simplify operations, make data-driven decisions and respond quickly to market changes. Organizations can use this technology to improve their IT systems to meet new risks and opportunities. The paper intends to analyse the role of AI in "Legacy Software Application Modernisation" for an organisation recognised as 'SAMSUNG' with valuable solutions.

II. METHODS

AI-driven Automation in Legacy Software Modernization

There is a lot of information in this part about how companies, especially Samsung, use AI-driven processes to update old software. It starts by explaining what automation is and how it can help speed up the process of change. The conversation

moves on to finding mistakes-prone repeated tasks, followed by the study or real-life examples that show how AI handles these tasks, making the change from old to new systems go smoothly. The methods that Samsung used to add AI-powered automation to their old software update processes. It gives a quick outline of the problems businesses have with old software systems and how they need to change to keep up with new technologies [9]. Market changes, new technologies, and the need for companies like Samsung to stay competitive through software upgrading are some of the main areas of attention.

Predictive Maintenance for Application Performance and Longevity

This part is all about the methods used for AI-based prediction maintenance in the context of updating old software. It goes into a part of profundity around how companies like Samsung utilize prescient support to discover and settle program issues that might happen within the future sometime recently they happen. This portion exhibits approximately the science behind prescient upkeep, such as machine learning, and how Samsung has effectively utilized these apparatuses. The way the ancient program is overhauled is changing much appreciated to prescient upkeep powered by AI. Samsung could be an incredible example of how to do it right. Finding and fixing old projects that could be encountering issues right now they happen is the objective of this technique. This makes certain that the appearance works well and is final as long as conceivable [10]. A parcel of complicated machine learning calculations sees ancient information to figure out how computer programs will act in the future.

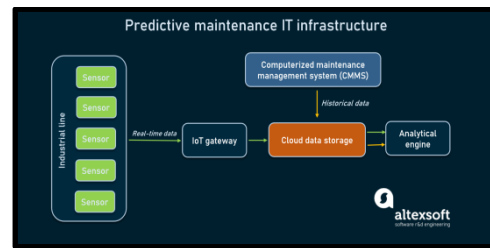


Figure 1: Predictive Maintenance for Application

Workflow Optimization through Data Analysis

People have looked back at Samsung's past to show how AI-powered data analysis has helped it make better decisions and run smoother business operations. One option is to collect and examine the data and use the insights gained during the update process. A very important task is to improve the process while updating outdated software. The ability of AI to work with very large numbers and find trends lets businesses get useful information from their current systems, which helps them make better decisions [12]. In Samsung's experience, AI-driven data analysis has been very helpful in making things run more smoothly. The company has gathered and processed data from old software systems quickly and effectively by using complex algorithms to find bottlenecks and inefficiencies. The research extracts the way AI's ability to spot trends in how users behave and how well systems work has helped make strategic choices during the modernization process. The methods used start with strong data collection tools that make sure that all the different information from old systems is fully recorded. Then, AI programs look at this data to find trends, oddities, and possible ways to make things better. These insights are built right into the modernization process, which helps the development team make changes that fix problems that have been found.

