Generative Pre-trained Transformer (GPT) in AI/ML-Enabled Medtech Industry

Impact of GPT in AI/ML-Enabled MedTech Industry

Whitepaper by

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1. Executive Summary

Generative AI is a subset of artificial intelligence that can utilize existing data or content to generate new data or content. It has many applications in the MedTech industry, such as creating new medical images, designing new drugs and predicting patient outcomes.

This whitepaper discusses the role of Generative AI in the MedTech industry and highlights the following points:

- Generative AI's evolution, ChatGPT and subsequent versions
- MedTech sector and its need for the adoption of Generative AI
- Analysis of the advantages that GPT offers to the MedTech industry an its real-world applications

The whitepaper also identifies some key challenges and risks associated with Generative AI in the MedTech industry. The report recommends that healthcare organizations create an enterprise-wide strategy and integrate with the broader industry ecosystem to capitalize on Generative AI while mitigating its challenges.

The report concludes that Generative AI is a powerful technology that can transform the MedTech industry in various ways. However, it also entails some clear uncertainties and risks that need to be addressed carefully. Therefore, healthcare organizations should adopt a proactive approach to leverage Generative AI while ensuring ethical standards and best practices

2. Introduction

We have heard a lot about Generative AI and its potential to revolutionize healthcare, but what we have not realized is how quickly these tools are advancing in MedTech specifically. Artificial Intelligence (AI) has long held the potential to revolutionize the future, and this potential is becoming steadily more tangible through the recent advancement in Generative AI, with ChatGPT particularly capturing the attention of people around the world.

Generative AI is a part/section of artificial intelligence that can generate new content, such as text, images, video and music. So, rather than just analyzing data, Generative AI can also create new examples that are similar in style and form to the data it's been trained on.

However, despite its prospective benefits, implementing Generative AI in an organization and its applications is not without its own set of challenges. Organizations face hurdles in terms of data quality, employee training, ethical considerations and security measures, among others, when utilizing this technology.

3. Understanding Generative AI & GPT

As the name suggests, Generative AI generates images, music, speech, code, video or text, while it interprets and manipulates pre-existing data. Generative AI is not a new concept. It has developed on a foundation of Machine Learning techniques that have evolved over the past decade.

Large-scale trained neural network models, called foundation models, that can carry out a wide range of tasks including understanding and generating natural language, are crucial to Generative AI. These foundation models play a pivotal role in Natural Language Processing (NLP) as they are trained on datasets containing internet text allowing them to learn and understand language patterns. Generative Adversarial Networks (GANs), Variational Auto-Encoders (VAEs), transformer-based Large Language Models (LLMs) are a few among the various different types of foundation models.

At present, the two most widely used Generative AI models are:

- **Generative Adversarial Networks or GANs:** Technologies that can create visual and multimedia artifacts from both imagery and textual input data.
- **Transformer-based Models:** Technologies such as Generative Pre-trained (GPT) language models that can use information gathered on the internet to create textual content from website articles and press releases to whitepapers.

