EMERGING STRATEGY IN ARTIFICIAL INTELLIGENCE ERA

ABSTRACT- Artificial Intelligence is redefining the business strategies. It has been dominant especially in Blue Ocean strategies, to make competition irrelevant. It is also helping in development of new product. Frameworks have been also developed to execute strategies backed by AI. ADE framework is one of such frameworks for implementation of digital products. Organizations are also making internal structural change to implement the strategical changes to execute it fast. In AI-driven organizations, new roles have been developed like Chief AI officer, AI strategist, AI product manager etc. Through process performance, AI is providing strategic advantages to the organization. Marketing decisions now depend much upon insights provided by AI tools. Tools like AI canvas have been used to achieve to make an overall great view of the project. This explains all like what data will be needed and how available data will be utilized, what skills we demand from our employees for the project, the value added by the project, key stakeholders involved, way of approaching to customer. Now with this framework, organization need every point to take the decision. Now the cost involved could easily estimated and sources of revenue could be established and hence with great vision, organization could proceed further with proper plan and strategy.

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Literature Review

Artificial Intelligence is emerging tool to implement the strategy in business world. So many researches has been done that how could a company leverage AI to build and implement strategy. Most research that has been done in this field has two or three unique elements like goal company wants to achieve both short and long term, identifying opportunities and key metrics performance to measure that whether the strategies planned by them is moving in right direction or not.

In a paper published by *David Kiron & Michael Schrage, "Strategy For and With AI",* they have mentioned that for any organization key performance indicator matters the most to implement the strategy. For this organizations could adopt AI & ML techniques to specify, to calculate and optimize the KPIs. Focus is also given on quality data to achieve the most accurate result.

In another research by "*Kiron & Scharge,2019*" where again the focus is on quality data to support decision of an organization. Considering this as base in research paper published by "*Demirkan & Delen*", they have suggested a flexible framework that uses AI/ML techniques to support data-driven decisions.

In another research published by *Aline De Fátima Soares Borges & Fernando José Barbin Laurindo, "The strategic use of artificial intelligence in the digital era",* they have focused on four things 1) decision support system 2) employee & customer engagement 3) automation of process 4) new services and products. They have talked about at what perspective management is lacking and how they could fill this gap to achieve a strategical advantage over their competitors.

In this project, points coined by various researcher has been taken and try to define how AI could help them in implementation of strategy. A framework for development of digitally products has been considered. AI help in blue ocean strategy has been explained that tells how with help of AI, companies could enter new market and make the exiting competition irrelevant. Value & fit framework for implementation of Blue Ocean Strategy from the health care point of view is given. Also, example of Blue River technology is given that how it is implementing AI blue ocean strategy to cut cost and capturing the maximum market in agriculture industry. Also, it is tried to be understand that how AI could help in removing the roadblocks which comes in development of new products.

A framework through the example of Tesla is given to understand it on practical level that how an organization adapt it. The framework is 9 step box framework that provide insight how to define your objectives, link it your strategic goal, which is mentioned in research papers of above-mentioned people.

Also, the change in organization structure is also considered and discussed that how companies are changing its structure to implement AI based strategy to achieve a competitive goal.

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Executive Summary:

AI based strategies are becoming commonly implemented these days by the organization. Competition is cutthroat in business world as there are too many players may compete for fixed segment of customers. So, company has chosen a blue ocean strategy to compete than via traditional red ocean strategy. AI helps a lot in blue ocean strategy like providing a new way to define the value proposition of business. They reduce the time gap for processes and hence makes process faster. It could be seen in any field from healthcare industry to agriculture industry. Different AI frameworks could be used to carry out such projects. A commonly used framework could be *value & fit* framework, which consists of three parts, external environment, value proposition and organization & execution.

AI has come up with a lot of significance where strategies are based on to build the new product development. Here strategies are based on reduce the time-to-market and at the same time improve the quality of the product through offering personalization. A new digital framework has come into existence for the development of digital products. The framework is called "*Autonomous Digital Enterprise Framework*". This model is very agile and flexible. It consists of five main parameters and keeps the customer at the centre. It provides a way to enhance the customer experiences and automate the task to focus maximum on cognitive tasks. Overall, according to PWC report based on such digital frameworks efficiency of digital products is predicted to be increase by 19%, and time to market and production cost is expected to be reduced by 17% and 13% respectively, over the next five years. Strategy based on AI would also provide a way to remove the roadblocks in new product development. They would provide information in a way, that would be very helpful to fight against existing competitors. Another way AI helps is through providing feedback about how it is possible to enhance product usability. Also, it helps by demand forecasting of new products that influences the sales most, which was initially based on some feedback from informal & formal channels.

Next, we have specifically studied AI strategy framework of Tesla for its self-driving cars. All the possible factors that need to consider are taken into account. Points like linking the strategic business goal to AI, that needs to achieve. Key results and business metric that Tesla self-driving car needs to be achieved, in our case car driven in auto-pilot mode. Next step is to consider AI approach and required data, followed by ethical and legal issues that might come into the way. Following that technology & infrastructure needs to be considered, with skills of employee and capacity of an organization. Last step involves implementation of challenges and how implementing the project would affect the organization.

To implement the AI strategy any organization needs to be completely ready with flexible organization structure. Initially it used to be structural but given the current needs most have made it to cross-functional with decentralized structure. New roles have been created like chief AI officer, AI strategist and AI product managers. And to sustain this AI culture and make process smoother among management team that might not be familiar with AI, further roles have been generated like trainer, explainer and sustainer. Trainer has a role to teach the system how they should perform, explainer has a role to bridge the gap between

technologist and business leader and sustainer role is to ensure that AI systems are operating as designed.

AI strategy also plays a crucial role in developing marketing strategies. In initial stages implementation of strategy starts by establishing goals, maintain data quality, considering data privacy standards, data quantity and sources, and finally acquiring data science talent. Here as any AI project challenge may arise in source of data collection. It may be primary source like own CRM or going for external sources.

AI could help through programmatic media buys bidding, that helps by programmatic platforms to bid on ad space related to reach right people in real time. Through this marketing teams are targeting appropriate channels at the right time and that too for a competitive price. AI/ML also helps to build a customer profile by what type of messages customer would respond and maximize the conversion rate. It also provides a competitive advantage through granular personalization. Another part is predicting marketing analysis. Here AI let understands what type of products consumer prefers when and let company build a strategy. Amazon follows such type of strategy in business world. Other advantages it provides through dynamic pricing and enhance conversational experiences through chatbots.

Generally business strategy and AI strategy are complement to each other. AI strategy derived from KPIs. For designing any AI based strategy five things are generally considered. First element is data. As discussed earlier it is about collection of data. Second part is infrastructure. It includes making the data available and supplying the required processing resources needed to process the data. Two points need to be considered here. First is about building unified data-warehouse and second is about going on cloud or invest in its own infrastructure. Next point is to skills that are required and making an AI team in organization to better flow of ML process and make sure that AI process is understood by everyone in organization.

Implementation of AI strategy in startups could vary from corporate. Strategy for startups is to get into the virtuous cycle of data. Aim is to focus on better customer interaction then later improve the product with help of AI.

Another framework to build an AI strategy is through AI project canvas which is derived from business canvas model. It has eight blocks divided into four parts namely value propositions, ingredients, integration for customers and finally financing. Through this 30+ pages explanation of model could be summarized in one page and provide a way great way to understand the project to management as well as stakeholders.

Keywords: Artificial intelligence**,** strategy, business model, blue ocean strategy, deep learning, LIDAR, self-driving cars**,** product development

Proposed methodology:

The project involves research data from various reports and articles, so the project is based on secondary research. So, the project involves analysis of many research paper and it is mostly qualitative in nature. The analysis here is focused on organization requirements, how implementation of AI strategy is linked to their business goal. Project also tries to capture the KPIs related to implement the strategies by organization. Information is generally taken from official websites of organization as far as possible.

Objective of the report:

Primary objective is to study the emergent strategies in this AI era. Basically, it contains information regarding that how the strategy implementation is reshaped by the artificial intelligence. How with inception of new term like *AIBOS* etc. giving competitive edge to the companies. It tries to study how the companies especially startup using AI based strategy to grow faster in business world.

The project also tries to study the new frameworks that have been developed in this era to development of product faster, studying how AI based strategy could remove the roadblocks for organization in development of new product as well as in diversification. It also tries to understand one of the strategies in real world by taking example of a company, in this case Tesla. Aim here is to study how the organization linked itself to strategic goal, technology, and infrastructure it needed, ethical issues and challenges it faced for implementation of those strategies.

At last project has aim to understand how organizations are shifting itself to execute those AI based strategy faster. So, the focus here is to study the organizational structure of AI companies. Also, to study them by comparing what its structure earlier and how AI has reshaped the structure.

