

# **FOUNDATION OF DIGITAL BUSINESS**

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**Lecture 06**

## **Lecture 28 : Gen AI Impacting various business Operations**

Good morning. So, my second lecture on this module of module number 8 generative AI the next productivity frontier. So, I will be talking about impacting various business operations like how generative AI is impacting various operations. So, I will briefly touch upon three key professional areas are majorly impacted by generative AI. which will give you an idea which of the areas have to give priority to for finding out AI initiatives and some sector wise impact of Gen-AI.

So, you will get an overall perspective how various aspects of industry, various functions of various departments of industry where is getting likely to get impacted by Gen-AI application. So, it serves both the purpose you say which area you can start easily for your you know it will succeed because people are already using in those areas. So, most likely these projects should not fail because people are getting positive experience. So, the professional areas one of them is to start with is content creation and media that was obvious one for gen AI because they are summarizing, creating content etcetera we have been talking about that.

So, professions like writers, journalists, graphic designers, video editors and musicians are already seeing the impact of gen AI. So, automation of routine tasks can generate drafts of articles, create images and videos from text forms, compose basic musical pieces. and even generate marketing copy. So, this can free up professionals to focus on more complex creative and strategic aspects of the work, this is the other way of looking at things. So, we have for everything we look at from you know both sides.

So, some people will lose the work, there is a job they will not do. We can see it the other way: you are getting freed from doing the simpler, repetitive things, etcetera. So, with that free time, you can do better things—more complicated things or different tasks, etcetera. So, take everything from a positive perspective. Augmented creativity.

Artists and designers are using JNI as a tool for inspiration, rapid prototyping, and exploring new stylistic avenues. For example, designers can quickly generate multiple variations of a design concept. So, you have a concept; now you can have different images, then decide which one is better, etcetera. So, you can work with the different ideas that can be created.

So, you are augmenting your means—you are increasing, strengthening your output, adding to it. Augmenting means you are adding something more. So, I start with this, but then can I quickly add more variants so that I can get a better overall perspective? Personalization at scale: marketers can use a gen AI tool to create highly personalized content for different audience segments, enhancing engagement. So, different segments have different wants or requirements.

So, can I create content addressing their particular needs and content? So, you can use these tools very much to ask the Gen I tool Gen I please create this content for school students or please create this content for suitable for attractive for say housewives. So, you identify different cohorts and you can then modify your pitch or your content or add component marketing according to that likes and dislikes of that particular cohort and the JNI tools can very easily do these things. Now what are the challenges?

The concerns are existing around the copyrights originality and spread of misinformation defects and the potential devaluation of human creativity if not managed ethically. So, all these questions keep coming up because when chat GPT or these tools open LLMs have been trained on various input data sources. Now you are using that for your output. So, somebody can question the copyright aspect for example. or is it comes under plagiarism.

Somebody has written a research article and I am using that material to produce another That is plagiarism that are using somebody else's creation without their permission copying it and using same can be extended for art artistic creation etcetera. So, can I use somebody else's creation to create something similar or whatever. So, those are the ethics questions which are cropping up very much nowadays because many people are now questioning this can the tool use whatever data and then produce something for

somebody else. So, there is a potential devaluation of human creativity, because I am copying somebody has created and I am using that.

So, where is the overall creativity is getting a hit, now everybody can become an artist or everybody can become a poet. So, you are democratizing the whole business of creativity. So, then everybody can write a Nobel and claim for say Nobel Prize for example, just to take things to bit too far. But this is what is the problem that you have to think about it. The technology is becoming so powerful, but you can practically literally do anything.

If they take up professional again legal to the lawyers, they have extensive application for these tools. Legal research can quickly fit shift through huge amount of there to study volumes and you go to a lawyers chamber you see huge bound volumes of previous cases etcetera and who has the all the time to go through that. So, nowadays everything is digitalized. So, things are available online for example, of the orders cases etcetera in most countries including India.

So, now you can shift through all those online. So, now since it is digital case law and then you can extract whatever information you need and you can find out what are the relevant precedents and information. The tool can summarize it for you, the tool will tell you these are the important insights. So, they are building in intelligence with that tool will tell you these are the important insights please make a note. So, tool is actually literally doing the research for you so to say.

