FOUNDATION OF DIGITAL BUSINESS

Surojit Mookherjee

Vinod Gupta School of Management

Indian Institute of Technology Kharagpur

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Lecture 26

Lecture 26 : Find AI opportunities – Part 2

Good morning. So, continuing on my module 7, which was about artificial intelligence for business now and beyond. So, this is my last topic in this module, which is finding AI opportunities. I will continue where I left off in my previous class. So, there also, I was discussing how to find AI opportunities. So, I will continue and finish that topic and then take you through some AI initiatives which are being used by organizations.

So, this will give you an idea of what type of initiatives you should look for and which ones other organizations are working with. So, they should also work for you. So, they should also work for you and the AI canvas is a small tool which I will AI solution at a very high level. The details of this tool can be found in the books. So, continuing on how to find AI opportunities—the first step was to identify potential AI initiatives.

So, one of the method the third method was internal crowdsourcing where means you are asking a group of subject matter experts and people you know and trust and who are working in the organization and are associated with that problem and they know various aspects of the problem to complete a labeling because you know supervised learning first thing you need to do is label your data because you have to because that is for your training data because the computer as we told If you see this, then this is the answer. If you see this image, this is the answer. If you see this particular text, this is what it means, etc.

So, you have to keep labeling every data input that you are giving to the deep learning model, the supervised learning model. To build a sentiment classification, for example, you could ask your colleagues to label phrases— A prompt customer service and a

flawed design as containing a positive or negative sentiment. So, you are doing sentiment analysis—developing a tool for sentiment analysis. So, if this is the response from a customer that we require we got a prompt customer service.

So, that is a positive feedback and if they mention a flawed design that is a negative sentiment. So, specifically generate label data to develop this tool. So, the online platform such as light tag and many others can be used to collect labels from your SME. So, you can use this tool for and give it to your SME to work on it and to do the labeling task, it is a purely manual job. And the other option is choice is to go for external crowdsource.

So, when you do internal and when you do external. Internal I have already explained you need to people need to know the topic, the subject, the problem and the business also so that they can come up with the correct levels. External crowdsourcing you can do when it is about you pay unknown human workers you do not know because it is a crowd you do not know the people to generate some data for your labeling data for your project. they can be anywhere.

So, it is clouded in your country outside country somewhere low cost countries, they work heavily many African countries etcetera many people are working doing this job for Amazon and other Google and other big employers. So, Amazon there is a tool Amazon Mechanical Turk, it is an online platform that allows you to outsource this labeling tasks to workers around the world. to generate data for machine learning projects quickly. So, you have to use so that they log into this tool do the job and you also have to monitor the job and the progress, but these are very labour oriented job tasks.

So, you have to give them very definite goals per day. So, every day in 8 hours shift probably you have to level maybe 1000 data. I do not know the exact numbers, but just telling you that. So, this 1000 data points and they will get paid accordingly. So, it is not that there is a fixed salaried job per month you get so much, it is always very output dependent compensation.

So, if you produce so much labels in this particular time you get paid so much dollars etcetera whatever it is. So, it is very effective for simple labeling tasks like tagging people and objects within images. casting a sentiment opinion on pieces of text and tagging people places and products in text. So, very generic things which you give them the information and they just go on mechanically doing it. So, it will be a pure mechanical task they are not be using any of their business knowledge for this purpose.

They do not have we just have people young students you know people are looking for some money etcetera extra work and like that and you put them as part of your crowd sourced And then the step 2 is once you have done you have finished with your label then you frame potential AI initiatives. So, now you have collected your data whichever way 4 steps I had explained. And now we have to frame the potential AI initiative that is step 2. So, you start with a spreadsheet having the following information at a minimum.

The pain point, so you have to identify what is the pain point, what is the problem in the first case. So, you start any to solve any problem you identify the problem. Project description, so give a brief description, potential benefits, what is the benefits that you are expecting out of this tool development or AI development and the expected return on AI investment. So, you do something called what we call conventional user ROI return on investment.

