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Generative AI – A Catalyst in Banking and Financial Industry

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Abstract. Gen AI is making the banks and financial markets stand on the pinnacle of technological excellence, acquiring the power of data analysis, customer service, and risk management at an unprecedented level. This paper is going to examine several aspects of banking and financial organizations in which Gen AI can have an impact, namely, client onboarding, fraud detection, lending, and payment processing. Performing a wide-ranging literature review is the core of our work, where we look at how the Gen AI technologies, including LLMs and Quantum Computing, are shaping conventional banking models while calling for increased efficiency and personalization. In addition, the paper discusses the role of the officials and the policymakers who would be responsible for guiding the deployment of Gen AI ethically and responsibly through the use of directives and innovative ideas that are intended to resolve new challenges that may arise such as algorithmic bias and data privacy among others. This paper introduces a reliable and scalable framework for Gen AI Application called AI-EOI, and touch upon Agentic AI and highlights how GenAI can help bring innovation into the banking and finance industry, besides being efficient and inclusive, it may require collaboration between all stakeholders to achieve a positive societal impact.

Keywords: Generative AI, Banking, Financial Institutes, Large Language Models, Quantum Computing, Regulation, Innovation, Ethical Deployment, Personalization, Efficiency.

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1. Introduction to Generative AI

The state-of-the-art AI technology in the field of Gen AI, having the most sophisticated and appealing upgrades, is leading the trend in the banking and financial industries. AI and Gen AI, which are more powerful (AI) and can produce content, mimic human behaviours, and generate outputs based on the patterns of interest learned, are modern ideas that are constantly being explored. While traditional AI, which relies on powerfully structured a particular pattern of prescribed rules, cannot break the boundaries, Generative Contextual AI, through unsupervised learning, can develop its logic patterns and navigate vast amounts of data to find useful deductions. The thorny problem of Gen AI started from many deep learning and neural network works, known as moving capabilities in this field. These machine-learning techniques allow billions of potential instances to be quickly screened by algorithms. Those algorithms can sense and emulate complexity, such as language, images, and even financial market trends, with great detail and precision (Jain et al., 2023).

Among the things that gen AI can do is the skill to generate fake stories, images, and sounds that are undistinguishable from humans' work. Besides various kinds of AI, including GANs (Generative Adversarial Network) and RNNs (Recurrent Neural Network), the content has become more humanised. AI in banking and finance is on a breakthrough impulse to remove operational risks, the core area of customer service and business protection. AI enhances the customers' experience as they receive the answers and services immediately (Ahmadi, 2023). AI shows a very high accuracy as algorithms are capable of detecting fraud. By evaluating the massive datasets that have historical backgrounds, Gen AI will be able to discover tiny links and associations or the apparent pattern and support the decision-making process with more intuition (Packin & Jabotinsky, 2022). Data privacy, algorithm biases, and cyber issues are the main concerns, but surveillance of the robust regulatory frameworks and ethics guides on deployment should not be neglected.

2. What is LLM

LLMs (Large Language Model) as the base for developing an extensive range of AI systems in NLP (Natural Language Processing) implies the expansion of this branch of science. They are based on neural networks and use data grain amount implemented to properties of acting like a human. Like the OpenAI GPT series – chatbots with conversational AI capabilities, LLMs enable you to do difficult tasks, e.g., completing complex texts and translations, even more complicated than sentiment analysis and content creation, which you can complete using these tools. LLMs can be defined as an exceeding discovery in NLP that is approximately comparable to usual applications, including most NLP tasks. The auto-regressive models, in which the training is conducted repeatedly on a set of data to understand and reproduce a human-like conversation, are the core learning component of Chat GPT. For instance, the GPT series of LLMs are developed to play any ability from completing text to translation, sentiment analysis, and creating content.

Chang et al. (2023) discuss that the Association for Computing Machinery Transactions on Intelligent Systems and Technology are prominent in the field of artificial intelligence where they did a study, and used a sample size of 343 to obtain official statistics that public concerns up about AI-powered LLMs as they play pivotal roles in different industries. This survey shows two factors. Thirunavukarasu et al. (2023) address the usage of LLMs to enhance clinical diagnosis, patient care, and research, which involves first electronic capturing of patient medical information and then text-to-image conversion. This reveals a hidden potential of the LLMs that goes far beyond just doing tasks as much as the current NLT performs them and even provides a way to revolutionise and completely change many sectors of the economy and our lives.

3. The Types of LLMs?

There is a variation in the shape and size, and keep in mind that these many variations cater to specific kinds of craft. Marketers can use many categories of AI models, such as the GPT (Generative Pre-trained Transformer) series and BERT. The diverse types have a comparison advantage in different businesses, which makes them the best in specific roles, which in turn means they are not necessarily suited for all kinds of banks and financial sectors and are better choices for the insurance or healthcare industry.