Document review and analysis can assist in reviewing the contracts, identifying clauses and summarizing legal documents significantly reducing manual effort. Drafting legal documents, here I can help generate initial drafts of legal briefs, motions and contracts which lawyers can then refine. So, I can give prompts please draft a letter such and such people expressing this, it writes a letter, draft is written and then you can just edit. So, what would have taken half an hour is done in 2 minutes.

Predictive analytics generally assist in analyzing the case data to predict potential outcomes or identify litigation risk, what can could be potential litigation risk. Ethical considerations, ensuring accuracy, avoiding bias and maintaining client confidentiality are the critical challenges. So, this is the other side of the challenges, how do I ensure accuracy, how do I avoid bias and maintaining client confidentiality because that is very important thing for in the legal domain. Finance and accounting fraud detection and risk

management algorithmic trading automation of accounting tasks. So, various financial activities can be done by this.

In education and research, generic tools are emerging that can change teaching learning research methodology that is what we are directly expressing day in and day out today. The challenge is ensuring academic integrity preventing over reliance on the tools and addressing the digital divide are important considerations. Digital divide is different with haves and have nots like for example, in the school level young primary school or secondary etcetera it have to be faced that problem during the COVID time when everything went online. The all schools are now going online. If you take the schools where the lower economic state of their children are going the lower income groups.

Now, do you expect them to all of them to have smart phone for example, but those days were not possible to attend classes without having a smart phone or a net connection. So, we have to think from that perspective also what about that state of the rural people, the villagers or the low income groups to same that digital that is called the digital divide. I can today afford to buy a laptop, a phone, smart phone or a tab or etcetera, but can everybody do that. So, that is a divide which we have to take into consideration. So, when I am educating people showing education, education is supposed to be for all whether you are rich male or poor does not matter.

And the other challenge in the educational research we are facing is about this whatever we give assignment etcetera anything can be produced project reports can be produced through the JINI tools. So, how do I find out whether it is been created done by the student themselves or they have used the tool it is very difficult. In healthcare, drug discovery and development, medical imaging analysis, personalized medicine, medical documentation, administrative task, synthetic data generation for trials etcetera. So, all of these things GenAI is doing a lot of contribution. However, medical imaging analysis I have been referring to this case of cancer detection using AI, what are the risk factors, what is the level of accuracy we need etcetera.

So, those things are still work in progress I mean it is very not yet difficult, but Drug discovery and development, I will give you an example later, how tools can be used to speed up the entire drug discovery and development process and it is happening today. Software development and IT, code generation and assistance, programmers I mean it is almost becoming a no code regime or a low code regime, you must have heard about this term low code, no code. So, you can actually literally talk to the computer, give an

instruction and your code It has come to almost that state and most of these codes could be 90 percent correct or you need little bit of tuning etcetera.

Sometimes it could be simple codes could be 100 percent correct. So, you did not many cases you do not today do not need a programmer at all. So, any person can just give the instructions and that too you do not maybe have to type, you just be verbally speak computer understands and can do the job. Now, the other most important area of course, is customer service. This is where normally most companies they like to start their AI journey.

Advanced chatbots and virtual assistant, this is the quick hanging fruit. So, anybody anything customer service try to bring in an automated tool chatbot. So, that I do not have to keep employee people 24 by 7, 3 shifts etcetera to give answers to respond to queries from the user. So, all of us are from using it also we are booking travel sites. So, any sites we open up the chatbot comes up do can I help you and what do you need and things like that, hi I am this and that and we are definitely using it.

Personalized customer interactions, AI can analyze the customer data to provide tailored responses and recommendations. And automated summarization analysis, this is the same thing extending from the other applications summarizing whatever inputs the mails have come and things like that feedbacks. The agent augmentation, human agents can be assisted by AI with real time information response suggestions and task automation. So, allowing them to handle more complex and empathetic. So, end of the day when you are interacting with a customer for example, and you have a tool on your with your in your phone or whatever it is at there.

And you can prompt given query and then it can give you lot of information which will actually augmenting your interaction with the customer. So, getting advanced information real time information which you can then tell the customer whatever he or she wants to know. Customer sales again continue with customer operations, customer sales service interactions that is the same thing is mostly using a tool based thing where you can call it as a DYI. So, do it yourself. So, nowadays this DYI culture is coming in various places including if you go to an airport you want to check in the check in counters are also become DYI.