"The greatest danger in times of turbulence is not the turbulence – it is to act with yesterday's logic"- Peter Drucker

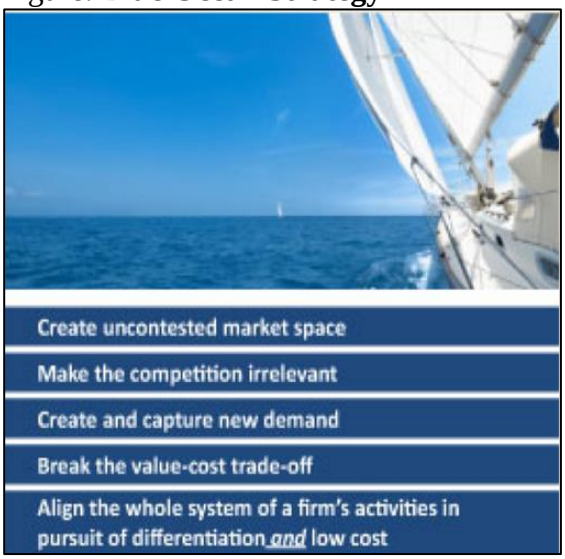
AI is driving the business world, causing organizational changes to redefining business models. Nowadays, it has become common to see words like "data-driven" or "AI-driven" solution. The business world is using it regularly for planning their strategy and predict the outcome of that strategy implementation. So, AI is focused now more on strategical changes than the tactical ones. Different industry uses it in different ways. But whether an organization is evolving or evolved, there are some common elements, including infrastructure, business model, and ethics. And also, they have common goals, as with any business, increase profit, reducing cost but in some new innovative way, that wasn't there earlier.

It has provided a new way for companies to redefine their strategy by giving insight into consumer acquisition and reducing customer churn. These things have led to changes in business model, which is the basic building blocks of any organization. For example, OrangeShark, a digital company has come up with a *pay-for-performance business model*. Customers just pay a fraction of the gap between a traditional advertising model's consumer acquisition cost and the OrangeShark model. as company has come up with the model of automating process of tools of media selection, placement of the ad, CTA and conversion monitoring, thus saving all the cost of semi-automated process, and has led to more profit.

Companies are successfully implementing blue ocean strategy by reconstructing the market boundaries with AI strategies, letting the company focus on big picture and getting the strategic sequence right. Whereas the rivalries among companies are fierce, AI has also helped with *red ocean strategy*. To understand all these better, let's focus on understanding these two words in detail.

Figure: **Red Ocean Strategy**

Figure: **Blue Ocean Strategy**



Implementation of AI blue ocean strategy:

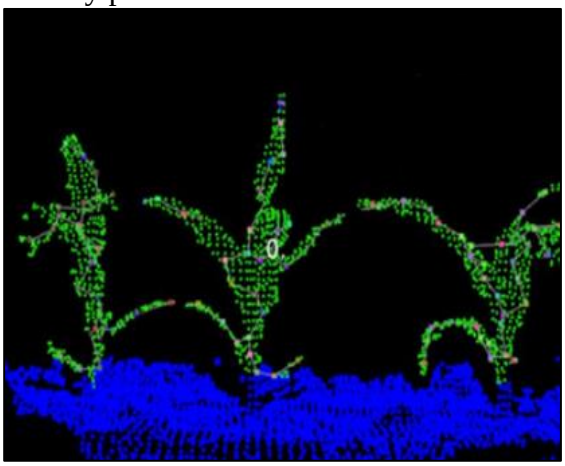
Artificial Intelligence is mostly operating in blue ocean strategy; a new term has been coined *Artificial Intelligence Blue Oceans (AIBOS)*. The idea is to get out of the competition of the red ocean and explore a

new market for yourself, which according to *Ansoff Matrix is diversification.* The idea here is to be differentiating yourself from the competitors by eliminating and reducing the unnecessary factors, which ultimately results in reducing the costs and also at the same time focusing on enhancing product value through working on uniqueness of product that is useful for solving customers' problem in better way. If achieved in this way, it will automatically increase the demand of the product. As also said by the venture capitalists like Peter Thiel *"competition is place where the business ends".* So, the idea is to escape competition and focus on business development.

The main factor in AI Blue Ocean strategy is "*Value Innovation*". Here AI will not only redefine the value proposition for the existing customers but at the same time will come up with a totally new value proposition for a new target market.

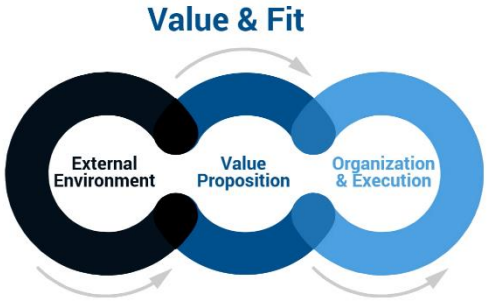
Let's take an example of Blue River Technology in the agriculture field. It is helping the farmers by eliminating self-searching the weed plants and take them off manually which is cumbersome tasks. Company uses machines which leverages deep learning and computer vision to recognize and spray herbicide only on weed plants, and fertilizers only on productive plants in a large field. This has reduced the agriculture expenses for farmers as it has saved the 90% of herbicide as initially it has to sprayed over entire field and provided the competitive edge over competitors' like Norfield industry, CP_Manufacturing and other traditional companies which only focused on ploughing the field, hence this company has demonstrated blue ocean strategy with new business model. Their business model was successful with 95% accuracy in real world and currently it has been bought by the John Deere company. This has been cited as the revolution of agriculture industry by the experts as it is totally AI based.

Figure- Blue River Tech uses pixel labeling and other deep learning algorithm to identify plants.



Source: medium.com

Another disruptive innovation of blue ocean strategy could be demonstrated through following AI framework in healthcare industry especially in detecting stroke.



External Environment- In the time of COVID-19 when the hospitals staffs and doctors are busy with COVID patients. Hospitals are crowded with COVID patients. Viz.ai has seen change in external environment. Based on this external environment changes Viz.ai has redefined its value proposition.

Value Proposition- Generally in case of stroke detection, after CT scan data goes through technologist, radiologist, ED physician, neurologist and then finally to interventionalist, hence there are so many

stages involved, which increases the time, and in case of stroke, every minute is crucial, this LVO (large vessel occlusion) stroke scan is analyzed by AI software and directly notified the stroke team, hence reduces the time of three hours to three minutes. And currently it being only FDA approved AI software, for automatically stroke detection without any human help.

Organization & Execution- As expected of any AI team, Viz.ai follows a cross functional team structure. Domain experts, technology experts, product designers all work together. Role of intermediaries have been reduced to make process faster.

New product development through AI

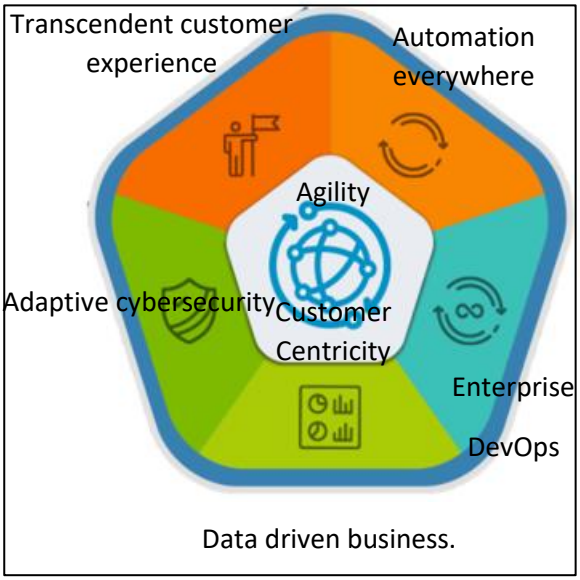
According to *Ansoff Matrix* to compete in an existing market, to increase its share, company has to come up with a new product that would provide an upper hand over their competitors. In recent years' companies are making full use of AI to make a better new product that would capture the market opportunities. Let's take example of how AI is helping in new product development:

Reducing the time-to-market, at same time improving quality of product and helping by offering personalization:

AI based framework for development of digital product:

AI is creating an environment where it is integrating superior suppliers, engineering, marketing, DevOps, product management team, pricing strategies & sales to make sure that development of new product would succeed in market. There is a new framework model called as "*Autonomous Digital Enterprise*". This framework has provided new business model to redefine digital businesses with AI/ML expertise, and competitive differentiating factors supported by "*agility, centricity and actionable insights*". This framework provides flexibility and provides a fast response to customer demands and requirements.

Fig: ADE framework



Transcendent customer experience helps by providing customers what they want, where they want it, and it is customized to their requirements and preferences. It is able to anticipate customer need based on past experiences and if done correctly could exceed customer expectation.