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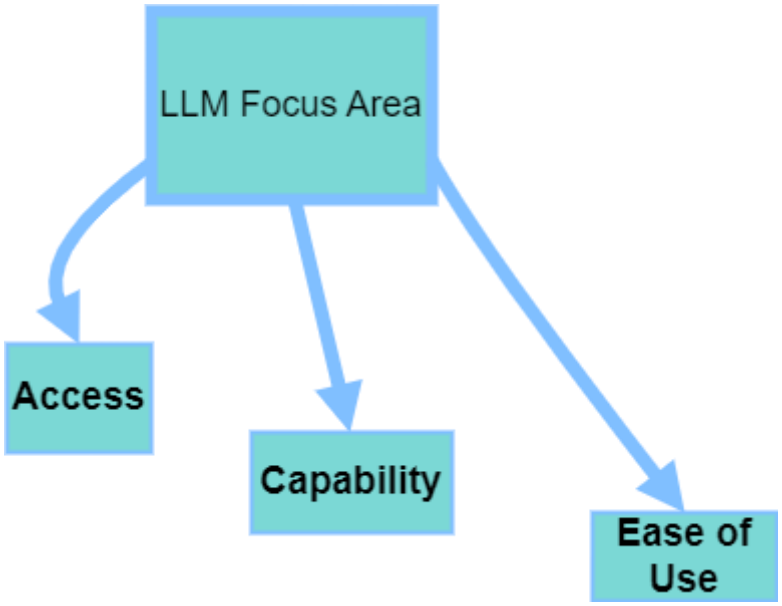
At a broader level the focus of LLM variations depends on the following –
A] Access - Open source LLMs, freely available to all to try, modify, and share with a larger community
B] Capability – Parameters that support and give direction in identifying intent and producing relevant output
C] Ease of Use – this defines the acceptability index by users



Many open-source LLMs are available and practitioners can use them, a few LLMs are listed below -

GPT-Neo and GPT-J (EleutherAI a Non-profit Research Group) - GPT-Neo: There are 3 versions available with their own unique sets of parameters- 120 million parameters, 1.3 billion parameters, and 2.7 billion parameters, whereas, GPT-J has just one version trained on 6 billion parameters

CICERO (Meta AI) - In November 2022, Meta AI unveiled CICERO, the groundbreaking AI designed to play Diplomacy at a human level. Diplomacy is a complex strategy game that demands building trust, negotiating, and collaborating with multiple players. Training the machine on 2.7 billion parameters and fine-tuning by initiating interaction with more than 40 thousand people around the world, the interaction is based on unique and complex dialogue modeling that has a specific intent behind the scenes - Diplomacy.

Megatron-Turing NLG (NVIDIA and Microsoft) - Trained on more than 530 billion parameters, Megatron-Turing Natural Language Generation (NLG) is the largest and most powerful monolithic LLM.

LaMDA (Google) - trained on around 1.56 trillion words, with a particular focus on human conversations and storytelling, it is a conversational AI chatbot, the power behind BARD

AlexaTM (Amazon) - Trained on 20 billion parameters, it can outperform a 175 billion GPT-3 model on zero-shot learning tasks. Zero-shot learning tasks occur when a learner observes samples from classes not seen during training and then predicts the class to which each sample belongs.

BERT (Google) - trained on text from Wikipedia used to understand the search intent. Bidirectional Encoder Representations from Transformers, is an autoregressive language model. Autoregressive

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techniques are used to predict the next word in a sequence of words based on the word knowledge gained in the past.

Cohere - A semi-open source with power LLM APIs allows developers to build conversational AI applications.

LLMs mark the most significant milestone in natural language processing (NLP), which has matured since the Turing test when machines showed cognitive reactions similar to a human's. They are fed on low-hanging fruits before moving up the chain of datasets that help them decode language in a way that is similar to humans. LLMs welcome any GPT-like OpenAI to create texts ranging in purpose from simple form filling to complex translations and sentiment analysis. Like the other authors, Rillig et al. (2023), replacing an old language model with something complex may result in environmental concerns but also has the potential for environmental benefits. Their findings suggest the resourcefulness of LLMs. The research can also be applied to find the latest modifications, methods, and obstacles related to LLMs' technical architecture in training models, their metrics, and self-evaluation. Though they are evaluated by different resources, Minaee et al. (2024) express with their study the realistic representation of the capabilities and limitations of the existing LLMs, which can be a great platform for further research regarding natural language processing.

4. Small Language Models

Particularly devised for diverse industry sectors, such as Customer Support or IT, SLMs furnish concentrated and meaningful insights, making them a more sensible option for industries prioritizing practical outputs above computing capability. In the evolving topography of artificial intelligence, the choice is increasingly dependent on the accuracy and efficiency of Small Language Models (SLMs).

SLMs are a subset of artificial intelligence specifically designed for Natural Language Processing (NLP) and fall under the larger artificial intelligence area. The small size and low processing power are defining characteristics of SLMs. Unlike their Large Language Model (LLM) equivalents, Small Language Models (SLMs) are created to carry out distinct language activities with a great level of efficiency and explicitness.

SLM evaluation discoveries, exactness, privacy assurance, and guarding of sensitive information are characteristics that increase SLMs' magnificence to businesses throughout the evolution and implementation processes. Small Language Model Examples - A combination of domain-specific tasks and target contexts equip effective examples of the adaptability and performance of Small Language Models (SLMs).
To highlight their distinctive contributions, there are two significant Models: Micro Language Models and Domain-Specific Language Models.