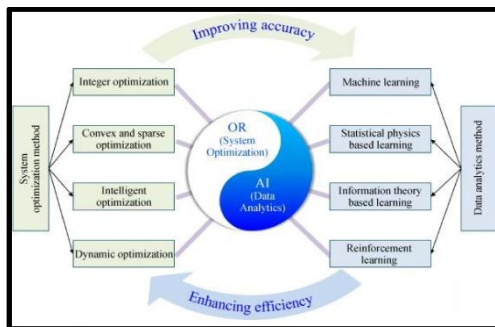


Figure 2: Workflow Optimization

The Network Effect: Increased Productivity and Reduced Operational Costs

This describes how Samsung's IT infrastructure's linked systems help boost output and lower costs. This part talks about the specific methods that were used to get these results. It talks about joining frameworks, setting rules for communication, and making parts that are associated with work superior as an entire [14]. The consideration looks at how AI can be utilized to form an organised effect that increments yield and diminishes costs. Here are a few cases from genuine life. Samsung, an innovation pioneer in the world, employs insightful impact to extend yield and lower costs with AI-driven improvement. When it comes to interfacing things, Samsung's IT foundation makes it simple to blend and coordinate diverse frameworks so that they work superior together. A huge portion of this arrangement is utilizing advanced communication apparatuses in a savvy way. These devices make beyond any doubt that information can be sent over the arrangement rapidly and precisely. A huge portion of making beyond any doubt that all of Samsung's IT parts work well together is framework integration. Set up a cohesive environment so that distinctive parts can work together without any issues, making the entire working scene more bound together and streamlined [11]. This connection goes as far as AI-powered analytics, which lets Samsung get useful

information from huge files, which improves the decision-making process even more.

One of the most important parts of Samsung's method is optimising networked components so that each one works as efficiently as possible. Predictive maintenance models are used with AI algorithms to deal with possible problems before they get worse. This cuts down on downtime and business disruptions. This solidifies Samsung's place at the top of technological innovation and organisational efficiency.

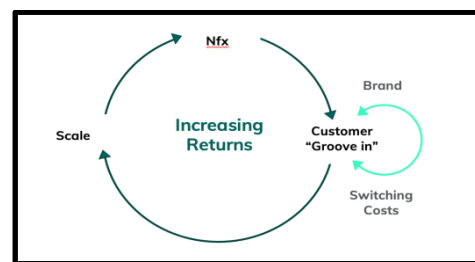


Figure 3: The Network Effect

Adapting to Future Developments and Industry Trends

This is mostly about the ways that companies use AI innovation to adapt to new changes and industry trends. It goes into detail about the specific steps Samsung took to add AI powers to current systems and make sure they could adapt to new technologies. This part talks about what Samsung has done to stay competitive in the tech business, which is always changing, and how AI is helping to make IT systems more future-proof [15]. The investigation exhibits how AI methods can be used in the real world to help businesses adapt to changing market trends and set themselves up for long-term success. By using advanced analytics, businesses can predict and deal with problems before they get worse. This cuts down on system downtime and makes the system more stable overall. Samsung is dedicated to this way as shown by its smart use of predictive repair techniques [13]. This way not only makes things better for the

user, but it also saves money because it keeps from having to pay for expensive fixes in an emergency.

III. RESULTS

A device built on artificial intelligence called Cognitive Analytics is utilized by Samsung Gadgets to make strides in the control of 5G systems. The self-learning fake insights in Cognitive Analytics mixes human mindfulness to rapidly examine and settle specialized issues. This device is extraordinary for making arranged execution measures simpler to get since it can see the full benefit stream of an organised conjointly robotisation and rule-based examination [1]. Cognitive Analytics shows its commitment to Samsung and AI by advancing closed-loop mechanization over corporate systems that serve a colossal number of clients. The system changes settings consequently based on real-time information investigation to form beyond any doubt that benefit levels remain the same. This AI-driven overhaul gives us way better arranged administrations and lays the foundation for how future portable systems will work in their claim special ways.

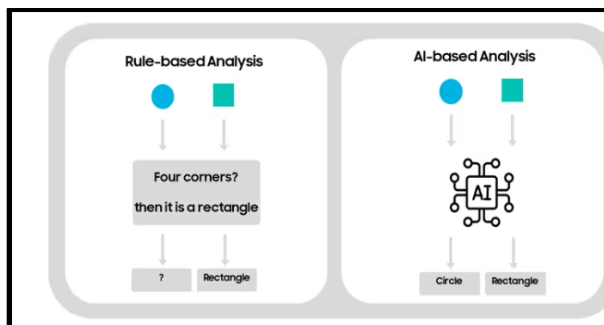


Figure 4: Rule-based and AI-driven analyses

In the Cognitive Analysis, clients can use rule-based research to apply information-based rules while looking at networks. The AI-powered study of the tool could make cell operators' networks more available by using machine learning on different sets of data to quickly find and fix technical problems.