So, you are now just expanding that into return on artificial intelligence investments or AI and data and feasibility nodes. So, these should be part of your minimum for your part of your spreadsheet to once you start working on the problem. The pain point the problem could be related to the workload or other issues and should be expressed with sufficient detail. So, people should understand what exactly you mean when you say I have this problem. For an example, an analyst can say generally analyze 200 reviews, but suddenly because of whatever reason the incoming load it goes up to say 2000 reviews a day for analysis.

So, the same example which I had given earlier. So, now they are overloaded. So, maybe 4 people handling 200 into 4, 800 reviews now it has become 2000 reviews etcetera. So, 4 people are proving to be highly inadequate and they have to spend long hours maybe double shifts and things like that. So, that is the problem.

So, your 5 analysts are not being able to cope up with this workload. So, the project is about automatic complaints extraction system with minimal human intervention. This is what you want to do. we are thinking of a AI solution, you want to have an automatic compliance extraction system with minimum human intervention. So, that these 5 people or maybe less should be able to handle 2000 reviews or maybe more or whatever using the tool which will automate in the compliance extraction system.

So, what it can do one of the solution could be it can as I said it can assign areas. Suppose you have people who are addressing the customers problem in different areas could one is could be related sales related, one could be the product related, one could be a quality

related, one could be delivery related etcetera after sales problem. product is warranty problem. So, there can be many types of problems and you can have many type of resolvers assigned to each of these problem types.

So, this whatever complaint extraction system you are designing should be able to route the incoming problem to the right resolver. So, am I sending the problem to the person who is supposed to solve this problem or who is you know interested or experienced to solve this problem. So, that is what is this automation you require. So, that problem keeps coming and they get assigned. So, the manual assignment stop work literally reduces and you can have some minimal checkpoints assigned because there will be some mistakes etcetera.

So, you need some people to keep an oversight that the thing is going fine. Now next step is to identifying the potential benefits. So, these are benefits are quite obvious. So, it is reduced analyst workload. Improved customer experience with a faster turnaround.

So, why you are doing this two things? One is from your people perspective for your employee workload perspective and of course, your cost perspective and the second thing from a customer perspective. is if they get a faster turnaround faster response from you there is a solution gets resolved faster obviously, you have a happy customer. So, you can prevent customer churn in that way and you can retain your customer or get more customers because the happy customer is always here. So, your advertising tool it is a thing like e word of mouth they will write feedbacks give feedbacks positive feedbacks in social media talk with their friends.

So, either e or normal word of mouth phrase about your quality of a service will be like your brand ambassador. So, they will work like your brand ambassador. So, reduced cost of analyst per analyst that is also obvious 5 people handling 200 and 5 people handling 2000 obviously, the cost per analyst also comes down. So, that is your bottom line. Now, expected return on AI investments you are getting these benefits now it will say something about the ROI the return on investment.

The conventional what we understand by ROI is not the only way or the right way to evaluate That is why we have formed this different terminological ROAI. This is not a regular similar to other conventional ROIs. Why? AI initiatives may take years to observe a financial impact.

Initial investment in AI infrastructure will delay the ROI because our AI needs lot of investment. So, you may not get the desired normally your finance person CFO will tell you that an ROI should be any payback in 3 years, 4 years whatever timeline they will give you certain time minus get my investment back in within this period. But for AI it should be it will be different timeline because AI investments are higher and the returns are may not be directly accessible. So, you can upfront cannot tell you say for example, this improved customer experience with faster turnaround the benefit from that it is kind of intangible

because it is very difficult to put some numbers to it numbers mean money value to it that what will be my gain, my profit, my top line, how it is going to get impacted because of this better customer experience. So, what needs to measure is not the immediate financial gain. but instead the impact on business process products and services. What you can give the message to your organization is that a success of this AI initiative for example, solving this pain point will motivate the company to go for more AI initiatives.

So, they said oh yeah AI initiatives are working it is actually solving the problem may be not immediately giving the financial return which it is expected, but at least it is solving a problem and solving my problem. problem, my employee problem and giving by a better customer satisfaction which I value very highly. It will give me a return in the long term sure, but it is they may be not giving immediate returns, but this is the success of a project has a cascading effect, it will motivate others your other departments other functional areas also to start AI initiatives.