Domain-Specific Language Models - The Domain-Specific LLMs designed for the healthcare industry are a prime illustration of an SLM's usefulness. Specialized big language models that process and generate medical terminology, procedure, and patient care-related information have been fine-tuned from more general base models. These models are trained using datasets rich in medical publications, and anonymized patient records. This aligns with adherence to privacy and regulatory norms, and literature particular to the healthcare industry, resulting in outcomes that are incredibly precise, appropriate, and secure. These Models can assist in summarizing patient records, deliver diagnosis recommendations based on symptom descriptions, and stay up to date on medical research by outlining new reports. In an area where accuracy is directly related to patient outcomes, SLMs' specific training enables them to have a thorough awareness of medical language and context.

Micro Language Models (Micro LLMs) - Small Language Models have another sound application exclusive to AI customer service: Micro Language Models. To provide precise and appropriate answers

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to consumer problems, these models are customized to understand the subtlety of product specifics, customer interactions, and corporate policies. These SLMs can significantly boost the effectiveness and calibre of customer care by focusing on the distinct needs of customer support, such as determining everyday queries and offering troubleshooting advice.
This lets the model handle minor problems through its learnings, guide users through the right set of procedures and bits of advice to follow and escalate complex instances to human agents.

5. Prompt Engineering

Prompts are like talking to CXOs, SMEs, or Research Experts, asking questions to them will lead to a piece of well-structured, refined information, and relevant answers. The question asked is like a prompt, the answer received is based on their vast experience and command over the subject, and real-world scenarios are like an LLM's output. Of course, the machines are much faster and process vast information in a fraction of a second. Specifying a prompt or defining a prompt itself will allow an input command that will prompt the LLM to provide, after an input, whatever comes to mind. LLMs have an excellent mechanism to conclude based on superior prompts and then give something back, it is like scholars come up with new perspectives every time and share their knowledge with society/community. Similarly, the right prompts may direct LLMs to produce output by changing the given input text content and style according to the needs and goals of what LLMs can create. The real power will come from writing good prompts to get the best results, and CGI (Corporate Governance Information) should be implemented in fields such as financial analysis, customer service, and content production. In the research article of Wang et al. (2023) in Metaradiant, the position of image prompt development is highlighted, as well as the employment of better vision models. When selecting visual prompts for AI models to reference, one must remember that prompting is an essential part of this AI training, and tailored prompts often provide the most useful guidance for model output. They say that the oversight of engineering society is responsible for developing the efficiency of medical imaging and diagnosis with the help of large vision models, which have broad applications. Meskó (2023) discusses that speed engineering is a technology frontier in medicine.

Nevertheless, human considerations of language and cognition must also be emphasised. The reality is that AI models would have their outputs automated in such a manner that they would provide an on-point generation to the medical decision-making process (Wang et al., 2023). Healthcare professionals can learn much through this technique and become more advanced in their knowledge. They could use this knowledge for better diagnostics, patient care and primary management strategies. The miniature that impels the experts in EMS to handle their operations would accelerate the whole process, which helps in curtailing the time that the clinics are occupied and, ultimately, results in an augmented quality of the prompt care that the patients receive.

6. Introducing Conceptual Application Framework for Generative AI implementation

Introducing a multi-layered Generative AI (Gen-AI) conceptual application framework named AI EOU, inspired by the five vowels (AEIOU), we understand that the vowels play a vital role in the English language, similarly, this new framework – AI EOU, in the future may play an important role in the implementation of Gen AI-driven applications.

The AI EOU framework is an output of analysing possible applications and how important is to have a framework in place that is easy to understand and implement. The framework has 5 layers and each layer has a unique purpose.