It is more than ever needed, because of COVID-19 many urban people are going digital for their shopping and other purposes. According to "*PwC's Global Consumer Insight Survey 2020*", 90% of those gone digital has a plan to stay on this online platform. Now according a research by *HubSpot* (a market intelligence company), because of this increasing number of users, every 33rd visit end up in a chat, and company receives thousands of those visit per day. And at the same time user do not necessarily start chat from company website but through company's Facebook page or other social media pages and wants their response quickly. Now chatbot backed by AI is helping, solving customer query quickly, thrice faster than

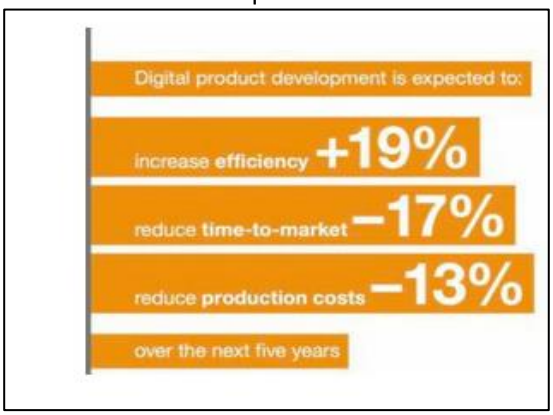
any human can do. At the same time, it has kind of prepared a summarized personal profile for consumers, as customers have expectation that companies will remember the past context, especially in omni-channel communication. Organization has implemented it at the top of market funnel to quickly solve the basic queries as a product takes the attention of customer, middle of the funnel as customer compare the product and evaluating decision. Here the AI could offer them suggested webinar and light services like live chat, and hence saving much of human resources of company and those human resources could focus on other high-thought-process task. Also by this way AI help in making profit by reducing the cost that would have to be spend on sales person. Hence overall here with one tool we are doing two task, better customer relationship management and making good revenue.

Automation everywhere leverages the use of AI to improve the performance of an organization, as well as innovation and efficiency. After applying the automation intelligent process across the data, systems and workflows, speed & accuracy could be increased, cost could be optimized and operation of scale could be securely enlarged. By providing AI-powered visualization, insights and observability across applications and systems business workflow would be automated. The process will speed up the application delivery, resulting in lower operational costs, would boost the performance of organization.

Enterprise DevOps is useful in developing and delivering software faster helping to win as well as retaining customers at the same time keeping the quality uncompromised. This could provide agility & flexibility to answer quickly the changing needs of customers. This will also create a stage for **data-driven business,** which could extract data from customer engagement platform and also from social media & IoT. So, basically converting raw data into insights and action backed by AI. It will find new revenue streams. And final step is to **adaptive cybersecurity** which combines AI based solution to detect internal and external threats. Combining all these, lead to a success of new product development of digital product by AI.

According to PwC because of AI, efficiency is going to increase, time to market as well as production cost is going to reduce.

Fig: Digital products are expected to boosted because of AI techniques



Source: PwC report.

Removing the roadblocks in new product development:

In any business the biggest problem is the competitor. Here AI helps to let business know what factors contribute to the market. It could be even useful for entering new market with new product development, especially useful when you're entering into new market. Coming up with new product in a new market would be classified under "*diversification*" in *Ansoff Matrix.* For example, there is an AI based company in food and beverage sector, Gastrograph AI, which uses artificial intelligence to predict the flavor preference of billions of consumer groups. It empowers companies

to look beyond what is currently in trend, compose a successful food & beverage product, which would be backed by customer sensory intelligence. Here any client simply has to ask, "*Optimize saltiness level for Millennials in Brazil"*. So basically, this AI tool, allows you to customize flavor based on factors like country, gender, region, age, taste experience, smoking habits etc. So, the AI tool will generate flavors that are not offered by the competitors, but at the same time program makes sure that, this new product would be loved by the consumers. So, this AI based program assisting in a new development of products and reducing the risk for a new entrant in new market. This program could also read & analyze competitors offering, so removing the most critical roadblock i.e. competitors.

Figure: Ansoff Matrix. AI is helping in new product development & diversification.

Utilize AI to evaluate and provide feedback about how it is possible to constantly enhance product usability:

A/B tests and multivariate tests are popular for DevOps, engineering, and product management to define the usability characteristics, business processes and app & service responses that are preferred by the customers. The challenging task in any development of new product is to make an effective, intuitive experience for user which is engaging, this turns usability into strength of product and hence advantage for brand. So, it is possible to offer desirable consumer interactions when AI techniques are part of the standard new product development cycle, including usability.

Demand forecasting of new products which includes the driving factors that influences the new sales most, and this result is calculated with help of AI:

Initially it was focused on querying from channel partners, depending on insights provided by direct and indirect sales team that what would be quantity of new product would be sold. Now the organizations are shifting to AI based statistical software that provides various variation that lead the team to know about the performance of their new product. According to this insight provided by AI software they could know what amount of promotion is required and what kind of marketing tactics should be adopted to maximize the sale. AI/ML are proving useful for consideration of causal factors that have historically not been considered to impact demand.

From the above statements, role of AI in new product development is crucial whether the development is for existing market or whether it is for diversification i.e. entering with a new product in a new market. Apart from this, AI based techniques are also creating models for defining the product line extension, signaling when it is time to add new product. And also, providing the guidance on most profitable up-selling & cross-selling opportunities by the product line and across the customer segment.

So, it could be said that now the competition is based on how well an organization applies the insight provided by these intelligent tools.

AI Strategy Framework followed by Tesla for autonomous car

1. Link to strategic goal **Strategic business goal that AI will support.**	To get ahead of in automobile industry through bringing self-driving car. As this industry is very competitive, leveraging AI could provide an edge over traditional car-makers. It would act as Point-of-difference (POD) over total human driving cars.
2. Objective **Objectives of this AI use cases.**	Objective is to make autonomous car that people could rely upon. For *actor* it is to provide a way, to be free to do their task while being on their journey. Also making safety mechanism so strong, that could become unique selling point.
3. Success measure (KPIs) **Key results and business metrics**	Most important KPI is *autopilot miles covered.* Currently it has totaled up to 3 billion self-driven miles as of April 2020. Other metric is sales. Currently it has sold over 900K vehicles & estimated to make $2 bn from sale of self-driving software.
4. AI approach & required data **AI approach planning & data that will required.**	Success is dependent on total miles that are driven in self-driven mode because cars follow ML algorithm which is dependent on data. So, data here is the miles driven and cars are connected through network, one car learn other also learn.
5. Ethical and legal issues **Ethical and legal issues that might be faced by organization.**	Ethical issues have to be faced like if machine has to choose b/w passenger's life and life of person outside, what would be the car decision. How it decides, whose life is more important? AI based cars are not recognized as legally responsible moral agents.
6. Technology & infrastructure **Technology & infrastructure that would be required.**	It requires real time data from sensors, LIDAR, radar, cloud services & camera to function. Also require external infrastructure like harmonized regulation, on-road telematics, crash barriers, lanes, excellent road and signage.

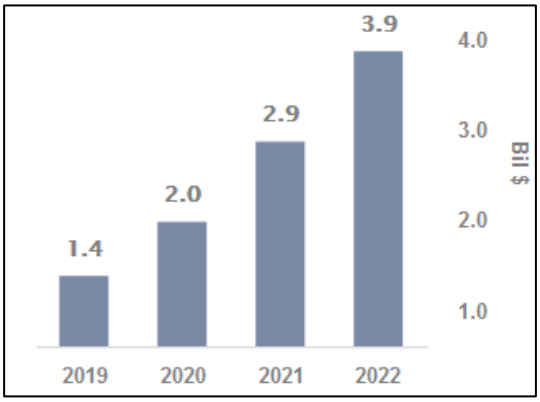
7. Skills & capacity **Challenges around skills, capabilities, capacity & resourcing.**	Its Model X car in autopilot mode ran into concrete and driver died. That led to questions by many people regarding the self-driven car. Plus, any incident happens with other company of autonomous car, every autonomous company comes into radar. Also, driving of such cars are limited to some areas. Making autonomous vehicle more powerful & expanding it would be challenge. So, engineering skills has to be enhanced.
8. Implementation **Finding out implementation challenges. also by whom project will be delivered**	Implementation is mainly done through Tesla operation management team with engineering team on overall agreement of higher management team. This includes decision taking on design of goods and services, quality control etc. Challenges could come in process and capacity design. Also, the centralized organized structure of Tesla make decision making process rigid.
9. Change Management **Affected employees and Managing the change**	For making self-driven car it takes co-ordination between production team, design team and engineering team. However, on any unexpected issue or accident, question from engineering team is always asked first. Engineer teams are now closely being watched by senior management. A team has been made, that check braking, steering and acceleration works accordingly to autopilot decision.