So, that is the major I would say the benefit and the intangible benefit for behind the success of any the first starting project or initiative. For computing RO-AI you can do it as follows have a matrix. So, review the analysis time. So, this is only from your employee perspective not the customer part. You have a baseline starting.

So, what it is? It is 12 hours per day per analyst. So, that is the time they are devoting to handle this increased volume. So, expected ROI you can say 50 percent reduction in time to analyze the reviews. So, I want a 50 percent reduction in time.

So, instead of 12 hours within 6 hours. each of them should be able to complete together that 2000 reviews requirement per day. So, this could be an ROAI. So, this is not really talking in terms of the money part or the time and where the investment can be recovered, but at least you have a target. So, you have set a baseline and then you have a target to achieve through that metric the analysis time metric.

Now moving ahead, so I will discuss what do successful AI initiatives look like. So, you should know like this was one example. So, I will give you several other cases, instances or initiative types which are being done successfully by large organizations and that gives us a message that such initiatives can be taken up by most organizations. So, you consider three things behind what we define as a successful AI initiative.

What is success? So, you have to have three types of success one is for the model itself the business success and the user success. So, model success is understandable whether your AI model is performing at an acceptable level in development and production. So, development and production means development is a test environment where you try out the product the pilot or the proof of concept and production means in actual use in the actual business use. Like the previous example, if it is did help to reduce the time to 50 percent of what they are doing spending 12 hours comes out to 6 hours per employee

then that is I will designate that as a success for the AI model. The business success is whether the AI is meeting the organizational objectives. So, one of the objective is return on investment the CFO will insist on that. So, that is definitely one of the objectives. The other objective is whether employees are accepting the change, the changed environment and they are used to it because there is always a threat for AI initiatives.

The fear factor that employees think that because of this automation some employees may lose their job or may be transferred to some other department etcetera. So, whether that has been mitigated that fear factor will always be there. Let us assume that it will never be that it is not there amongst all employees, employee everybody feels that the threat part that they might lose their job because of this AI projects. So, the business success will come when or your employees you can mitigate their fear factor and give them a new scope may be other forms of jobs, other roles other positions may be transfer or whatever, but definitely not removing them.

So, that will never take as a success factor. from the customer perspective the user success whether the users are satisfied with the solution and perceive it to be a valid solution. Most of the cases it will they will because they are getting a turnaround time may be 50 percent faster. So, what they were getting in 3 days now they are getting may be 1 day. So, they will be happy customer and they are probably getting a maybe a same or better solution whatever it is, but at least they are getting it much quicker.

So, my problem is getting resolved much earlier that is what any customer would love to have. So, if you can achieve that particular metric customers will definitely be happy and

that then you can score it as a user success. As I was talking about how well it is performing that developing task. So, here I just for your reading reference you can go through these notes or what is the models false positive rate in detecting cancer or say a duplicate account. So, another aspect what was the time part etcetera and now if you take the case of say medical diagnosis.

you are say analyzing scans and diagnosing to say whether the patient has a cancer or not a cancer positive or a negative. So, in this case if it is a false positive or false negative either way then it is not the model success it is a model failure because anything for such cases can be very not only dangerous for the patient very expensive lot of money is spent for cancer test checkups and treatment. So, all these diseases and trouble for the hospital and the doctor as well. So, it is all round you create all round problem if such models give false positive or false negative responses.

So, one has to be very careful when you are deploying models in these areas commercial. So, you need to collaborate with the AI experts to establish the best matrix to assess the model performance. So, which matrix to monitor has to be decided jointly with the AI experts, business experts, and AI experts combined. Matrix is task-dependent. For example, for a sentiment classification task—positive or negative sentiment on a given text—80 percent accuracy is often considered acceptable. But if you compare that with a disease or cancer detection type of model, then the accuracy level expected should be higher than 95 percent.