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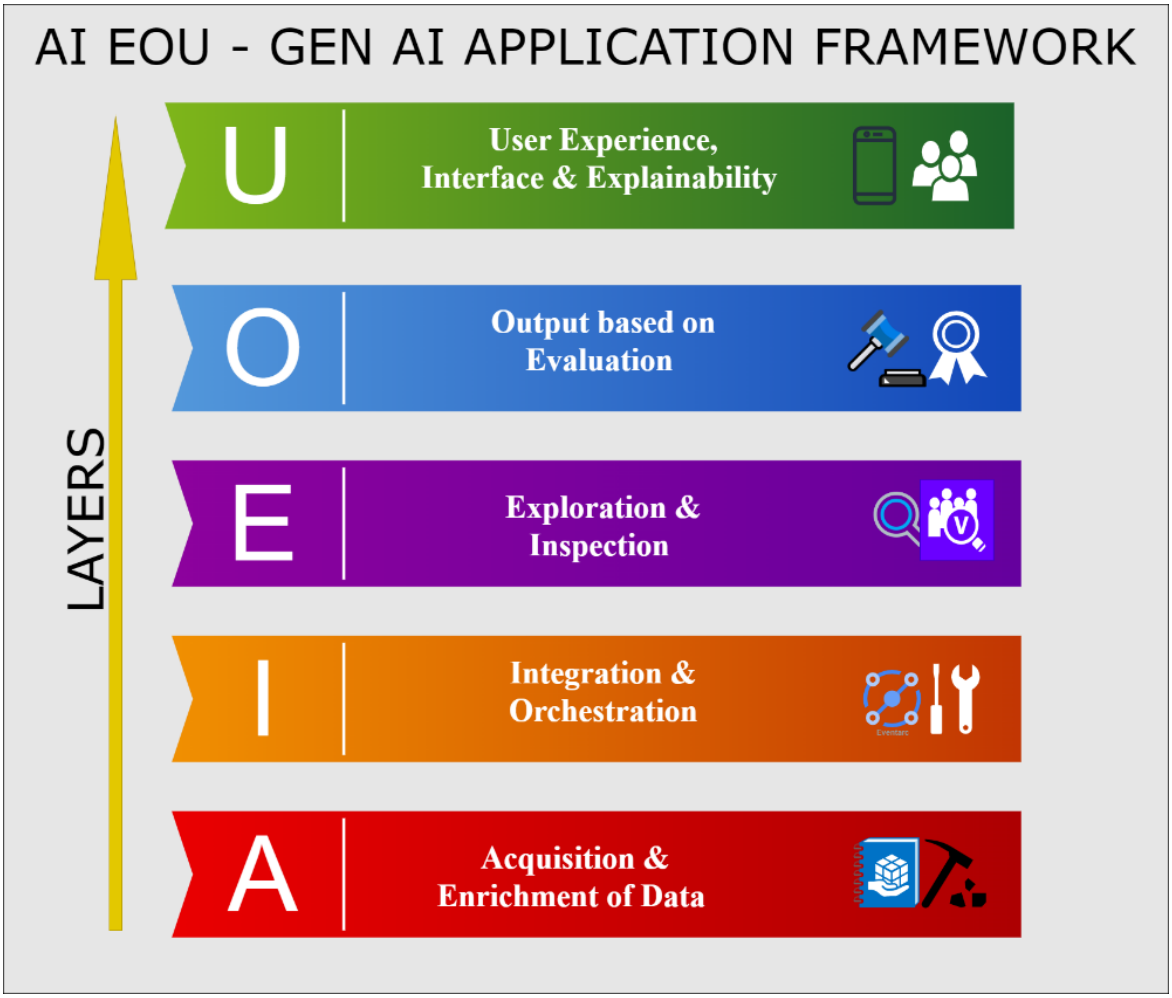

Layer 1 - Acquisition & Enrichment of Data (A)
This layer concentrates on assembling raw data (text, images, audio, videos) that is suitable to the preferred (generation) task. It conducts data cleaning, normalization, and augmentation to improve training efficiency. This layer acts as the foundation for the entire framework.

Layer 2 - Integration & Orchestration (I)
This layer manages the training pipeline, including data preprocessing, model preference, and hyperparameter tuning. It orchestrates different components like data loaders, trainers, and evaluators. It utilizes techniques like LLM Ops (Large Language Model Operations) for efficient model training and management.

Layer 3 - Exploration & Inspection (E)
The objective of this layer is to analyse the data to comprehend its attributes, patterns, and possible biases. It implements data visualization techniques to research statistical associations within the data. It ensures that the data is appropriate for training the generative model.

Layer 4 – Output based on Evaluation (O)
This layer is accountable for generating new content established on the trained model. It represents metrics for assessing the quality and applicability of the generated outputs. It opens a channel for the inclusion of feedback through human-in-the-loop to refine the model and enhance content or output (generation).

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Layer 5 - User Experience, Interface & Explainability (U)
This layer equips with an easy-to-navigate user experience, high-end technology with ease of use makes it is technology acceptance index high as compared to easy technology with a complex user experience. This layer also focuses on the user-friendly interface for interacting with the generative model. It proposes functionalities like defining prompts, managing generation parameters, and accepting outputs. It incorporates explainability mechanisms to furnish insights into the model's decision-making strategy and construct trust with users.

To thoroughly implant Regulatory, Governance, and DevOps factors in a Gen AI system, two additional layers are necessary. The first layer, Security & Governance, is dedicated to ensuring trustworthy AI practices, data privacy, and bias mitigation. The second layer, Deployment & Integration, focuses on deploying the qualified model into applications and incorporating it with existing workflows. Since in future there would be more machine-driven interactions it will be difficult to control the BAIS, and that's where a Governance with Trustworthy AI lens is crucial in the journey of Gen AI implementation.

This conceptual framework has been thoughtfully designed to make it easy to understand and apply while creating a robust and user-centric Gen-AI system. By focusing on data acquisition, exploration, efficient training, and clear evaluation of models, this framework ensures high-quality and explainable outputs.

While LLMs are powerful tools for generating quality text as humans, however, they are not always necessary for every task. Before, finalising the framework, we need to be cautious and avoid hitting LLMs when not required. Here are couple of scenarios –

1) Structured Data Analysis covers tasks like deduplication, handling missing values can be performed through traditional data analysis techniques without LLMs
2) Statistical Analysis like mean, median, mode, correlation coefficient, standard deviation, these could be performed through statistical software with more ease and accuracy.
3) Rule based systems like in health care where diagnostic rules are well defined based on symptoms, LLMs are not necessarily required.
4) Keyword extraction, identifying keywords in text can be easily done through Term Frequency Inverse Document Frequency technique.
5) Computer Vision can be achieved through specialise models like Convolution Neural Networks
6) Natural Language Processing, while we use LLMs more frequently for NPL tasks there could be alternatives like Recurrent Neural Networks for sequence-to-sequence modelling.