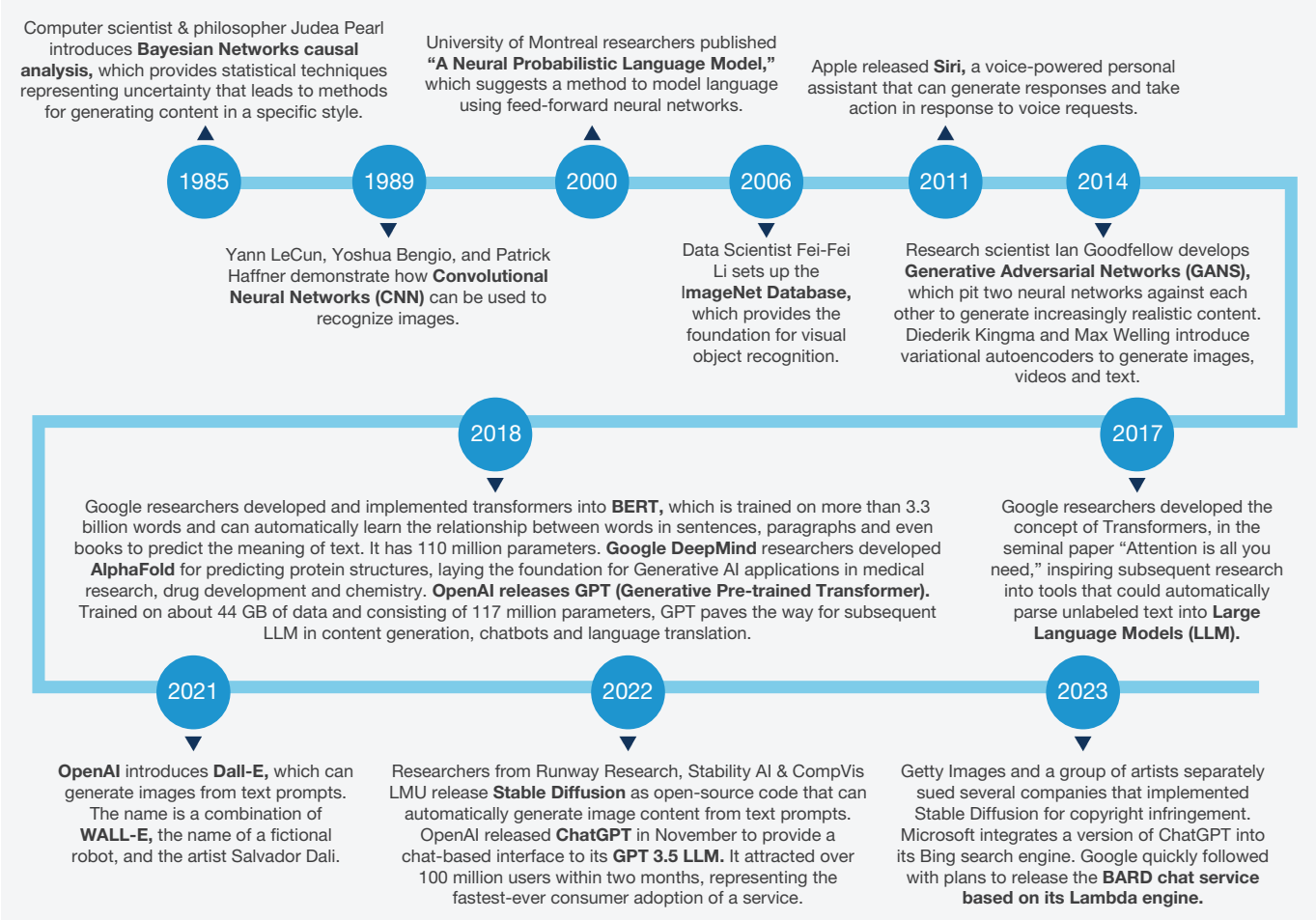
Large Language Models (LLMs) use transformers to perform Natural Language Processing (NLP) tasks like language translation, text classification, sentiment analysis, text generation and question-answering. LLMs are trained with a massive number of datasets from various sources. They are characterized by their immense size, with some of the most successful LLMs containing hundreds of billions of parameters.

Large Language Model Examples

ChatGPT buzz, a Generative AI chatbot launched by Open AI in 2022 drew attention to GPT – a large language model. Aside from GPT, there are other noteworthy large language models to take note of.

- **Generative Pre-trained Transformers (GPT):** Developed by OpenAI, GPT is one of the best-known large language models with multiple iterations, including GPT-3 and GPT-4. It can generate text, translate languages and provide informative answers to your questions.
- **Pathways Language Model (PaLM):** PaLM is a 540-billion parameter transformer-based LLM developed by Google AI. As of this writing, PaLM 2 LLM is currently being used for Google's latest version of Google Bard.
- **XLNet:** XLNet is an autoregressive transformer that combines the bidirectional capability of BERT and the autoregressive technology of Transformer-XL to improve the language modeling task. Developed by Google Brain and Carnegie Mellon University researchers in 2019, it can perform NLP tasks like sentiment analysis and language modeling.
- **BERT:** Bidirectional Encoder Representations from Transformers is a Deep Learning-based technique for NLP developed by Google Brain. BERT can be used to improve the accuracy of the Smart Reply feature and filter spam emails.
- **LLaMA:** Large Language Model Meta AI was publicly released in February 2023, with four model sizes: 7, 13, 33 and 65 billion parameters. Meta AI released LLaMA 2 in July 2023, available in three versions, including 7B, 13B and 70B parameters.
- All legacy java, spring-based application using older versions of the frame works — Java <= 8 , Spring Boot <
- Third party libraries typically used in enterprise application stack like utilities, persistence layer, caching and cloud plugins with dependency management and upgrade path.