Otherwise, as I was telling you, false positives or false negatives can both result in enormous difficulties for everybody. So, one has to be very careful when selecting the matrix and also conducting trials until you can be confident enough to achieve a much higher level of accuracy. But in some cases—for example, sentiment analysis for purchasing dress materials, clothes, etcetera, or any consumer goods—it is not so critical. Of course, higher confidence is always better, but we can assess it from a criticality perspective as to how much time, money, or effort will be involved during the model development process. So, if I want a quick win, I want to release the model quickly.

I can do that for cases where the criticality is not high, but I cannot do that for cases where criticality is high—if it is a safety issue or a disease analysis issue. So, these are things where you have to be very careful and take time to develop the right model. When you are talking about business success or automation impacting time savings, reducing

human errors, preventing customer churn. So, all of these we try to find out: Is it saving time?

Yes. So, reducing human errors is it more accurate? Yes or no or preventing a customer churn am I losing customers or I am preventing loss of customers. So, all of these directly give me business success apart from the monetary benefit which is the most tangible one. So, one needs to use this what we are saying as return on AI investment and following needs to be done once the business matrix of interest has been determined.

So, once you have identified the matrix which are the matrix will monitor for business success You start with establishing a baseline for each metric like in the previous example the baseline was 12 hours per employee that was the baseline and you want to reduce that set the ROI target. So, 50 percent of reduction in so, instead that what I take 12 hours I should finish the task in 6 hours continuously track the metrics obviously, day on day you find out what is happening. and then attempt multiple iterations of the baseline and target ROI for each metric till you get the best result. So, we started with baseline 12, 50 percent means 6.

Now, can I change the baseline or can I change the target ROI? So, that I can still further improve when the model becomes better and better with time with more data mode etcetera. So, it will do the job much better predictions will be more accurate that you know the allotment will be more accurate more error free. So, then can I make it work faster by reducing the timelines. So, instead of 50 percent I would say maybe 70 percent or 80 percent.

So, that what was taking 12 hours baseline now should take maybe 3 hours. So, that I can release my people to do other jobs. And the user perspective, user requires that you understand the user perception of the AI solution and the adoption of the technology is a key, the acceptance is the key and interacting with the users is the best way of finding out any issues related to the model or even non-model use issues.

So, you have to interact get the feedback from the user. Lack of synchronization of tasks with the output of the model may lead to the dissatisfaction of the user due to unnecessary wait time etcetera and they may abandon the solution. I will give you an example of Google sorry Airbnb where they have come up with a model which the house owners can use to better promote their houses and get better business, attract more travelers, customers etcetera. Now, it was found by a lot of analysis of actual data.

It was seen that the white household owners were getting more business compared to black household owners. This is an US situation we have a white population and black population. So, black way white were getting more and then they started doing the research and find out when was there any bias in the data to start with when they work in the model. But happily they realized that it was not a bias data against any against the black All that was impacting is the white people were spending more time on the tool they were actually using the tool and less black people black people were using the tool.

So, it was dependent on how much how many people were using the tool. So, since more black people by using a tool they were getting the result output they are getting better more customers. And since less black people were using the tool they were overall total black population you take they were getting less. So, then it comes a question of how do you educate your customers or your partners to use that tool for their benefit. So, that is what it is saying the lead to the dissatisfaction of the user due to unnecessary etcetera and they may abandon the solution

because if they do not find any value in the solution then they will not further use it. So, you have to educate. So, main thing is here in both cases if they do not like the solution and if they are not using the solution in both cases you need to educate your partners or your customers to use the tool and why they should do it the justification. So, once they start using the tool you can find out the success of the tool and they can reap the benefit of more residents or boarders or for them their customers.

The best way to measure the success is through the either interviews or surveys. So, you interview the interviews and conduct surveys with your customers and find out their feedback. So, some common non-model factors that impact AI success are not related to the model itself, but say poor user interface if you do not the user interface is not very user friendly for example, you will not like to use it. Lack of user training in consuming the AI output.