Understanding the Impact of Gen AI in the different segments of the Banking and Financial industry -

7. Impact of Generative AI on the Financial Industry

GenAI can potentially change how industries conduct their businesses in general because it enhances efficiency and data analytics for good decisions and quality service delivery. AI Gen extends from automated trading and custom advice in financial institutions to multiple areas of life, affecting business ways because the AI disruption after AI has already changed how normal organisations perform. Administration of knowledge work on Kar et al. (2023)'s "The influence of Professional Artificial Intelligence (Generative Artificial Intelligence) on Knowledge work management in the Industries" is a systematic delineation of conceptual analysis about the impact of GAI in knowledge work management and it is the advanced analysis of peer-reviewed and grey literature from the proponents who champion the idea.

Furthermore, Rane (2023) describes it in his Social Science Research Network article with three financial accounting issues: the role, and obstacles of ChatGPT, and other AI-similar technologies in that field were one of the key issues. This fact highlights that the GAI technology is currently part of

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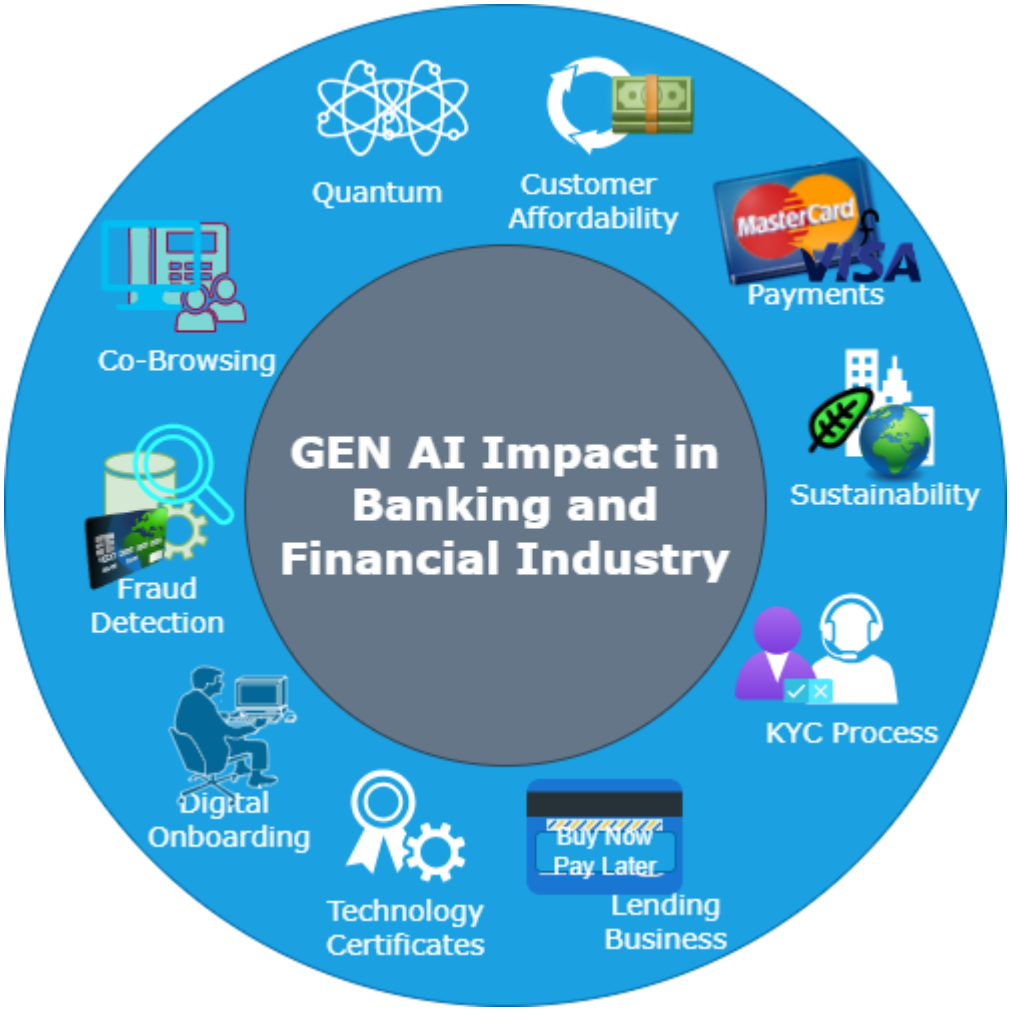
a stable phenomenon keystone that uses ChatGPT to automate tasks, make decision-making processes, and optimise operations. Through the provision of technical and analytical capabilities, GAI helps personalised financial institutions to stay competitive. Also, GAI assists financial institutions in redefining their service provision so that they will move far away from digital offerings and traditional ways to offer services so that their customers like them. GAI now facilitates financial regulations so that customers can communicate more effectively through human and computer processes; thus, the procedures can be much faster through automated methods such as customer service, risk assessment, and fraud detection (Rane, 2023). Banks can increase customer connection by going beyond the normal staff-based communication by implementing artificial intelligence chatbots and virtual assistants, providing personalised help and ensuring ultimate customer satisfaction.