Summary: There is a cut-throat competition in automobile sectors, with many players competing. So, providing feature of autopilot gives an edge to the company. Auto-pilot will act as a point-of-difference (POD) against traditional competitors. The objective is to provide safety mechanism that could become a unique selling point for the company. One measure criteria for success of self-driven car is autopilot miles driven. Currently Tesla has driven approximately 3 billion which is higher than any competitor in autonomous automobile segment. Technology used here is network learning, i.e. one car learns it transfer its learning to other cars. Currently it is also facing ethical issues of questions like, choosing importance of life among two people, i.e. how to minimize the damage. So, it is currently not seeing as moral responsible agent. Technologies it leverages of cameras, lidar, sensor, cloud services etc. It also need external infrastructure to function well like harmonized regulation, well designed road etc. Since, many times accident happens in autopilot mode, autopilot has lot to improve. And also, autopilot working is limited in only some area, that needs to be expand. Implementation of this autopilot project is done through operation team and engineering team. Here challenges could come in process and capacity design and centralized structure could make process rigid. Now to process make smoother, engineering team has been closely watched by senior management.

Tesla making revenue through sale of full self-driving software upgrade

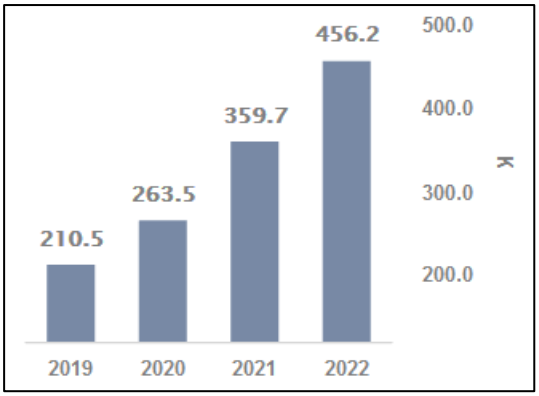
According to a report it is expected that tesla would sell 475,000 cars this year, and about 56% of customer will go with full-self driving feature. And would lead to 263,000 software upgrade. In the month of July upgrade of software was $8000. If we multiply this by upgrade sold revenue of approx. 2 billion in 2020 only from sale of software.

Fig- Self driving software revenue (AxB)

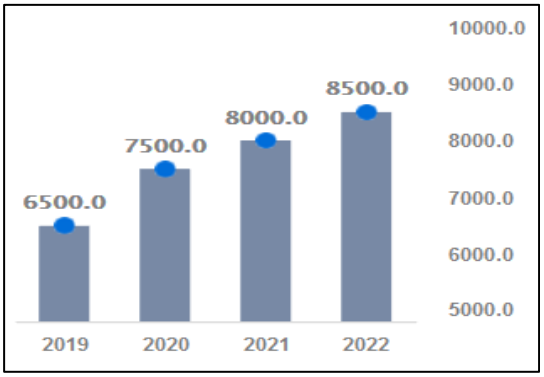


Source: Terifs.com

Fig- Full self-driving upgrades sold (A)



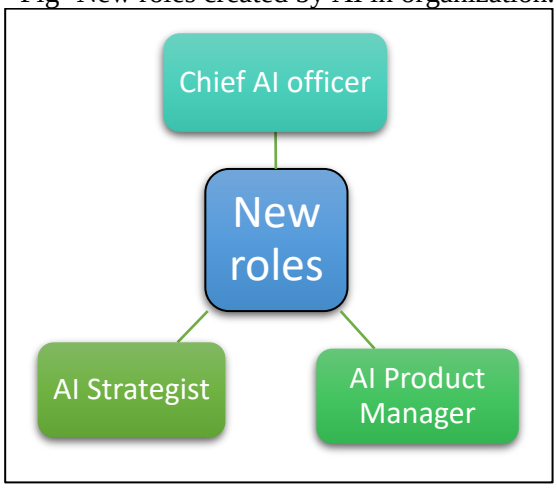
F- Average price of full self-driving update(B)



AI strategy implementation & Organizational structure

Since AI has changed the way businesses are conducting, to better implement the strategies based on AI, organizations are shifting itself to a better way. Also, it has created some new roles in organization as well as eliminated it. Roles which were repetitive and could easily be solved by the AI based technologies, are now removed to cut down the cost of operations in the organizations. Aim of creating all roles is to come up with a well-defined plan that guarantees the maximum return in least number of resources.

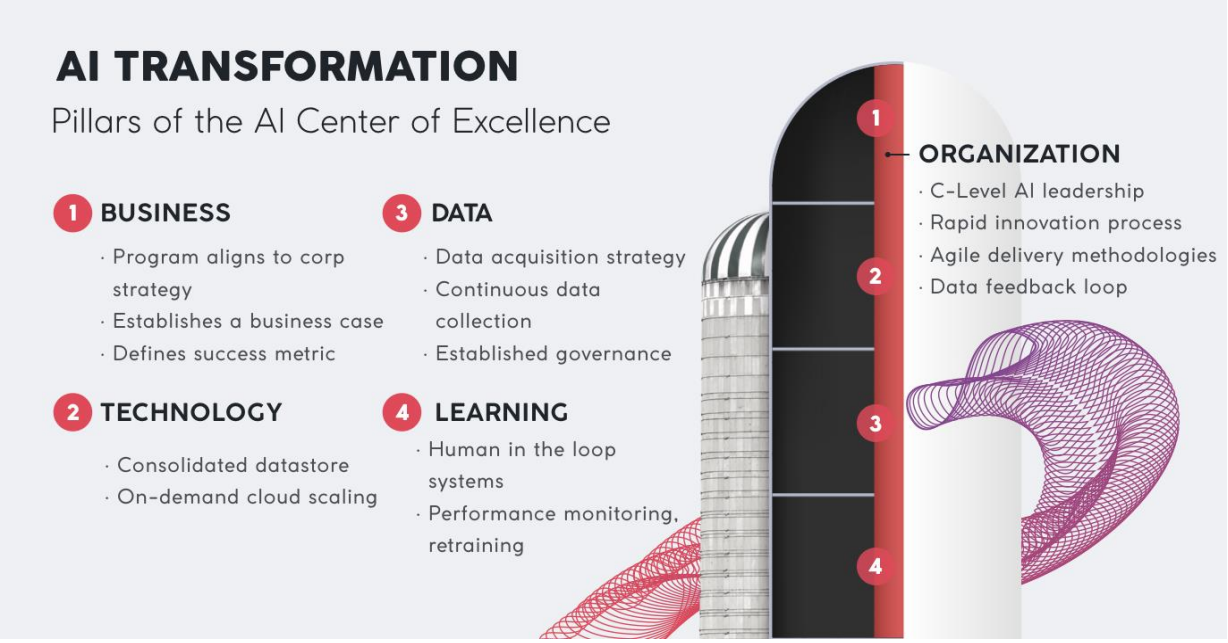
Fig- New roles created by AI in organization.



If we talk about pillars of support, of any AI based organization, these would be the: data, technology, and DevOps. Another very important task here would-be data collection. So, the role of AI strategist, here comes into play, by specifying what data to capture to produce key intelligence and ensuring that how it will be captured.

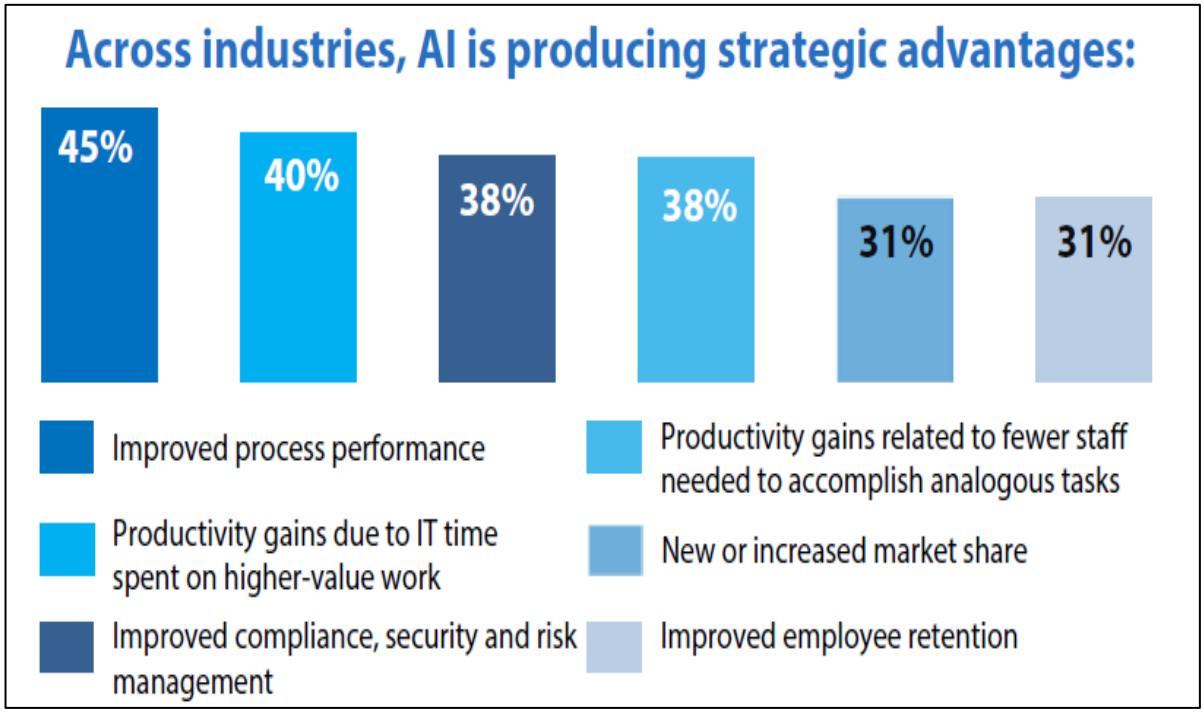
Organizations also has to take care of human-in-loop system i.e. a team of few people, monitoring when system performs not expectedly and make mistake. Example could be taken of, chatbot in call center, though handles many tasks but forward exceptions or difficult task to human.