So, this is what I was talking about the user was not educated or trained or it could have been that the interface was not very user friendly, but in this case probably that was the reason the second one was more of the reason the example I was giving you about the Airbnb case. Wrong matrix to measure the ROI if you have selected the wrong matrix. So, that is the problem from the business side. And network latency that causes delay in accessing the output.

So, many areas for example, because of network everything has to be on the network dependent anything. So, that could create a factor for user dissatisfaction. Some successful AI initiatives. Optimizing operations in supply chain area, if you take say Amazon its algorithms are inventory placement, predict demand and power its autonomous delivery robots and drones leading to faster shipping times and reduced operation cost.

So, these are all just the projects they are doing undergoing and doing it many of them commercially successful. So, I will just read through and kept it here so that you can read through later on and come to know what these organizations are doing there is nothing to explain in any of this. do any explanation here. So, Walmart for example, just example the retail corporation they are employing AI for demand forecasting inventory management and optimizing the store layout. AI also plays a role in its supply chain by predicting potential disruptions and optimizing routes for its vast trucking fleet.

So, these are all very classical supply chain problem and they are using their and Walmart is a supermarket storing say thousands of items. So, how do you manage the supply chain that something is being sold out then need to be replaced and it is coming from delivery from somewhere etcetera. All these large consumer goods companies Hindustan Levers type Unilevers, Procter and Gamble they are all supplying. So, how do you manage the whole supply chain? So, they are extensively using AI models for this.

BMW group the famous automobile manufacturer in collaboration with monkey way. has developed an AI solution SORDI.AI to optimize industrial planning process within their shop floor in the manufacturing side and supply chains using their generative AI tool. This involves creating 3D models called known as digital twins, this is another topic of assets to perform thousands of simulations thereby enhancing distribution efficiency. So, your physical process you build a digital twin we say, so that you can try out various variables and parameters to find out how it will behave in the real one.

So, once you develop this model the digital twin and know which are the variables how it has to be what should be the various values etcetera parameters, select the identify the parameters which will influence the result and then use the same one in the real scenario. Geotab is a telematics leader utilizing AI to analyze billions of data points daily from millions of vehicles. So, from a auto cars connected cars and they are using sensors to collect data from the driving condition of the cars. The insights are crucial for fleet optimization, enhancing driver safety, promoting transportation, decarbonization,

informing macro scale transportation analytics for safer and more sustainable cities. So, geotab is something like assume like Uber for example, and there all the drivers are connected through the app. So, they can be continuously monitored for various conditions. road condition, safety condition, fleet optimization, how the drivers are getting loaded throughout the day. So, all sorts of analytics can be run on the business which is happening by thousands of drivers, their experiences shared throughout the day

and that can you can run an analytics and see how things can be improved further. Because getting data is not a problem because you are all connected through sensors through a phone, the thing is that you have to develop that AI model to analyze that data. Continuing with some other examples of personalizing customer experience and boosting sales, we have Netflix will recommend give you suggestion for what you should see the significantly enhance the user engagement and content discount. They will recommend things which are otherwise it is very difficult to for you to search out what actually will be liked by you.

So, Netflix will analyze your viewing preferences and tell you like this etcetera, watch this movie and program etcetera. Starbucks similarly uses a platform to get feedback from their thousands of millions of users and they can even recommend about different products and feedback on the products, they change their product based on this feedback etcetera. And they get more customer loyalty and sales because they are working with the customers to develop their services and also products. Sephora is a beauty retailer which apply AI through its virtual artist group allowing customers to virtually try.

So, you can try out make up this can be now people are doing this for dresses the sites where you buy a dress partially put on the dress digitally using that AI tool and find out how that dress will look when you are wearing it. Amazon again recommends engine a classic example of collaborative filter and deep learning drives a significant portion of its sales by suggesting products. based on your browse history. So, when you buy searching for something they might also you know say people have bought this also bought this and then the club together right group together items etcetera.