8. Impact of Generative AI on Customer Onboarding and KYC Process

Gen AI settings help remove the client service process's complications by automating document verifications, identity verification, and Know Your Customer (KYC) regulations. AI on the human scale can provide a platform for natural language processing and computer vision. Automating the customer verification processes eliminates manual confirming, granting quicker and more accurate completion. Also, it removes organisational efforts and ensures absolute legal compliance. Xu (2022) of Future Fintech has highlighted that the bank and finance sector can be assisted by the artificial intelligence theory and its applications, such as in the technological aspect. The proposal point of this AI-driven technology is that it will beat as many problems in customer onboarding as traditional banking today. The author says this theory is the cradle of knowledge, and it discusses AI inventions and their purpose, including improving labour productivity and enhancing the customer experience in the

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financial sphere. However, Kaur and Tanwar analyses currency technology and how the adoption of AI is a problem in the banking sector. Considering data privacy, regulatory compliance and fairness of the algorithms, some financial organisations have already been able to automate the onboarding procedure and increase the accuracy of the KYC systems. Customers may benefit from Gen-AI-powered chatbots and can streamline KYC process through real-time assistance with better accuracy. However, their success will bring smooth workflows and customer satisfaction as the next step. Hence, it will, in the long run, make the financial organisation more effective.

9. Impact of Generative AI on Customer Affordability Check

In the realm of affordability checks, AI Gen might aid these with analysing customer data and transaction history, among many others. Supported by machine learning algorithms, AI Gen can interrogate and scrutinise credit scores, debt levels, and the pattern of expenses of the customers, thus ensuring that the banks use qualified credit rating for lending decisions and personalise financial products for their consumers. Gausling (2023) offers that generative AI software substantially changes how business is done, citing processes such as purchase verification and personal financial issue management. Gausling's views are to educate businesses on the variety of benefits that organisations can enjoy through Generative AI implementation. Such advantages include better decision-making, running operations more efficiently, and creating a better Customer Experience. Thukral, Vaikunth et al (2023) in their paper discussed about the industry buzz-word Gen-AI, demand from investors, and pressure from board rooms and executive group, it is tempting to jump on the latest AI bandwagon. But the main question is how can businesses plan and execute AI initiatives that deliver tangible results, adhere to ethical standards, and avoid technical and social setbacks?

10. Impact of Generative AI on the Payments Industry

The payment industry expedites the launch of sophisticated payment technologies, including QR codes, thereby conveniently creating a smooth cross-border transaction environment. Gen AI makes the financial system more efficient, effective, and secure by deploying automation in payment processing, fraud detection, and transaction reconciliation, leading to globalisation via financial inclusion.

Notably, Gen AI in payment solutions is transforming the existing payment methods, by enabling QR codes, it is pushing more inclusion and a march towards a digital payment ecosystem and speedy cross-border transactions. The audio messages that get generated after receiving payments via QR codes, could be generated with regional language and also may prompt the country from where payment is received. Gen AI can make all payments, including fraud detection and transaction reconciliation coverage.

Thukral et al. (2024) argue that large language models facilitate payments considerably along the user journey: they increase the number of personalised recommendations and improve the effectiveness of user interactions. Through their projects and their practices of using Generative AI to improve customer journeys, optimisation is highlighted, and the main theme of a strong individual approach is demonstrated to make payments more efficient and drive higher customer satisfaction.

Generative AI is reshaping the payments landscape at an unprecedented pace. By automating mundane tasks, personalizing experiences, and streamlining complex processes, it's ushering in a new era of efficiency, accuracy, and customer satisfaction. Key areas of transformation are Payment automation from recurring bill payments to complex cross-border transactions, generative AI is automating processes, reducing errors, and accelerating payment cycles. Personalized Payment Experiences: By analyzing customer data, AI can tailor payment options, offers, and communication, fostering stronger customer relationships and loyalty. Intelligent Invoicing: AI-powered invoice generation, processing, and reconciliation are transforming accounts receivable, reducing disputes, and improving cash flow.

Proactive Regulatory Compliance: AI can monitor regulatory changes, assess their impact, and automate compliance measures, safeguarding businesses from financial penalties.

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11. Impact of Generative AI on Lending Business and Buy Now Pay Later Business

Through Automated Gen AI, the roles traditionally played by a loan underwriter will be replaced so that the risk of any loan and the score calculation will be evaluated expeditiously. It is reaching the goal with the help of the machine that comes up with the multifold financial data. Hence, the bank believes such an individual is a high credit-risk person with a low component of the risk of default, and, by that, special loan products are designed. Credit procedures like credit checks and affording capacity in BNPL are managed through AI, which acts as a definiendum in decision-making. It lifts consumers' confidence and disharmony due to proactivity in purchases at top convenience, equal to none with flexibility. The author Packin et al. (2022) present that AI for loans plays an automated role in risk management and efficiency in lending. AI knowledge has enriched financial institutions.