Time-series of Iterative Frequent Events in Evolution of Generative AI Models.



Source: Redblink.com

4. MedTech Landscape: A Brief Overview

MedTech industry is extremely regulated and mostly relies on established products, technologies and processes. As is typical with any new technology, MedTech is known for its conservative approach towards those technologies due to its direct impact on human health. Generative AI is being approached in the same manner. However, with Generative AI's capabilities to transform processes, improve their efficiency, achieve unconventional creativity through process innovation, create value and personalized interaction with customers, its adoption is a must for every industry.

Since Generative AI has such a broad set of potential applications, the MedTech industry is now exploring new technologies and frameworks for countering threats and positively affecting their bottom line. Even the FDA has recognized many companies investing in artificial intelligence, which is expected to expand the use of Generative AI further.

A snapshot of a few industries that adopted AI/ML is as below: (Ref - FDA 2022).

Device	Company	Panel (Lead)
ABMD Software	HeartLung Corporation	Radiology
Deep Learning Image Reconstruction	GE Healthcare Japan Corporation	Radiology
cvi42 Auto Imaging Software Application	Circle Cardiovascular Imaging Inc.	Radiology
Swoop Portable MR Imaging System	Hyperfine, Inc.	Radiology
CLARUS	Carl Zeiss Meditec, Inc.	Ophthalmic
Viz SDH	Viz.ai, Inc.	Radiology
AI4CMR v1.0	AI4MedImaging Medical Solutions S.A.	Radiology
Vivid E80, Vivid E90, Vivid E95	GE Medical Systems Ultrasound and Primary Care Diagnostics	Radiology
EchoPAC Software Only, EchoPAC Plug-in	GE Medical Systems Ultrasound and Primary Care Diagnostics	Radiology
Libby Echo:Prio	Dyad Medical, Inc.	Radiology

5. GPT's Integration into MedTech

Recently, the Deputy PM of Britain emphasized that the recent impact of AI is projected to be more significant than that of the Industrial Revolution. At the same time, Geoffrey Hinton, a respected researcher at Google on AI, has emphasized that humans are no match for this technology. The apprehension around Generative AI is quite evident. A wait-and-see approach is quite evident among all to understand if this new technology would be a boon or a curse for us.

However, after the success of ChatGPT, we can clearly notice the transformations in healthcare. With the usage of AI, it's a paradigm shift imparting efficiency, accuracy and accessibility. The implication of GPT AI is so vast that we are unable to comprehend it at this moment. Prior to the success of Generative capabilities in AI, the most common use of AI/ML was to identify trends and hidden patterns (not easily distinguishable by humans). But after ChatGPT and its subsequent versions, the most highlighted feature of GPT AI is to generate new content from existing models, such as videos, texts, software codes, images, designing better alternatives. Governments and industries alike have started to use Generative AI to gain more detailed insights from their data and add more value to their analysis. In the MedTech industry, the primary advantages of Generative AI are:

- Improved efficiency through reduced human interaction and faster processing of data
- Highly personalized customer interaction with unconventional creativity, imparting more empathy while creating new data/content
- Reduction in design time and development cycle with fast application of DTI (Design, Thinking and Innovation)
- Strategic usage of data to generate more value and process information.

With the ability to generate new content with detailed precision, there is a substantial increase in value addition over the processed data. The foundational models are trained over huge datasets costing millions of dollars. The creation of a foundation model is a costly affair, and it requires expertise in the preparation of data, designing the appropriate architecture of data for the required output, training the model according to data and expected output and fine-tuning as required. MedTech companies must invest in these technologies and create local cloud models for more security and data privacy.

Therefore, MedTech companies must develop their own Generative AI to gain more market share from their competitors. The opportunity cost is too high to ignore. Companies need to build more significant use cases suited to their capabilities, harnessing the power of Generative AI to develop their goods and services. Multiple use cases in Operation, R&D, Sales & Marketing, Post-sales Customer Engagement and Corporate Collaborations are being explored in the MedTech industry. A few examples and use cases are as below:

A) Medical Research & Development

One of the most exciting aspects of R&D is in the field of discovery of new potential drugs and refining the formulae for clinical usage. AI-driven algorithms expedite the discovery time while saving time and resources. Sequencing of DNA nucleotides and amino acids is being done and new reactions are analyzed to shorten the new drug development time significantly. New drugs are created by analyzing the molecular models and predicting their properties, interactions, side effects and potential. It also helps to generate use cases for the use of existing medication for alternate diseases. This marriage of Generative AI and chemistry is a revolution for diseases that were once considered incurable.