Samsung's advanced delivery solutions in artificial intelligence have made the company and its computers work better [2]. New technologies have shortened product development cycles and improved product quality in areas such as intelligent development through standardization. In addition to improving the wearable and smartwatch markets, Samsung's innovation plans have strengthened the company and its position against competitors such as Apple. Many fields, including semiconductors and displays, have benefited from the improved speed of invention and the precise creation of AI. This plan demonstrates Samsung Electronics' commitment to continued technological innovation and market dominance in the consumer electronics industry. According to Samsung, automatic updating of old software applications is important to improve the user experience of the Galaxy smartphone. To achieve feature expansion without reducing usability, Samsung plans to introduce AI to bring new features to the phone while maintaining the important function of the phone. These activation strategies make simple features easier to use and reduce the need for users to navigate complex areas [3]. Samsung is using artificial intelligence to improve customer interactions with Galaxy smartphones by developing smart features like live translation calling. These options make interaction easier and faster than ever.

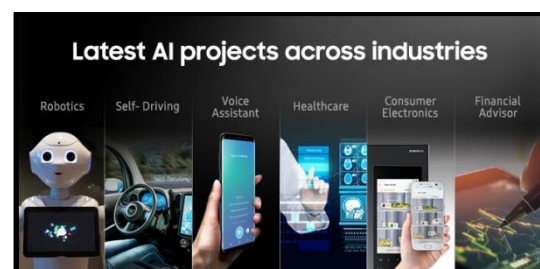


Figure 5: Samsung AI innovation in application modernisation

In response to the patent war with Google, Samsung Electronics released Bada 2.0, an exclusive mobile operating system for Wave units. To improve Samsung and its phones, developers have created Bada Architecture and SDK. Among its features are multitasking, Wi-Fi Direct, Near Field Communication (NFC) and voice recognition. To avoid legal action, Samsung scaled back its operating system. Updating Bada's software applications with AI will increase Bada's performance and enable it to better respond to industry changes, making Samsung more competitive. Samsung and Bixby have relied heavily on AI, especially Google Cloud TPUs, to improve their software applications. Using TPU cuts the processing time in half from 180 to 10 hours and increases the learning speed by 18 times. The revolutionary effect of artificial intelligence on Samsung and its current software applications is based on a deep learning strategy [4]. The sample size was reduced by 10%, decision speed improved by 11x, and Bixby & accuracy improved by 4.7%. Samsung SDS application updates are important to replace outdated systems, especially in the aviation sector. Rapid aircraft-to-aircraft switching was made possible by Samsung SDS and updated application architecture. The research on Airline A made these updates possible. Modernizing legacy system architecture and increasing the digital voice of the workforce are key technical challenges [5]. Through a combination of integration, micro-services architecture, and cloud-based strategies, Samsung SDS was able to design a highly adaptable and scalable system. This has allowed the company to remain competitive and adaptable in a constantly changing business world.

IV. DISCUSSION

Analysis

Samsung Electronics has led the AI revolution by innovatively applying machine learning technology to a variety of products and services. Interactive display services, kitchen appliances and laptops are just a few of Samsung's many AI-enabled products. This puts companies at the forefront of AI applications [6]. By forging partnerships in the automotive industry, partnering with Microsoft to ensure device connectivity, and enhancing the spatial awareness of SmartThings, Samsung is paving the way for the future. The company's commitment to inclusion, stability and security reflects the company's commitment to advancing AI and making technology accessible to all. Samsung celebrates a long tradition of intelligent business innovation with the latest advances in artificial intelligence technology. Samsung is at the forefront of innovation every time it launches a new product, whether it is a foldable smartphone or a mobile phone. Samsung has been at the forefront of incorporating innovative AI into its products to ensure an intuitive and intuitive user experience. Samsung has significantly improved network management using AI to upgrade existing software based on Cognitive Analytics. Improved 5G network services will result from faster assessment and resolution of technical difficulties through AI. Enterprise networks are now enhanced by closed-loop automation that uses a similar workflow to provide continuous service. Thanks to AI, Samsung Electronics and Galaxy smartphones offer better user experiences with more features. As an example of Samsung's strategy to innovate software in many industries, including aviation, they have created two AI-based solutions called Bada 2.0 and Bixby. A comprehensive AI strategy

demonstrates Samsung's commitment to driving innovation and maintaining industry leadership.