Gen AI will help in Personalized lending space. By understanding customer needs and preferences, generative AI can create personalized loan offers, increasing customer satisfaction and loyalty. AI can optimize interest rates (Dynamic Pricing) based on real-time market conditions and customer risk profiles. It will also bring in Operational efficiency especially in Loan document generation and automating processing. Gen AI can also monitor loan performance and identify potential risk, helping lenders to proactively manage their portfolio. In essence, generative AI has the potential to transform the lending industry by making it more efficient, accurate, and customer centric.

12. Impact of Generative AI on Fraud Detection

AI is beneficial for AI in executing fraud detection protocols that employ repetition, abnormality, and behavioural indicators to aid in fraud sweepings. Being able to continually re-use past patterns endowed with the power of efficient changes to the pattern of possible fraud, Gen AI optimises the searching procedures to keep the customer's assets safe and reduce any financial loss. Ahmadi (2023) and Sina (2023) have written that 'Transforming the fraud detection processes with OpenAI' is a focal point in their study. This portion of the paper highlights the role of financial institutions in promoting the ability to identify fraudulent activities, which is the main factor that makes them capable of thwarting them. Agencies were researched that apply open-source AI models by OpenAI for particular purposes, including figuring out that a large database of transaction cases might be suspicious. Moreover, during the summary in the Information Sciences field, Fiorenzo et al. (2019) foresee the GANs to be used in the process of credit card fraud detection to enhance the classifier effectiveness. They did not just directly intermit the connection of Generative AI. They at least disclosed the course and purpose of AI mechanisms in handling fraud and its aim for improved system performance. Generative AI is revolutionizing fraud detection with real-time anomaly identification, advanced pattern recognition, and continuous learning. These dynamic models significantly enhance accuracy while reducing false positives. As fraud tactics multiply and evolve, generative AI's self-learning capabilities create increasingly robust fraud prevention systems

13. Impact of Generative AI on Sustainability – ESG

AI's environmental sustainability objective is realised environmentally, socially, and governance-wise, and it covers the option for ESG investment. Gen AI exists coupled with ESG metrics that provide bases for investors and financial institutions whose decision outcomes should be modelled on sustainability objectives and to foster the creation of social and environmental impact. The article by Jain et al. (2023) identified the major challenge in ESG investing as complexity and the AI technology used to overcome it. This study's key contribution is in the field of such technology that can handle lots of data and identify patterns. Distinctively, these machine learning models can render meaningful conclusions and results in the context of green investment.

Also, the article's authors show that generative AI is a useful tool that strengthens the contributions of particular double-material-aligned enterprises for SMEs with an asset (Bova et al., 2021). It is evident that the system of generative Artificial Intelligence technology has been proven to be pragmatic, and so it could be adopted by sustainability assessment frameworks for the convenience

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of implementation; at the same time, the technology can be entered into the arsenal of such companies that are struggling to achieve ESG targets. The ESG evaluation and recommendation carried out by a generative AI with the tool can drastically reduce the already low workload and even make the ESG election process easier, thus leading to a better society and environment.

14. How Gen AI and Quantum Computing Can Work Together in Banking

Gen AI and quantum computing will create new ways of operating the banking industry by delivering a new generation of quicker and more productive data processing, optimisation and cryptography. Furthermore, quantum algorithms have addressed the issue of slow processing speeds in financial operations. They can solve the most complex analytical and computational issues like portfolio optimisation, risk mitigation, and fraud detection, and they do so in record time with higher accuracy levels. As reported by Bova et al. (2021) in EPJ Quantum Technology, an overhaul in the connection between commercial quantum-based applications and industries is being developed and eventually, the quantum age will come to the financial sector. The results obtained from this research would, in turn, build new approaches that leverage the platforms for optimisation and exploration by the banking and finance sectors.

Additionally, Mosteanu and Faccia (2021) discuss in the Journal of Open Innovation: We focused our discussion on the fintech horizons of quantum computing, fractals and financial blockchains against the background of the persisting paradigm shifts and the currently available infinite well-being potential that the financial market provides. Quantum computing as a universal technology is mentioned in this paper, showing its applications for fintech; however, it has gone further by examining the fact that the financial sector and banks have leveraged emerging technologies to create innovations in their operations.

15. Co-browsing relevancy for Financial Industry through Gen AI lens

AI-humanisation is to resort to the co-browser, which relies on contextual support and individualised recommendations in online interactions. The customers can carry out their shared projects with other banking representatives using the co-browsing integration feature of Gen AI applications, and the communication difficulties will be solved in time. Oney et al. (2018) present advancements in web accessibility by designing the shared browsing architecture. Although it is complicated to compare to the browsing context in online banking, they study its importance in the browsing verification of the collaborative environments and the possible technologies in improving user comprehension and usability of online interactions. Specifically, Arora and Kaur (2020) offer examples of banking system innovations and FinTech and also consider the application of smart Internet of Things (IoT) technologies at the 8th edition of the International Conference on Reliability, Infocom Technologies, and Optimisation. Despite IoT not being manifested in browsing uses for the moment, the principle does not change as the deeper study of the functions of the IoT reflects on the broader trend of incorporating advanced technologies into the systems to help improve customer experiences and simplify banking. The financial institutions will be an extraordinary booster for the co-browsing and support services and customer engagement.