So, you have to just put in your PNR and your name and then the whole your boarding pass comes out even your baggage lock etcetera everything comes out you can put that thing and then take it to the counter. reducing the workload of the employee the airlines

employee and doing most some of the work yourself with the help of a tool. So, it can deliver immediate personalized responses to complex inquiries. Resolutions during initial contact, reduced response time and increased sales are the advantages of such tools.

So, first contact first approach itself it gets resolved because you are now using a smart tool to respond to answer, response time is faster and it can result in increased sales. So, these are the immediate benefits of such self-service tools and models. Customer agent interactions, you can use the AI developed call scripts and receives real time assistance and suggestions for responses during phone conversations for example. Instantly accessing relevant customer data for tailored and real time information delivery. And agent self-improvement, agents can use automated personalized insights generated by the AI including tailored follow up message or personalized coaching suggestions.

So, three things it is generating an insight for the human agent, the customer for the sales engineer let us say. Then it is including also tailored follow up message, what should be the response, what should be the mail or what should be the WhatsApp message or whatever or a personalized coaching suggestions. So, you can get three benefits from the tool on your sales role. how marketing and sales could be transformed. Now, we will get into this functional areas and you will see there is lot of areas in marketing where if we can double people are using it.

So, that is why we are referring to this and mentioning this and which can be used. So, that is the quick win type of thing the marketing is the one area which should be first mark and customer etcetera customer service. So, customer and marketing they are linked. So, that is why you are talking about this and we will next few slides I will take you through how marketing and sales could be transformed using such generative gen AI tools. Gather market trends and customer information from unstructured sources again multimodal social media news research

whatever product information customer feedback and you draft effective marketing and sales communications. So, ultimately one of your aim is to draft an effective marketing and sales communication. Awareness customer sees campaigns tailored to their segment language and demographics. So, you can go to customers of different regions specially country like India where you have multiple region multiple language etcetera and you can make very language specific campaigns segment specific and demographic specifics.

So, you can narrow it down to particular region, particular language they speak only that language it is whether it is a rural, urban, semi urban, semi rural whatever type of

population their education level etcetera. So, with that you can do lot of segmentation and then tune or change the campaign according to that segmentation by the tool. So, the tool does it all for you. Consideration customers can access comprehensive information, comparisons and dynamic recommendations such as personal try ons.

So, you are as a customer searching for some product may be a dress or whatever etcetera. So, you get lot of information like you can get comparisons between different products suggestions recommended dynamic recommendation and you can also now digitally try on. So, as you can see your picture you take your picture and your video picture you will see a video of yourself you know trying the dress wearing it and maybe you can turn different sides and see how it looks on you from back side front side side etcetera different size angles etcetera.

So, this helps to give you additional information for you to take make the decision of whether to buy the dress or not. Conversion, virtual sales representatives enabled by gen AI, they emulate human like qualities such as empathy, personalized communication and natural language processing to build trust and rapport with customers. So, you can influence customers with the help of the tool, because the tool almost behaves like a human being. So, it can express empathy and you can understand the empathy, understand the customers problem, give personalized communication.

cater towards for that individual customer and with help of language natural of course, language processing with all this you try help to build a trust and rapport with your customer. So, you can or potential customers. So, that is conversions you can convert a individual to a actual customer who does a transaction or buy something from you. So, one is conversion the first getting the conversion, now retention the customer more likely to be retained with customized messages rewards and they can interact with AI powered customer support chatbots.

So, that is 24 by 7 and it helps to manage the relationships very proactively. So, that will reduce your churn effect, so the chances of losing customers will get drastically reduced if you are using all this technology to improve the interaction of the customer with your organization. Hold rapidly marketing and sales functions in which text based communication and personalization at scale are driving forces. The technology can create personalized message tailored to individual customers.

their interest, their preferences, their behaviors etcetera as well as do tasks such as producing first draft of a brand advertising, headlines, slogans, social media posts and

product descriptions. So, much of all these creative work can be handled by the tool itself and it can be generated in a very short time. So, what are the points of concern? Everything cannot be good, there could be something negative also. The model strain on publicly available data without sufficient safeguards

against plagiarism, copyright violation and branding recognition which I was talking earlier, risks infringing on intellectual property rights. This happens very frequently in the marketing domain. Because if you have an ad campaign from somebody and then it picks up something from that few words few phrases or whatever and then that company able to detect those when your ad campaign So, they can raise serious concerns with you that you are plagiarizing their campaign. Significant human oversight is required for conceptual and strategic thinking specific to each company needs to avoid this pitfall on account of this biased training data.