Further, Generative AI can decipher complex medical images, helping radiologists to identify anomalies by recognizing patterns from the vast amount of data exposed to it. They help to detect diseases and make accurate prognoses even from uncorrelated human data. A simple eye scan with Google AI can clearly detect diabetic retinopathy in patients. This is further accelerated by Generative AI which helps to stretch beyond general software development.

Further, in the field of medical imaging, visual interpretation and diagnostics, Generative AI has created a breakthrough with extreme precision, early detection and accuracy. After reading millions of patient records from different modalities – like MRIs, CT scans, ultrasounds, blood reports, mammograms, etc., it can generate new extrapolated content to make accurate and critical diagnoses. Augmented with enhanced computational intelligence,

it helps the doctor with a detailed visualization by capturing even the tiniest of details and bringing them to the front. Thus, it minimizes the scope of incorrect diagnosis.

It also provides testing grounds for budding healthcare professionals by creating virtual test patients and simulating real-life scenarios. It helps to create educational models for training on varying cases of surgical simulations and virtual patients, thus providing a safe space to perform testing and make mistakes while learning without harming patients. The ability to replicate real patients with intricate anatomical precision and receive instant feedback about the virtual surgeries performed on them helps health professionals to enhance their skills, heighten expertise and confidence. Also, Generative AI can help write clinical or automated reports for regulatory submissions. These are tedious tasks with hundreds of pages. Also, they help to creatively decrease the time taken to Design, Think and Innovate (DTI) for formulating new products.

B) Software Development

Software development is also simplified with the generation of code snippets transforming natural language input into software codes, as trained over millions of lines of code. It helps to lower the initial development cost and fulfill the resource talent gap. It can also create automated code reviews (e.g., from Mintlify), documentation and creation of various test cases.