Figure- In AI driven organization there is rise of Center of Excellence (CoE). It will responsible for all the data assets of organization, and will ensures that data is ready for any project.



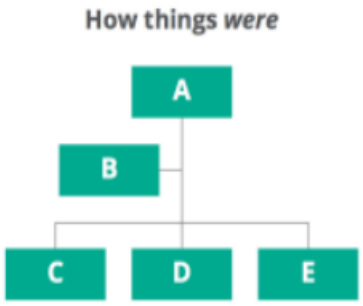
Source: AI impacting organizational structure. URL: < https://medium.com/kung-fu/how-ai-will-impact-organizational-structures-f970690fe5d4>

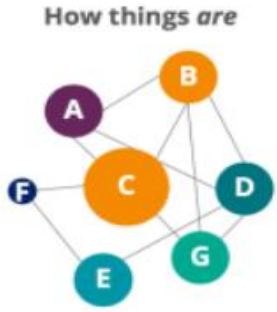
Fig- Graph showing that for which purpose company uses AI for its strategy implementation. Mostly it has been used for improving the performance of the processes.



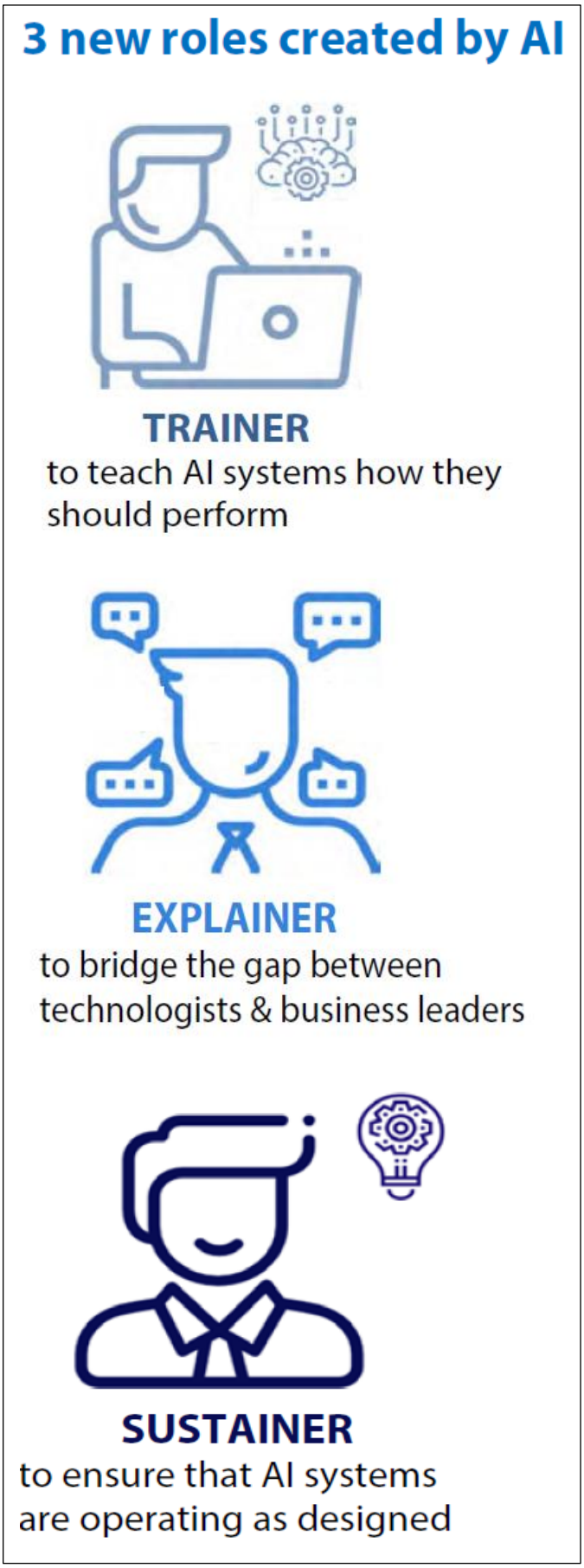
Source: Infosys AI maturity index study

Organizational flexibility is the major change that it has brought the current business organization structures. It will also impact the leadership roles. New word "*augmented manager*" has been given for managers working in AI industry. These managers have to treat AI like an assistant as well as adviser, because most of the time they have to rely on insights provided by AI technologies. Also, it would lead to more functional changes. Those employees would be preferable who would be able to adopt the changes quickly.



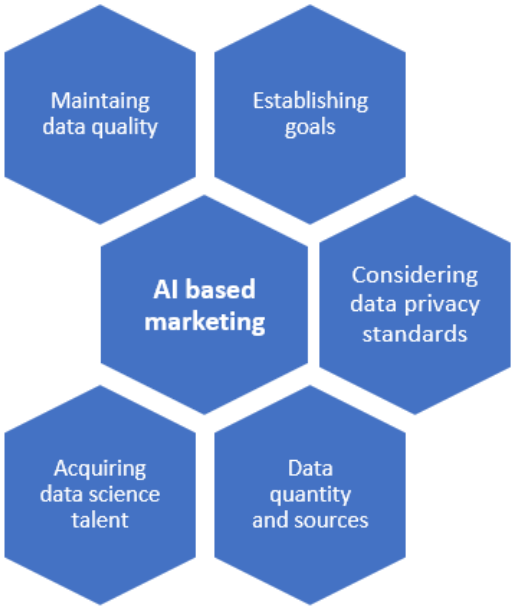


So, in the AI era cultural fit has gain more significance as the mostly teams now are cross functional. Even the HR roles have been redefined, rather than what they were initially into the traditional recruiting roles, has been now doing by the AI software, so they could get a better employee for this redefined kind of organizational structure. Hiretual, Fetcher are example of such AI software. If we talk internally, there needs to be some mechanism to communicate between business technologists and AI experts and shown in figure in right side. All these has led to decentralized organization structure.



Developing an AI based strategy for marketing purposes.

Artificial intelligence plays a significant role in connecting marketers to consumers. Marketers uses AI as a tool to build strategy to attract new customers as well as to retain existing one. So, the next question arises how to start with AI to have strategic advantage. The following diagram explains the initial requirement for any marketing project based on AI.



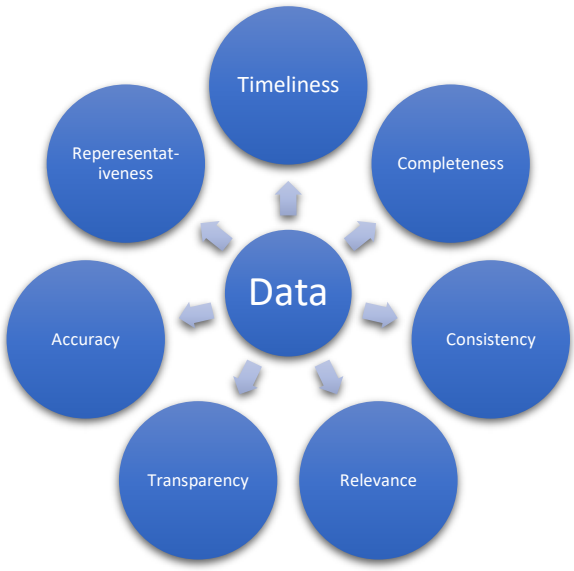
Here we must start with identifying areas where AI could help in improving the operations. For example, one such area could be segmentation. Then deciding the KPIs that would provide help in measuring the success of the campaign.