Challenges

Samsung has a lot of work to do as it tries to use AI to modernize its existing software projects. First, legacy systems cannot easily integrate AI technologies due to data and infrastructure incompatibilities. Integrating new AI architectures and algorithms into traditional computers is difficult, sometimes due to outdated designs. Second, AI deployments are limited by data gaps in legacy systems. In older systems, entering and retrieving data from multiple sources can be confusing and error-prone. Consistent, high-quality data is essential [7]. Third, it is worth noting that AI applications often run on older computers. AI can disrupt traditional systems due to the high demand for computing power. Updating software and hardware at the same time is important, but it can be overwhelming. Problems also arise if the current development team does not have the necessary permissions. Despite the challenges and available resources, it is important to train or hire a skilled workforce in robotics and legacy systems. Finally, the company and its innovations should not interfere with its operations. Be careful not to disrupt critical processes when integrating AI capabilities into the current operations. Samsung needs a strategy to overcome these hurdles and ensure a smooth transition to AI innovation.

Recommendation and Future Aspects

It is noted that applying AI to modernize existing software projects is a real boon for Samsung. The company plans to start using AI after evaluating its current software systems. All of them are used to make the system easier to use and increase productivity by automating daily tasks. The reliability of legacy systems can be improved using machine learning approaches that can predict and

prevent problems. Developing a clear strategy that defines its approach to AI should be the first step for Samsung And. There are many different elements that make up this plan, including establishing measurable goals, KPIs, and relationships between AI projects and the larger business and goals. Ensuring smooth operation requires a lot of power: encouraging innovation and providing adequate training to existing employees [8]. Samsung would do well to think about the consistently changing nature of AI innovation while anticipating what's to come. Refreshing and adjusting to new AI progress consistently will be essential to keeping awake with the continually changing tech industry. Examining the most recent developments in "computer vision," "reinforcement learning," and "natural language processing" may assist in determining which aspects of existing software programs could be improved. Working together with AI scholastic foundations and outer consultancies is another suitable choice. Teaming up may prompt new experiences, state-of-the-art assets, and a more extensive viewpoint on the best way to incorporate AI into current frameworks. Through its cooperation in industry meetings and work on norms, Samsung may possibly contribute essentially to the foundation of simulated intelligence-driven programming modernization rehearses. Samsung must incorporate AI into older systems in addition to ensuring the privacy and security of user data. Adherence to administrative guidelines and powerful safety efforts are fundamental for acquiring the trust of partners and clients.

V. CONCLUSION

It is concluded that a game-changing idea that has been shown to work by Samsung is using AI-based predictive maintenance to improve the process of replacing old software. The ways talked about

make it clear how important it is to fix problems as soon as they come up so that old apps not only work well but also last longer. The main idea behind this change is the use of machine learning methods. Using past data, businesses can find and stop software problems before they happen again. The way this works is very different from how reactive maintenance works. The hard work that Samsung put into these methods has paid off in real ways. The analysis shows how quickly weaknesses were fixed, system problems were avoided, and overall software speed was increased. Predictive maintenance that is driven by AI does more than just make things run more easily. A lot of money is saved because repairs are not needed as often. Making the best use of resources and cutting down on downtime are two trends in the business that this fits with. Predictive maintenance is a useful tool that helps old apps stay useful in a world where technology changes quickly. This is because the companies are trying to figure out how to update their old software. It shows how flexible it is that the technology has changed over time to add more data sources.

VI. REFERENCES

[1] C. Hwang, "Making 5G Networks More Resilient With AI-Human Collaboration | Samsung Business Global Networks," *Samsung*, 2021. <https://www.samsung.com/global/business/networks/insights/blog/0907-making-5g-networks-more-resilient-with-ai-human-collaboration/> (accessed 2024).