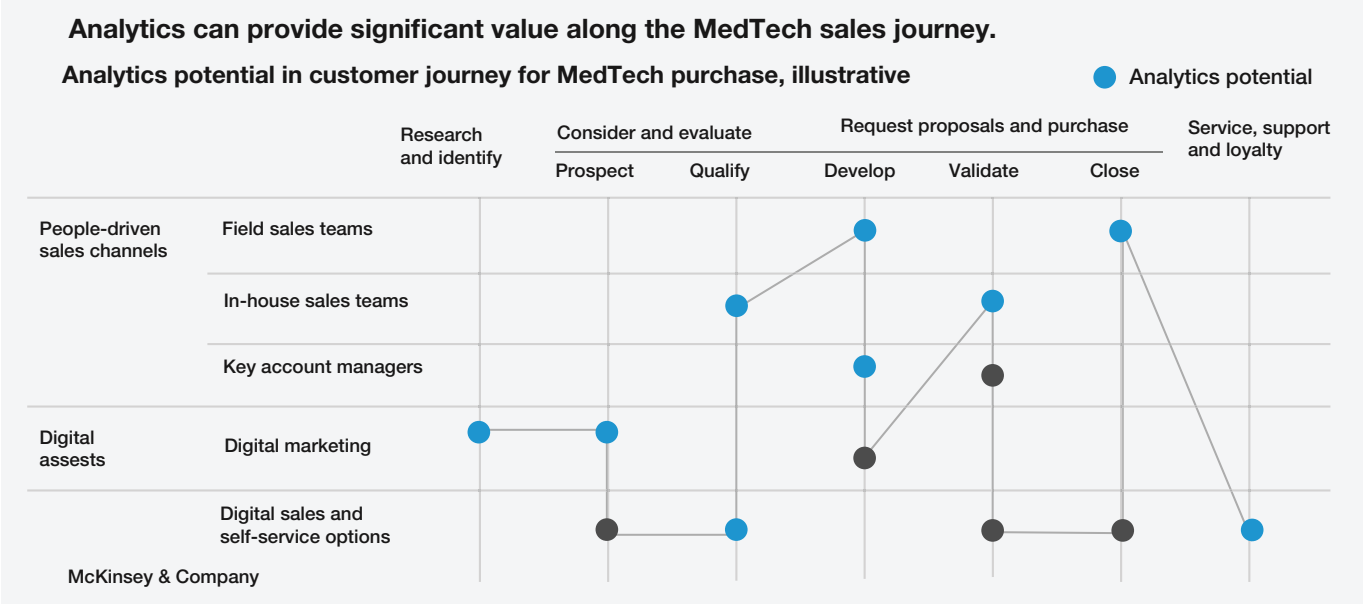
C) Sales & Marketing

With digital sales focusing more on personalized targeting of customers, many deal conversions are possible in the sales and marketing fields. Tailor-made messages and mass personalization based on customer history and past records will help to relate with potential clients more efficiently.

This would help enhance customer satisfaction and involve people more with the MedTech products. Customer data is no longer confined to databases maintained by companies. Generative AI can get the details from likes, comments on company webpages, media coverages, and CRM (Customer Relationship Management) tools to create customer-centric profiles with intricately detailed information. Also, they would keep track of a customer's response and help to formulate the next steps for subsequent visits. Examples of Generative AI working on this aspect are Salesforce's Einstein GPT, Microsoft's Viva Sales Copilot, etc.

There is a significant benefit for early adopters of Generative AI with almost doubling of customer funnel metrics. Significant increase in incremental revenue, conversion rate and higher lead generation suggests that investment in Generative AI technologies augments the current positions in sales and marketing; while delivering benefits across the entire CLV (Customer Lifecycle Value).

Below is a graph researched and analyzed by McKinsey that indicates how data analytics can deliver significant value at all levels of the Customer Lifecycle.



Source: McKinsey & Company (2022)

Face-to-face interaction is possible even with Generative AI, as it can exhibit human-like chat/ voice capabilities. It acts as a bridge between sales representatives working directly in the field, and the data scientists who help to analyze the data collected by the sales team. It helps to translate business needs into technical requirements, with Generative AI text/images to support the interactions.

This expands the domain of S&M to new heights as the end customer can have personalized conversations with Generative AI instead of a real human. It can enable customers to make informed decisions by generating texts and visual images to guide the customer with the correct information.

D) Operations

AI can detect problems where there is nothing apparently present. It can create extrapolated situations and prepare synthetic data to be used as training data for the new test datasets. This training dataset will help to extrapolate the situation virtually, generate various use cases and generate feedback and resolution reports. Hence, we would be better equipped to handle most situations before they arise. This will help optimize the supply chain and reduce production time by finding failures in prototypes faster, using sensors and computerized test situations. It can also predict risks more quickly during the initial part of the product designing and prototyping, along with suggesting corrective actions at each process step, saving valuable time and resources.

One of the examples is Google's EHR/EMR software which is working to create synthetic datasets that would help to identify the critical roadblocks in operations/supply-chain before they happen, trigger necessary alerts and send reports, and help to take action to mitigate risks.

Generative AI can further enhance procurement processes by simplifying access to the broad base of supplier data (i.e., from current contracts or proposals to public information on the supplier or industry). Through advanced natural language comprehension, algorithms can generate reports that contain summarized information as well as potential risks, and enable procurement teams to make better decisions.

E) Post-sales Customer Engagement

A far cry from customer support executives manually browsing through personal records, with Generative AI, 24x7 dedicated manual support is not required any longer. With the processing of customer details and Generative Pre-trained Transformer (GPT) technology of text generation from natural language processing, Generative AI can produce human-like interactions to address customer needs. Only a few cases will need human interaction, allowing for better resource management. Order management, delivery scheduling and interaction with customers can occur with real-time updates available for customers. Going beyond that, future solutions can use Generative AI to analyze customer and product usage data to determine whether customers are capitalizing on the full range of features or consistently hitting problem spots in a given process. Also, if some clients are underutilizing available resources, it can help reduce the problem spots found in the interactions, improving customer success.

Voice chats, chatbots and similar Generative AI products from companies like Zendesk, are helping reduce customer tickets and provide much-needed support with little human intervention. Using customer data and processing through millions of customer records, it can upsell or cross-sell multiple products to existing customers.

F) Corporate Collaborations

Generative AI will streamline the company resources available to employees and stakeholders. Any specific queries and advice related to company technology and capabilities usage can directly be responded to without human interactions. For example, if any client of Mphasis, while implementing any product solutions, wants to understand the capabilities of a specific software or wants to understand if Mphasis possesses the relevant expertise and success stories based on a similar framework, these queries can be directly answered by Generative AI along with examples and chat features. They can also highlight prior success cases in detail while maintaining data privacy.