To ensure data privacy standards, AI platform should be well with-in ethical framework standards. Only acceptable use of data should be made and should not cross the line in by giving personalization as reason.

The next in initial phase is data quantity and sources. As we know AI/ML based tools generally works on large amount of data, so to have a better understanding of preferences of customer, external trends, a reliable and good amount of data is required. It could be taken from internal and external sources. Internal sources include own CRM, website data and marketing campaigns run by the company. External data may include information from secondary sources. It should contain information about location, and factors that influences purchase decision.

Organization must make ensure that they have sufficient expert employees to make good use of data and can deliver the meaningful insights. But if company lacks expertise, they could outsource the work also.

To have insights error-free, data quality must be maintained. An excellent co-ordination is required between marketing team and data management team. These seven essential data elements must be preserved as shown in following diagram.



Following ways AI could help in building a marketing plan:

1. Programmatic Media Buys Bidding- Marketing team often faces the problem of where to put the advertisement and messages. Based on user preferences and history, they make decision but those

decision does not pay often and, they are not agile & flexible to make decision in real time. So, here AI helps in reducing the risk by programmatic advertising. Machine learning is leveraged by programmatic platforms to bid on ad space related to reach right people in real time. The bid is driven by details such as interests, location, buying background, intent of the buyer, and other things. Hence marketing teams are targeting appropriate channels at the right time and that too for a competitive price. So, this programmatic media buys bidding is best example that explains how AI/ML could be used as to increase market flexibility to serve the customers better and fulfil their needs.

2. Choose the appropriate message- Since people react in different way across different channels and with different messages. Also, two consumers may react differently to a same message across a same channel. AI/ML could help in building a customer profile by based on tracking what type of messages to a particular consumer respond. Generally based on the customer profile companies in movie streaming world tries to redefine artwork of video and tries to attract more viewers. Overall aim of such type of marketing is to increase the conversion rate.

3. **Granular Personalization-** Customer expects now has reached to a higher level as compared to earlier. Since the competition is high in every filed, many companies compete together. So, to have better market share, personalization has become a new strategic tool. Because of AI companies' strategies are not based only on demographic structure but every single individual unique customers preferences and choices. So because of AI personalization is possible on granular level. For example, Spotify has come ahead of all music streaming services by providing personalization on granular level using AI. Their recommendation is not only backed by user past listening data but hit across current genre and about the music people are currently talking.

4. Predictive Marketing Analytics- AI is helping marketing teams with predictive analytics, that helps team understands that what type of product consumer prefers and when, so it carries a great significance in position campaigns.

Amazon is one of the examples considered using predictive analysis for suggesting products to customer based on their purchasing patterns and customer satisfaction. AI could also be used to help marketing people track attribution more precisely, allowing companies to see which promotions have contributed to ROI the most.

5. Marketing Operations- AI also helps in enhancing the efficiency around the various processes.

6.Dynamic Pricing- AI based technologies can suggest optimal prices based competitive and historical data. Using dynamic pricing, companies can react in real-time demand and could lift their sales and could provide competitive advantage over rivals.

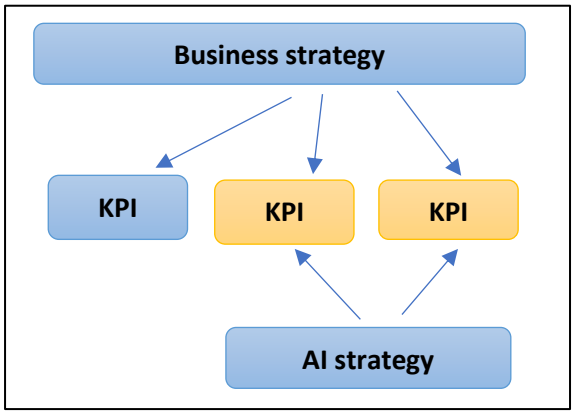
7. Conversational experiences through chatbots- As we have seen above in report that chatbot saves a lot of time of employees and handles conversation effectively and could also adjust its tone according to users' tone. These saves time and cost both.

Designing & implementing AI strategy

The simulation of an AI strategy varies from the creation of a conventional business strategy. Existence of an AI strategy is augmentation for business strategy. The corporate plan or business

strategy determines company's journey ahead. What decision taken would separate a company from other competitors in short as well as in long run. In the form of Key Performance Indicators (KPIs) or Priorities and Key Outcomes, a business plan is articulated by measurable targets, such as (OKRs) objectives of key results. If we can explain it in terms of figure it could be shown like this.

Fig- AI strategy supports business in achieving its KPI.



Source: towardsdatascience.com/secret-to-AI-strategy

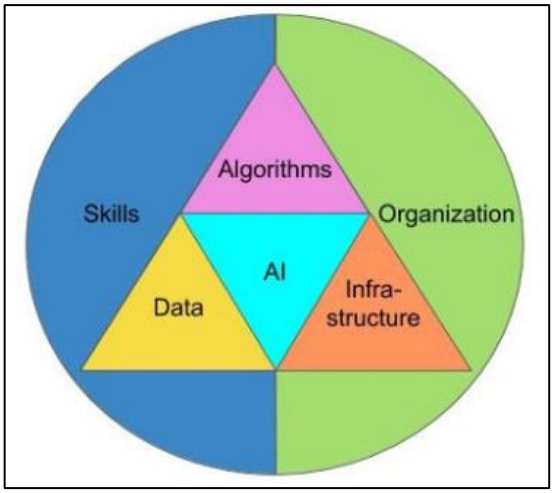
Designing AI strategy-based model.

There is no one-size fit for all AI strategy exist in businesses, still few elements that could be considered as common element while designing the framework. And these models may look different, but they all share a common goal. Sharing elements across all framework of AI strategical based model contains infrastructure, algorithms, surrounded by expertise and organizational foundations. Let's take a closer look into all the components of model.

1. Data: This is first and foremost important component of any AI based strategic framework. It consists of all the relevant data that helps to make an informed decision. While collecting data these two points should be considered first:

- Data that can be acquired by you strategically.
- Is there a need to collect all the data or selected data?

Fig: **AI strategy core components**



In acquiring the data, timing of data acquisition also matters. Not only startups but a well-established corporate may also fails while gathering data. Any model creation that is considered before gathering of data, waste significant resources, and generally committed by start-ups. In the same fashion, corporate which acquires startups because of reason that the startups are known for their huge collection of data, may not be able to find any reasonable value in it. Such type of behavior is generally seen in health care industry, as businesses hope that in random data, algorithms will find a pattern.

2. Infrastructure: The second step is to think about infrastructure after building the data strategy. Infrastructure includes making the data available and supplying the required processing resources needed to process the data. As AI model needs high computing power, so a better infrastructure is needed to implement AI model. This infrastructure should according to the company's need. Here two points need to be answered:

- Is it possible to build unified data warehouse?
- Whether there should be use of cloud services or on-premises solution?

Here the second question is most important, whether to go with services provided by the cloud platforms or build the own infrastructure. Though the cloud vendors provide out of the box solutions and using cloud company must pay for what is needed. Plenty of resources is available on cloud to perform heavy task without much installation. Hence saving both time as well as the cost. Though the cloud-based approach may be feasible in short run but in long run, investing in your own hardware might pay off. By analysing all the merits and demerits, and considering organization's need, one should choose one option out of two.

3. Algorithms: After knowing the task of hardware, next step is to think about algorithmic part. This part carries a whole lot of significance and should be well designed to have a well working model and have a competitive advantage. To design it well, answers of two questions must be considered:

- Do proprietary algorithms mainly define the business value?
- Keeping your model as open-source or keep them as proprietary?

When releasing public data sets and templates that can be reused, the AI community has become much stronger. It could provide advantages to the organizations, because now a days there is access to different types of *AI Model Zoo*.

Model Zoo is a popular way for open-source frameworks and businesses to coordinate their models of machine learning and deep learning techniques.

In your AI Strategy, the key question you can answer is whether algorithms are the main business engine for AI functions. If the answer to previous line is yes, patenting the program is good option. Mechanism should be established to give incentive to employees to file patents. But if the answer is no, then open-source model should be considered and then crowd knowledge could be used for improving the algorithm.

Next step is skills to identify which are needed to carry out AI strategy.

4. Skills: People are at the core of putting data, infrastructure, and algorithms to work to create business value. To encourage people in your business to AI, is next step. The questions need to answer here is:

- Whether there is need to build in-house team or outsourcing task is necessary.
- Other problem is teaching the management and staff about AI.

For latter point many experts believe in making an in-house team. As outside company may not be familiar with the data you use, infrastructure you have etc.