So, that is where the human being factor comes in the oversight, the responsible AI the ethics So, I have to first oversee all the training data the quality of the training data what inputs are being used to give the training and then we should also check the output product and ensure that it is not using any plagiarized content or violating any copyright regulation. It is very important to take a look before you release it. So, most of the work is done. So, you save time on that, but then you spend some time on doing this quality check very important quality check.

Potential operational benefits from using GenAI for marketing will include the following like enhanced use of data could help marketing functions overcome the challenge of unstructured, inconsistent and disconnected data from different databases. Plethora of data is not the problem, the problem is how to collect them, use them and make some sense out of them. The challenge of unstructured, inconsistent and disconnected data from different sources By interpreting abstract data sources as text, image and varying structures, multimodal inputs can be processed by JNL.

So, a text can be a person writes a text, grammatical error, spelling mistakes, so many things can be there. And everybody will write the same thing in a different way, because your level of English or whatever varies from person to person. Similarly, it is true for image, images can be the photos can be for many things. So, all of these different type of inputs can be processed by GenAI tool much better probably than what a human being can do. Such tools could identify and synthesize trends, key drivers and market and product opportunities.

from these unstructured data such as social media, news, academic research and customer feedback or whatever. So, it can come up with trends, come up with what are the key drivers and the market and product opportunities. So, this is what we want as a sales people this is exactly what I want and this is what GenAI tool will give you. Product discovery and search personalization. The product discovery and search can be personalized with multimodal inputs from text, image, speech and deep understanding of the customer profile.

This I have already discussed sometime back. Technology can leverage the individual user preference behavior and purchase history to help the customers discover the most relevant products and generate personalized product description. So, this is what the sales guy needs to do. So, can I give the customer more relevant product and generate more personalized

product description for a customer based on their history of user preferences, the behavior and whatever purchase they have done earlier. This allows say CPG consumer goods industry or the travel and the retail companies to improve their e-commerce sales by achieving higher website conversion rates. So, when you want to travel somewhere we often go to this tripadvisor.com sites and find out their recommendation about various sites, various hotels, resorts, etcetera. And based on that we that helps us to take And, how do they get those their recommendations?

Their recommendations comes from feedback previous feedback. So, people are giving visiting places and giving feedback posting pictures giving feedbacks etcetera. So, trip advisor insists on getting feedbacks from you. So, based on the feedback analyzing that their GPT tool will then come up with their suggested recommendation which the future traveller can now use to take decision. How product R&D could be transferred?

Now after marketing, now we come to the research. Researchers use generative AI to enhance marketing, market reporting, ideation and product or solution drafting. So, from based on this customer's feedback, based on the analysis, researchers can predict using these tools what the customer wants. So, that can leads to ideations can we give that it could be a new product or it could be a new solution or a new service. So, this is the beginning of the research beginning of the development.

So, I am trying to capture what a customer need is. So, that is all the marketing is basically is about capturing the need of a customer group, society, cohort whatever etcetera and then after that only then the product development starts. to satisfy that need.

The virtual design is another aspect where researchers use GenAI to generate prompt based drafts and designs allowing them to iterate quickly with more design options. Obviously, you are speeding up things with these tools because whatever prompts you give

it comes up with the design then you can change the prompt you can fine tune go on fine tuning the model or you can change the prompt that is prompt engineering. So, that is also another skill nowadays we are being developed and the sought after prompt engineering because the output will depend on the input right. So, giving a prompt is not really that straight forward or easy because whatever you are saying writing it you may not get the desired result. So, you have to keep changing tweaking the prompt to get what you want. Virtual simulations researchers are accelerating and optimizing the virtual simulation phase if combined with new deep learning generative design techniques.