[2] F. Laricchia, "Topic: Samsung Electronics," *Statista*, 2023. <https://www.statista.com/topics/985/samsung-electronics/#topicOverview> (accessed 2024).

[3] J. McGregor, "New Samsung AI Solves The Worst Problem With Its Phones," *Forbes*, 2023. <https://www.forbes.com/sites/jaymcgregor/2023/11>

[/18/samsung-galaxy-s24-new-ai-features-live-translate-gauss/?sh=475206a3497c](#) (accessed 2024).

[4] J. Oh, "Samsung Bixby training gets 18x speed boost with Cloud TPU," *Goggle*, 2020. <https://cloud.google.com/blog/products/ai-machine-learning/samsung-bixby-training-gets-speed-boost-with-cloud-tpu> (accessed 2024).

[5] A. Cho, "Why App Modernization and Cloud Migration are Imperative for All Companies," *Samsungsds*, 2022. <https://www.samsungsds.com/en/insights/app-modernization.html> (accessed 2024).

[6] Samsung, "Samsung's 'AI for All' Vision Unveiled at CES 2024," *Samsung*, 2024. <https://news.samsung.com/in/samsungs-ai-for-all-vision-unveiled-at-ces-2024> (accessed 2024).

[7] V. V. Krishna, "A I and Contemporary Challenges: The Good, Bad and the Scary," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 10, no. 1, p. 100178, 2023, doi: <https://doi.org/10.1016/j.joitmc.2023.100178>.

[8] M. Barenkamp, J. Rebstadt, and O. Thomas, "Applications of AI in classical software engineering," *AI Perspectives*, vol. 2, no. 1, pp. 1–15, 2020, doi: <https://doi.org/10.1186/s42467-020-00005-4>.

[9] Wamba-Taguimdje, S.L., Fosso Wamba, S., Kala Kamdjoug, J.R. and Tchatchouang Wanko, C.E., 2020. Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects. *Business Process Management Journal*, 26(7), pp.1893-1924. <https://doi.org/10.1108/BPMJ-10-2019-0411>

[10] Pan, Y. and Zhang, L., 2021. Roles of artificial intelligence in construction engineering and management: A critical review and future trends. *Automation in Construction*, 122, p.103517. <https://doi.org/10.2760/12297>

[11] Puri, R., Kung, D.S., Janssen, G., Zhang, W., Domeniconi, G., Zolotov, V., Dolby, J., Chen, J., Choudhury, M., Decker, L. and Thost, V., 2021. Codenet: A large-scale ai for code dataset for learning a diversity of coding tasks. *arXiv preprint arXiv:2105.12655*.

<https://doi.org/10.48550/arXiv.2105.12655>

[12] Mallikarjunaradhya, V., Pothukuchi, A.S. and Kota, L.V., 2023. An overview of the strategic advantages of AI-powered threat intelligence in the cloud. *Journal of Science & Technology*, 4(4), pp.1-12. <https://doi.org/10.55662/JST.2023.4401>

[13] Gaur, L., Afaq, A., Singh, G. and Dwivedi, Y.K., 2021. Role of artificial intelligence and robotics to foster the touchless travel during a pandemic: a review and research agenda. *International Journal of Contemporary Hospitality Management*, 33(11), pp.4079-4098.

<https://doi.org/10.1108/IJCHM-11-2020-1246>

[14] Jensen, B.M., Whyte, C. and Cuomo, S., 2020. Algorithms at war: the promise, peril, and limits of artificial intelligence. *International Studies Review*, 22(3), pp.526-550.

<https://doi.org/10.12821/ijispm090201>

[15] Mohamed Hashim, M.A., Tlemsani, I. and Matthews, R., 2021. Higher education strategy in digital transformation. *Education and Information Technologies*, pp.1-25.

<https://doi.org/10.1007/s10639-022-10924-w>