So, going by the option of in-house team, there is need to be building a program that should focuses on continuously educating to people in organization, that how AI could be leveraged. Of all things, it is most important to educate managers regarding AI.

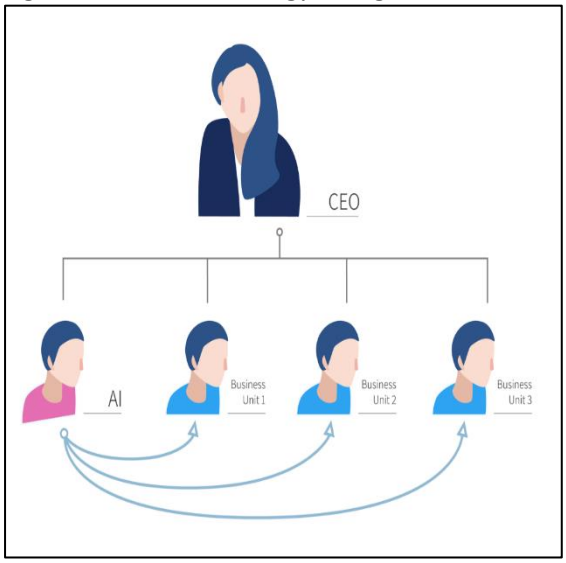
5.Organizations- Preparing your organizations for AI is crucial step. Reviewing the organizational architecture and the processes of growth in particular is important. Important points need to be considered here are:

- To enable your AI team to provide business value through domains and team and the way it would be achieved.

- Are processes defined by your organization are ready for ML based workflow?

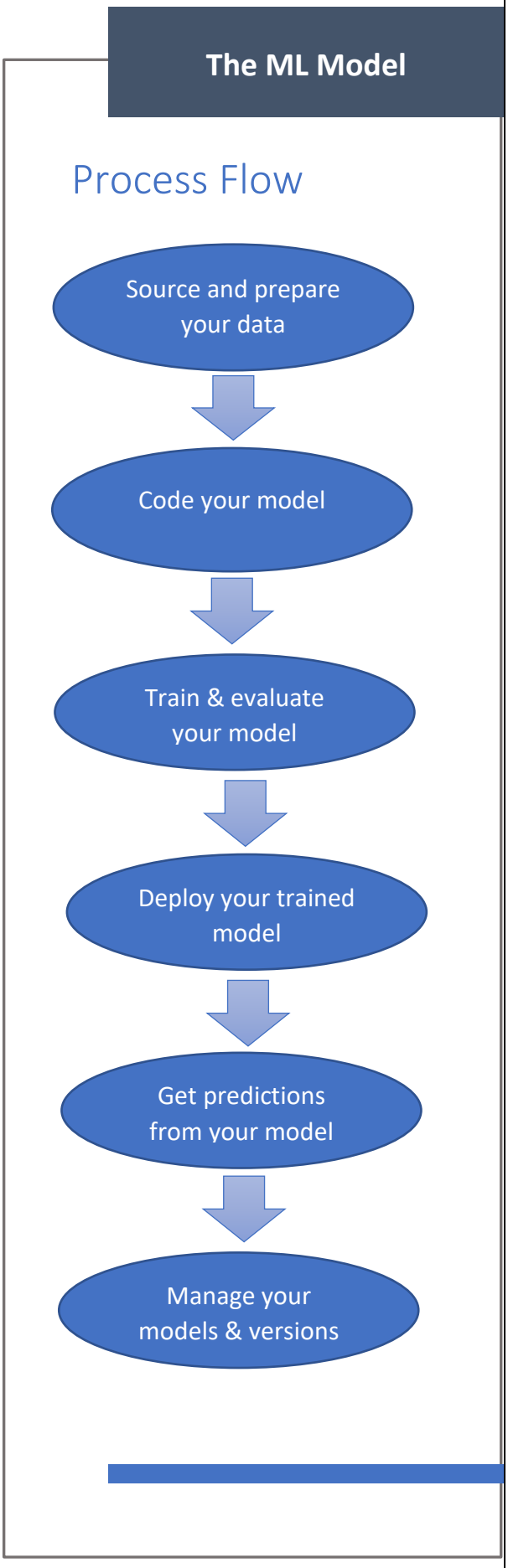
Instead of operating in vertical business units based on customers, AI be the company's horizontal enabler. AI is very much powerful to redefine the internal processes, as we seen earlier that could be used as in Ansoff matrix, to create new product or could be used to improve the existing product. Experts suggest a separate team or unit to which is responsible for communicating the whole AI based communication to whole organization. This separate team or unit would be central enabling better coordination between existing department to have a better ML workflow. This could be depicted as follows.

Fig- ML workflow strategy in organization



Source: towardsdatascience.com/secret-to-AI-strategy

To become an AI based company it is necessary to have a good understanding of ML workflow. All the guidelines should be made by keeping this is mind. So, it is necessary to understand this.



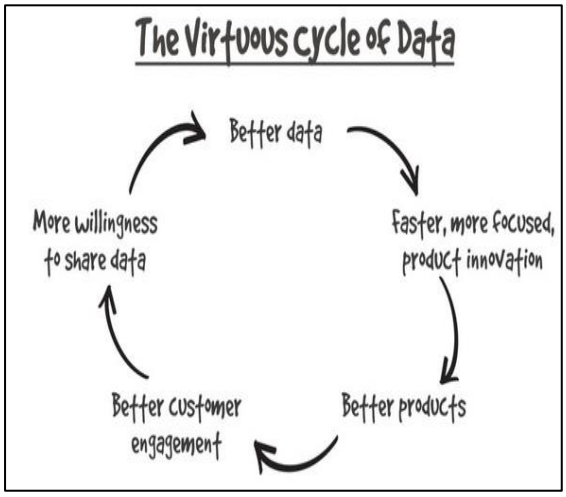
Business development processes must be aligned with ML workflow processes.

Overall, it is a team effort to build an AI strategy. People should have diverse perspectives. Here, between startups and companies, the team mix varies. Generally, in startups, smaller team is there, and they are dependent on technical feedback from data engineer and for business feedback, business developer or product owner. To make a strategy successful, AI strategies should be impact driven, have a good support from management and employees. Focusing on technology over impact may result in output of strategy as a failure.

Implementation of AI strategy in startups

Way of creating an AI based strategy is different from startups and corporate. Startups should have aim to enter in AI virtuous cycle.

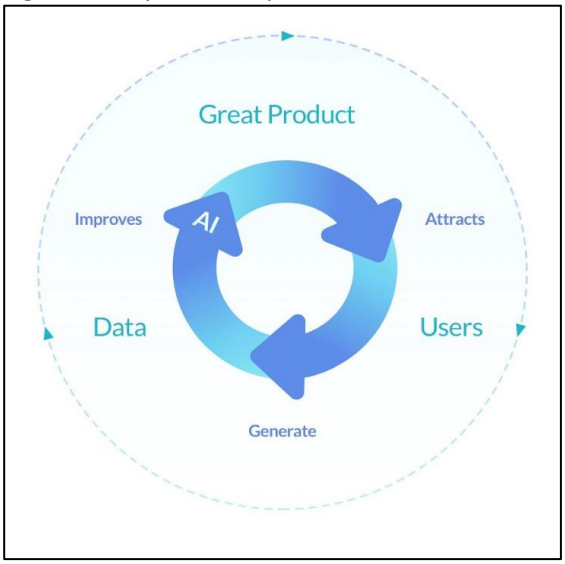
Fig- Virtuous cycle of data. Desrable for startups



Source: towardsdatascience.com/secret-to-AI-strategy

Initially startups should focus on better customer interaction, so then with the help of AI, product could be improved and then could be used to attract more customer. AI entrepreneurs are on a road to success once they have joined the virtuous cycle of AI. This could be shown through following figure.

Fig- AI to improve the products.



Source: towardsdatascience.com/secret-to-AI-strategy

Building AI strategy based on AI project canvas.