Providing insights to businesses, based on data from scores of reports and analyses, and pinpointing actionable items with high accuracy is possible with Generative AI. It can also provide a map of which action plan would lead to what consequences, along with their probabilities.

Predicting the churn rate in a business and searching for resources, prior to the creation and timely fulfilment of such needs, would also help build synergy between companies. No projects would be hampered, and existing resources could be aligned to fulfill any resource gap. All this can be done without screening of resources or any manual intervention.

Similarly, like-minded companies like Mphasis and Kore.ai can collaborate, and areas of collaboration can be determined in the form of automated reports based on the strengths and limitations of each. This can be identified based on the available project data, and once higher synergy is achieved, the scope of interaction can be expanded to multiple projects to provide better customer satisfaction. Similar collaborations between MedTech Corporates as well as medical schools would help bring high-quality research to explore their business feasibility, on priority.This would benefit all concerned stakeholders and end customers.

6. Potential Benefits and Impacts

We discussed the integration of Generative AI into MedTech domain, lets further delve into the numerous advantages offered by this and its impact.

One of the most prominent benefits is in the field of documentation. Medical documentation is a cumbersome task requiring multiple filings and strict format. When done manually, it requires a lot of redundant manpower. Generative AI can assist in writing discharge notes, medical recordkeeping, tracking symptoms, diagnosis, treatment and clinical reports with live suggestions and auto-corrections. Virtual assistants and chatbots can help multiple patients get in-home services simultaneously. Remote support is especially beneficial for elderly patients, and those who have difficulty in movements. Remote Patient Monitoring can also be done through smartwatches, with sensors to provide real-time updates so, any emergency can easily be averted.

For increased interaction with patients, the upcoming Generative AI application can talk to patients and guide them on their medicine intake, remind them of any shortfalls and provide empathetic support in hours of need. It can highlight any potential side effects, allergy requirements and replan changes in dosage with automated discussion with the doctor. Also, the language barrier no longer exists with every language being supported by Generative AI. A doctor can prescribe medicines and suggestions in English while the patient might be a Spanish speaker, with Generative AI playing the role of a facilitator. Also, self-care is possible to some extent, reducing the burden on existing medical infrastructure.

Nowadays, there are talks of separate medicines for men and women, due to physiological differences in body type and hormonal differences. Similarly, care must be taken in the selection of individuals for clinical trials and deducing information. Generative AI can help to choose the appropriate mix of trial participants to get maximum benefits from one trial event. This targeted approach can help achieve higher throughput with different observations deduced from the same dataset of observations.

One of the unique benefits of Generative AI is the generation of artificial medical scans/images with the help of advanced algorithms. It helps medical practitioners by projecting various scenarios based on current patient data and historical references of similar patient profiles. This enhance interpretation by the use of synthetic data images. Furthermore, it also helps to create images based on real data to augment assessment by creating additional reference points which would help with the early detection of diseases. Even chances of future occurrences of diseases can be predicted with high probabilities. New drugs can be developed in a shorter period of time with prototype models being pre-checked by Generative AI.

7. Generative AI – Need of MedTech

Hence, we must understand the need for developing proprietary Generative AI models by MedTech companies. As we expect significant advancements based on various use cases discussed above, every company needs to identify specific use cases based on their own strengths, and their previous data storage capabilities. Based on that, they can either tie up with a Generative AI model-building company or build their own model as per their data. Based on this, they can create Gen AI solutions to increase their market. They can no longer wait for other competitors to build a model and adopt a wait-and-see approach, as the opportunity cost is very high. Let us study various use cases that highlight why it is important to invest in Generative AI to retain/enhance market share. The major examples are demand forecasting, discount management, price optimization, price leakage analysis, etc.

A project begins with customized sales quotations, which is currently being done manually with computerized tools to augment us. However, Generative AI can read multiple data sources, external news and media reports and create tailor-made quotations for customers, enhancing the efficiency of the whole process. This increases the ROI by creating personalized pricing, quotation and configuration, making Generative AI investment a strategic decision in current times. While human beings have limited capabilities to create insights from raw data collected by field representatives, Generative AI can quickly traverse millions of rows of data, secondary data, and other sources. It can generate insights where clear correlation is not visible between dependent and independent variables. These insights provide excellent recommendations for upselling and cross-selling of other products, leveraging customer persona, purchase histories and habits, and personalized terms and conditions to benefit sales and enhance CLV (Customer Lifetime Value).