So, that it helps you to take decisions, but other from business side Amazon side Amazon is benefiting because they are increasing their sales. Enhancing customer service, so many companies using chatbots and virtual assistants that we all of us know that how they help us the customers to interact with the company on a 24 by 7 basis. A new bank example ALBO is leveraging AI to revolutionize customer service and financial

education, optimizing processes for faster and more efficient response and offering educational tools to users. So, the bank is training user teaching customers through tools educating them on financial

processes so that they can take better decision. Suppose you want to buy a mutual fund for example, which to buy? So, they will provide this education online to you know, so you understand what these mutual funds are and how do you assess them and you know etcetera take a decision. General Motors, the most used is one of the biggest automobile manufacturing company has incorporated again AI features. including a virtual assistant powered by Google clouds conversational AI to better understand and respond to driver requests and needs.

So, with the driver is driving the car it can talk to this Google assistant on the phone and then General Motors is collecting all those feedback from the driver what they need, what is the problem etcetera. And this is very crucial for not only automobile regular drivers, but if you take the truck drivers they have lot of problems they have to travel for days. of kilometers, 3 days, 4 days. So, they have lot of issues which we normally do not comprehend or understand.

So, the best way of getting the feedback if you can get a continuous feedback about their journey 3, 4 days, nights etcetera, what are the troubles, what are the facilities and what are the features they would like to have for a safer quicker journey. Nutella is a brand used in AI algorithm to generate millions of unique packaging designs making each jar a collective item. So, utilize a food product and so they have this in jars and so they are using AI for unique packaging designs.

BMW also has utilizing AI for ad campaigns, creating localized visuals, headlines and social media content tailored to different markets and lounges. Languages showcasing AI's potential in creating very contents of this back to content generation to be used for marketing purposes. So, they just represent a fractional successful initiatives there are several other initiatives, but broadly speaking you can you know try this out. So, this is a canvas tool I will quickly go through which nothing great very simple. So, deploying and the use case was deploying an intruder detection system which will predict an unwanted intruder.

So, in a house safety you want to put or office or organization. So, what you want prediction? So, what we need to know to make the decision predict whether the alarm is caused by an unknown person versus something else could be a true or false could be a

genuine person. How do you value the different outcomes and errors? The judgment part compare the cost of responding to a false alarm and the cost of not responding to a true alarm.

So, actually there was a intruder, but you said no fine I think I guess it is probably genuine person not a problem. So, there is a cost angle to it action is what are you trying to do dispatch a security response or not. when an alarm is triggered and what is the outcome, what are your matrix for task success. So, observe whether the action taken in response to the triggered alarm was correct or not. So, when I sent a security person there was actually there was a problem.

The other case could be I had sent the security person, but it was not a problem it could be at some dog stray dog etcetera. What data input is what data you need to run the predictive algorithm obviously, history sensor inputs from movement camera heat at each point in time when the alarm is on. So, these data are required to operate the AI. So, you have to have a visual system camera etcetera to collect the data and for training purpose you need the previous data.

So, whenever there was a problem an alarm that is a genuine problem. So, you take that data. So, historical sensor data will match with the historical outcome data. So, whether when the sensor said yes and it was intruder and it was actually intruder. So, all historical data will need to be trained.

for the training part and the feedback is how can you matrix work for task success. So, sensor data matched with data collected from the outcomes will give you the matrix results verified intruder versus verified false alarm. So, what was true what was false. So, cost versus trade off. So, some people will prefer to trade the cost of dealing with more false alarms for enhanced privacy.

So, that is your business priority how you want to do it. So, I will find if it is false, but I will keep sending my security guard because I do not want to take a chance of whether it is true or false. So, any intruder sensor I get warning I will send my security guard. So, there is limitations of things to consider this thing called hallucination which is very well known. So, sometimes all these generative AI models say something which they are not supposed to say because they do not know the answer.

So, they will send out some gibberish answer. So, that is a risk part. So, be very careful whenever using generative AI. Take care of this hallucination thing; you can read a lot

about it on the internet. So, I will conclude here that whenever using generative AI, be careful about one factor, which is known as risk. So, whether your answer is the right one or it has something completely wrong, you must verify.

So, you should take care every time you are using generative AI. So, with that, thank you very much. So, we move on to the next lecture.