16. Agentic AI

In the ever-evolving digital banking landscape, the demand for relevant, timely, and appropriate customer interactions is paramount. Traditional methods of customer engagement, which are often manual and time-consuming, struggle to meet these expectations. However, a new wave of artificial intelligence known as agentic AI is poised to revolutionize the way banks interact with their customers.

What is agentic AI?

Agentic AI, a subset of artificial general intelligence, empowers AI paradigms to automate tasks in the real world. Unlike traditional AI, which is reactive and specific, agentic AI is reactive and goal oriented. It can understand context, make decisions, and execute tasks independently, making it a powerful tool

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for automating complex tasks. Agentic AI, a cutting-edge technology that empowers AI models to automate decisions and actions, is prepared to transform consumer interactions by automating routine tasks and ensured compliance.

Customer Engagement Lens

Agent AI, unlike traditional AI paradigms that facilitate the processing and analysis of data, can initiate and execute autonomous actions This autonomy allows AI systems to make decisions based on predefined criteria, learn from interactions, and adapt to changing circumstances. For customer interactions, Agentic AI can automatically send personalised emails, in-app notifications, and push notifications tailored to individual customer preferences and actions.

A] Autonomous email campaigns: Agentic AI can analyze customer behavior, preferences, and spending habits to determine the best times to send targeted email campaigns such as, automatically triggering personalised tailored emails to customers who can default, Able to offer payment plans or financial advice about payment plans.

B] In-app information: By using agentic AI, banks can provide relevant in-app information promptly. For example, AI can analyze recent customer behavior and send information about possible fraudulent activity. Agentic AI can identify investment opportunities based on the risk profile of the client and accordingly, In-App reports can be sent to the client.

C] Push notifications: Agentic AI can customise push notification channels by considering factors such as device type, time of day, and customer preferences. This ensures that information is delivered at the right time, with right engaging message appearing on the screen of the device, so that notification is not missed by the user thus increasing its impact.

D] Legal Sales Considerations

While agentic AI offers tremendous potential, it is necessary to navigate regulatory and market challenges. Banks need to ensure that AI-powered transactions meet stringent compliance standards, such as GDPR and CCPA. Legal reviews of wordings in SMS, email, in-app, and push notifications, and marketing content can be checked by agentic AI making optimised legal process of approvals.

The future of customer interaction

Agent AI represents a major advance in the evolution of consumer interaction. By enabling AI to be leading-edge and autonomous, banks can deliver personalised, efficient, and effective communication. As technology continues to improve, we can see many new applications of agentic AI, which will affect the future of banking and the enhancement of user experience.

17. Conclusion

In conclusion, the widespread adoption of Generative AI (Gen AI) presents both opportunities and challenges for regulators, policymakers, and society.

a) Regulators can support Generative AI by establishing clear guidelines and frameworks that ensure ethical and responsible deployment. By collaborating with industry stakeholders, regulators can develop standards for data privacy, algorithmic transparency, and accountability to mitigate risks associated with Gen AI applications in the banking and financial sector. Additionally, regulators can foster innovation through sandboxes and pilot programs that enable experimentation with Gen AI technologies while ensuring compliance with regulatory requirements.

b) Innovation plays a pivotal role in assisting regulators and policymakers in navigating the complex landscape of Gen AI. In the past, Innovation Leader played key role in Product-based industry and under-played in service industry, however, in recent times service industry have pitched into the Innovation and, Research space. The role of Innovation leaders must be well-defined backed with budget and need to work with CTO and Executive community both in internal and external radius together. Innovation Leaders may help in creating awareness of new perspective and build understanding in

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adopting an easy-to-use AI EOU framework making Gen AI Application implementation easy and understandable. By embracing emerging technologies and collaborating with industry experts, regulators can leverage innovative solutions to address ethical considerations, such as algorithmic bias, data privacy, and cybersecurity. Moreover, innovation enables regulators to stay abreast of evolving trends and challenges in Gen AI, empowering them to develop agile regulatory frameworks that balance innovation with consumer protection and societal well-being.

c) Building the capability of Generative AI has the potential to ease everyone's day-to-day life by enhancing productivity, efficiency, and personalisation across various domains through Agentic AI. Gen AI streamlines customer onboarding, fraud detection, and financial analysis in the banking and financial industry, enabling financial institutions to deliver tailored solutions and services. Moreover, Gen AI empowers individuals by providing access to personalised financial advice, automated assistance, and innovative financial products, improving financial literacy and decision-making capabilities. In essence, the collaboration between regulators, policymakers, and innovators is essential to harnessing the transformative potential of Generative AI while safeguarding against potential risks. By fostering a culture of responsible innovation and collaboration, stakeholders can ensure that Gen AI catalyses positive societal impact, driving innovation, efficiency, and inclusivity in the banking and financial industry and beyond.

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