We can also forecast upcoming volumes in diagnostics and testing to create curated offers for customers/groups and optimize pricing models to benefit our balance sheet with successful contracts. Thus, we can predict the threshold to make business more profitable, while increasing throughput for patient diagnostic testing, while improving margins and relative market share. With additional segmentation of customer profiles, we can develop better offers and reduce price leakage.

8. Ethical Considerations and Challenges

Though Generative AI has many applications and benefits for the MedTech industry, it also poses some ethical considerations and challenges that need to be addressed and resolved. Some of these ethical issues are:

- Privacy and Surveillance: Generative AI can collect and process large amounts of personal and sensitive data from patients, customers, and stakeholders. This can raise concerns about the protection and security of the data, as well as the consent and control of the data subjects.
- To start with, Generative AI can create realistic medical images from distorted or incomplete data, at the same time this may also expose the identity or crucial health-related information of the patients.
- Bias and Discrimination: Generative AI can reflect and amplify the biases and prejudices that exist in the data or the algorithms. This can result in unfair or inaccurate outcomes or decisions that affect the health and well-being of individuals or groups. For instance, Generative AI can design personalized treatments or therapies based on genetic, physiological, and environmental factors, however, this may also exclude or disadvantage some populations or minorities.
- Explicability and Accountability: Generative AI can produce complex and opaque outputs or decisions that may be difficult to understand or explain. This can undermine the trust and confidence of the users and beneficiaries of Generative AI, as well as increase the responsibility and liability of the developers and providers of Generative AI. Let's say, Generative AI can optimize the placement of components in semiconductor chips, but this may also introduce errors or vulnerabilities that are hard to detect or correct.
- Human Autonomy and Dignity: Generative AI can influence or replace human judgment or agency in various aspects of healthcare. This can affect the autonomy and dignity of the patients, customers, and stakeholders who interact with Generative AI, as well as the values and norms of the society that uses Generative AI.

These are some of the reasons why maintaining a balance between technological advancements of Generative AI and ethical considerations in MedTech is important. By doing so, we can ensure that Generative AI is used in a responsible and beneficial way for the MedTech industry.

9. The Road Ahead

The path ahead is full of opportunities. While making a detailed study of the MedTech industry, we identified huge opportunities in the present and the near future. Until a few years ago, companies like Carl Zeiss Meditech were maintaining hard copy documentation of DHR (Digital Health Records) and Work Instructions. It was proving to be a cumbersome process for reference, as well as a legal hurdle. Implementation of digital documentation through SAP has streamlined the process and opened the gates for implementation of AI technologies. With recent developments in Generative AI, we can extract customer insights from the same, create models by extrapolating data without repetition, and increase throughput. Apart from documentation, digital manufacturing process implementation has allowed users to analyze processes and integrate them towards resource-efficient systems. This has helped to decrease the production time significantly, with value addition at each step of the process.

Similarly, MedTech companies are building Medical Ecosystems that support data collection, processing capabilities, application management and medical devices. The synergy between these Medical Ecosystems can benefit from Generative AI to make evidence-based decisions and provide a single point of service delivery optimized for the best results.

10. MedTech-specific Models & Use Cases

Here are some of the MedTech-specific Generative AI Models:

A) **Med-PaLM:** Med-PaLM is based on a large language model (LLM) designed to provide high-quality answers to medical questions. Med-PaLM harnesses the power of Google's large language models that are aligned to the medical domain and evaluated using medical exams, medical research, and consumer queries.

B) BioBERT: BioBERT is a biomedical language representation model designed for biomedical text mining tasks such as biomedical named entity recognition, relation extraction, question answering, etc.

C) ClinicalBERT: Clinicalbert is trained on clinical notes/Electronic Health Records (EHR). It uncovers high-quality relationships between medical concepts, as judged by physicians.

Hippocratic AI revolutionizes medical education with cutting-edge AI-patient simulation models. Its virtual patients think, act, and respond just like real people, letting healthcare professionals practice patient interviews in a safe, realistic environment.