So, if you look at this picture here the virtual simulation of a car automobile or here maybe and the designers through digital techniques through VR techniques virtual reality etcetera. or other techniques, they can see various features of this car from various angle, dimensions, performance. This could be a digital twin for that matter, it could be a replica of a physical car, but if I give some parameters here inputs and see how that car is performing or behaving. So, with that I can go on testing the car in various with various inputs and test for its performance and behavior both. And so, whichever parameter it shows that it is doing the best performance or the best behavior I can use that for my actual physical car.

design put it in the design. So, that will get manufactured according to those variables and parameters. So, this is a very economical way and quick way of designing a car and testing all the parameters. I can do it online here without actually taking a car doing a test drive which also has to be done later on once a car is ready, but this thing can be done completely

90 percent or so more of the testing part can be completed here on a virtual digital mode. So, it will saves lot of time and money. Now this is finally, a story quick story about 2024 Nobel Prize in chemistry and physics. So, this one is about chemistry where the protein structures where there is an AI model was developed to find out protein structure, analyzing a protein for the structure is was a very time taking process.

It used to take several months or maybe years to analyze a single protein. Now, with this deep artificial neural network model was developed and one of them the one of the Nobel

Prize winner this time incidentally like Demis Hassabis is not a chemistry person, he is an AI person. So, just imagine an AI person AI computer science person gets a Nobel Prize in chemistry, something which has never happened before. All Nobel Prize in chemistry were won by chemist, by physics, by physicist etcetera.

Now, why it was given? The reason is that they could successfully solve a problem that chemists wrestle with for over 50 years predicting the three-dimensional structure of a protein from a sequence of amino acids. This allowed them to predict the structure of almost 200 million known proteins. So, almost all the known proteins in the animal world including humans animal etcetera has now been analyzed thanks to this AI artificial neural network model. So, now you can analyze a protein within minutes or hours not years.

So, just imagine the improvement in productivity, no wonder he was given the Nobel prize in chemistry. The predicted structure virtually all the 200 million. Google deep mind which developed this program called alpha fold 2 it has made it publicly available it has made it open source which is not like you have to pay money to get this. So, anybody can use it and because it has been made open source now it was like that chat DVD. So, everybody is using it and all chemists are using it who are interested in protein structure and that is how they had could well to do analyze all the 200 billion protein structures.

Because if they had copyrighted that and only selected people paying money can use that then the output also would have been much much less, but once you make it open source anybody can any chemist can use it and they can go on cracking the protein structures. So, it often took years to obtain a protein structure if at all now it can be done in minutes. The AI model is not perfect, but it estimates the correctness of the structure it has produced. So, research has know how reliable the prediction is.

So, the ability to create proteins that are loaded with new functions is just as astounding. So, now you can create new protein structures. So, you can create now new nanomaterials, you can target pharmaceuticals, create drugs, design drugs and create drugs, designing will be done by this open AI chat GPT, the gen AI tool. More rapid development of vaccines, minimal sensors and a greener chemical industry. Vaccines we know COVID-19 was developed in 11 months.

Normally vaccines take multiple years minimum 6-7 years almost 10 years for many most of the cases, but now we are developing vaccines in months the RNA types. In

physics same thing happened Geoffrey Hinton was working in Google the computer scientist known as the father of AI. was given a Nobel Prize in physics computer science. Why? Because he developed the basic fundamentals of ANN artificial neural network tool based on theory of physics.

So, sorting and analysis of vast amount of data which is being done by these ANN tools, he used physics laws, laws of physics to construct this tool. which helped lay the foundation of today's most powerful machine learning technique. So, based on this artificial neural data is currently revolutionizing science engineering and daily life as I talked gave the example about the chemist Nobel Prize. So, the basic tool that ANN he had used lot of laws of physics. So, he worked with physicists to develop this tool and he was also given a Nobel Prize in physics.

So, roughly, this is just to summarize the whole thing—the AI universe—how, you know, to look at it. So, this is your AI artificial intelligence, then you have machine learning, then you have your neural network, deep learning and finally, we are now using generative which leverages deep learning and neural networks to produce all the outputs we have just been talking about and how this tool is going to become. So ubiquitous that almost everybody—from schoolchildren to college students to professionals in any field. including movie makers, artists, authors, writers, script writers and of course, scientists, chemists, physicists and of course, business professionals,

human resources—everybody will be using this tool, and most have already started. The use will only continue to increase. With that, I will end today's lecture. Thank you very much.