Recently, **Paige.Ai** has been using Generative AI for early cancer detection and providing a new horizon in pathology. It has recently tied up with various educational institutions to increase its field of study in prostate cancer detection. Being a pathology technology company, it is studying early markers of the disease which will help to provide faster support to patients. Also, it uses Multiple Instance Learning (MIL) for training over extremely large datasets with minimal supervision. This will help in breast cancer detection and overcoming classification subjectivity.

It can enhance, highlight, and improve the accuracy of diagnostics done using Carl Zeiss Surgical Microscopes. These diagnostic results can be matched across multiple patient profiles and based on millions of prior customer records; future predictions can be made by studying the diagnostics as well as the bio-vitals of the patient. Hence, it can predict problems in other areas of the body (with some accuracy) by matching records as per the trained dataset.

11. Key Recommendations

Some organizations may adopt a wait-and-see approach to measure the impact of adoption and its opportunity cost. Such a strategy may risk putting companies at a long-term disadvantage. That's why MedTech companies should begin to implement the technology in various parts of their business to remain competitive & stay relevant.

Based on that they could follow these recommendations:

- Firstly, MedTech companies should identify their key target areas based on the different use cases discussed above. To identify the use cases that have maximum benefits, they should create a cross-functional team consisting of data scientists, legal experts, and functional business leaders. This team should suggest numerous ways to either create a new model, invest in an existing one or wait for Generative AI technology to further evolve. Based on their recommendations, different areas should be identified for improvement within the organization.
- Based on the internal recommendations from their teams and use cases identified, they should explore options for different tie-ups with potential industry partners, with whom they have common goals. As this is an expensive technology, a collaborative effort would provide a more inclusive and cost-efficient analysis. There is no one-size-fits-all model or use cases. Every MedTech company must identify its own strengths and ROI. Based on that, they should prioritize which use case to pursue.
- As per the above discussion on privacy and ethical considerations of Gen AI, Responsible AI practices and principles should be followed. Although there are very few guidelines available for this technology, big MedTech companies should lead the way. They should educate and train developers, commercial and individual users, etc. about the different ways to responsibly use this technology. Also, it should contain scope to add citations to identify which user/company has provided this input to affix limited liability. Also, IPR (Intellectual Property Rights) should be honored, and Generative AI models should take care of this.
- Additional efforts should be made to verify the accuracy of these models. As these directly affect human life, proper testing should be done. Also, there should be scope for error handling so that inconclusive results can be shown properly, instead of making bad recommendations. Generative AI models lack the concepts of confidence when responding to chat queries. So additional accuracy checks are needed.

12. Conclusion

Gen AI is a powerful technology that can transform the MedTech industry. It can improve the quality and efficiency of diagnosis and treatment, accelerate the innovation and development of new drugs and therapies, and enhance customer experience and satisfaction. Generative AI holds the potential to dramatically increase efficiency, improve the quality of care, and create value for healthcare organizations. However, it also entails some clear uncertainties and risks, such as biased outputs, false results, abuse of patient privacy, and over-reliance among patients on AI-generated guidance. Therefore, healthcare organizations should create an enterprise-wide strategy, build data systems, invest in capabilities, forge strategic partnerships, and integrate with the broader industry ecosystem to capitalize on Gen AI while mitigating its challenges.

13. References

https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-aiGenerative AI: What Is It, Tools, Models, Applications and Use Cases (gartner.com)

https://www.tatacapital.com/blog/generic/what-is-chat-gpt-and-how-one-can-use-it/#:~:text=ChatGPT%2C%20or%20Chat%20Generative%20Pre,was%20used%20to%20train%20ChatGPT.

https://bernardmarr.com/a-simple-guide-to-the-history-of-generative-ai/

The ethical issues of the application of artificial intelligence in healthcare: a systematic scoping review | AI and Ethics (springer.com)

Ethics of generative AI (bmj.com)

https://www.genpact.com/insight/from-data-to-dollars-generative-ai-in-medtech

https://www.zeiss.com/corporate/en/about-zeiss/future/research-and-technology/digitalization-insights/artificial-intelligence.html

https://www.gartner.com/en/topics/generative-ai

https://towardsdatascience.com/what-the-heck-are-vae-gans-17b86023588a

https://www.bcg.com/publications/2023/how-generative-ai-is-transforming-health-care-sooner-than-expected

https://redblink.com/generative-ai-models/#Transformer-Based Model

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