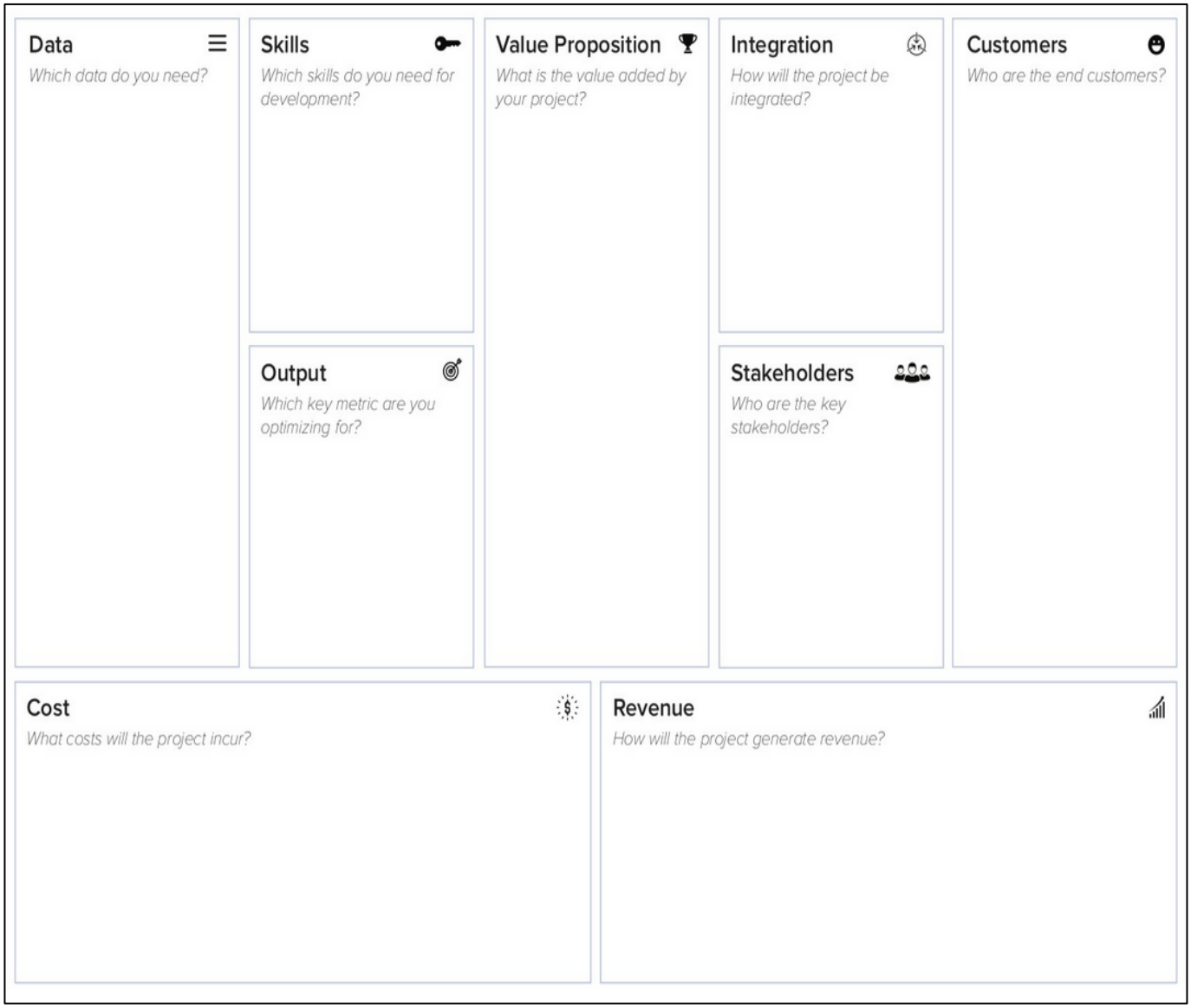
This AI project canvas is derived from business model canvas given by Alexander Osterwalder in 2008. This AI based canvas model is a great way to present your idea along with necessary factors in only one page and could be easily used by stakeholders and shareholders to understand the AI based project of your organization. At the root of any effective AI project is the prototyping of a solution and iteration before achieving the main metric. AI business model helps in defines the outcome and could tell about resources needed to achieve the project.

This project canvas has four parts.

- Value proposition
- Ingredients
- Integration for customers
- Financing

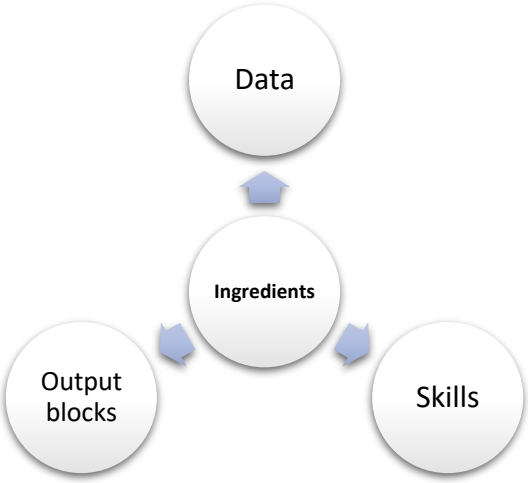
Figure of model is given below

AI Project Canvas



1. <u>Value proposition</u>: It is the main part of business project canvas. This part is responsible for explaining the value that would be added to the project to your organization. This value addition could be in form of development of new product or to cut the cost of existing processes. Idea here is to answer the question that which pain point of the customer you are solving. These points could be summarized through bullet points. But points should be limited, because trying to solve too many problems through one project, may jeopardize the main idea. And that is not any organization want.

2. <u>Ingredients:</u> Ingredients part consist of:



As discussed, earlier data is the main ingredient for any AI project. And also, above we have already talked about the necessary part of it like what kind of data is needed, its source, labelling etc.

Skills parts consist of expertise that is needed. Is there any need of data scientists? The process design workflow that is needed. The relationship needs to require between AI team and higher management etc.

The output block is responsible for showing the main metric you are testing on. It would help in not only choosing good model in beginning but also to compare different models which are based on the same metric.

Next part is bringing the AI project to the customer.

3. **Integration for customers:** This part helps in integrating current infrastructure, stakeholders, and customers. AI projects needs to be incorporated into the existing design. Defining that how customer will engage with your AI model. Another major aspect of this part is to define a list of key stakeholders. It will provide a great overview of crucial decision makers. Here crucial stakeholders could be internal stakeholders like management or legal team, and external stakeholders could be like non-profit groups or contractors.

In the right most block, customer comes in. It is often seen that technologists like data scientists too much care about model and forgets about the end customer, for whom it is all about. Customers care about faster response and inference than improving accuracy by minimal percentage. Model designer should keep this into the mind. Make a detailed list about segmented customers across the process, to guide your decision-making.

4. Financing: The last part is to consider the financing. To have a strong financing analysis, all the part of cost and revenue should be considered. It will also help in explaining the funding of the project.

Cost block here would list down all the possible factors that would cost to the company. Similarly, revenue block would let you know that how AI project would help the company grow by generating the money. The one point should be considered here is that whether the project need to be sold as a service or something in different manner. Also, whether, the project would help in reducing the cost by automating some processes or will create something innovative. It is a significant part of every AI project to mention the revenue form.

Implement AI model canvas in real world scenario.

Here the idea is to make a model for self-driving car. So, going through all the four blocks first part involves what data is required. So, the data here required is ADAS uncompressed or advance data. Skills required are engineering skills, sales expert to increase the conversion rate in the market. Then going into the value proposition part, which may be several. The most important is to build a new transportation of car which can drive on its own, considering the safety of the passengers inside as well as of those on outside. Delivery of project would be done by engineering team who are closely watched by high management team keeping the customer requirements in center. Stakeholders are passengers, insurers, and legal authorities. Then we need to define end customers and source of revenue as well as source of cost to be analyzed to carry the AI project properly. Complete diagram is given below.

AI Project Canvas Title: **Self-driving cars**

Data
Which data do you need?

> Uncompressed ADAS sensor data

> Advanced infotainment/uncompressed ADAS data

> In-vehicle networks

Skills
Which skills do you need for development?

> Engineering skills

> Sales expert

> Computer Vision

Output
Which key metric are you optimizing for?

> Maximum reliability so that people drive most of the time in autopilot mode.

Value Proposition
What is the value added by your project?

> To build new transport using self-driving car.

> To increase the reliability and safety of passenger through ensuring proper safety mechanism.

> Technology that drives new age of mobility.

Integration
How will the project be integrated?

> Project will be integrated through engineers closely watched by management and keeping the customer requirement at center.

Stakeholders
Who are the key stakeholders?

> Passengers

> Insurers

> Legislators & regulators

Customers
Who are the end customers?

> People who want to drive from point A to point B without driving themselves.

> People with no car.

> Passengers who want to travel alone.

> Passenger who are working on their journey.

> People who are interested in self-driving car.

Cost
What costs will the project incur?

> LIDAR technology

> Navigation technology

> Highly skilled engineer

> Autonomous car technology

> Other necessary parts

Revenue
How will the project generate revenue?

> Sale of cars

> By upgradation of self-driving software

> Transportation as a service

> Licensing

Results & findings

AI based strategy are providing a new approach for companies to compete in the market. These strategies are based on some frameworks, which may share some common elements like data, infrastructure, and organizations. To implement AI strategy better organizations needs to follow decentralized and cross-functional teams. New roles have been created in organizations to carry out process smoothly and faster. AI based strategy as discussed is applicable in every field but their way of using may vary. For example, in healthcare industry, its aim should be in reduction of time. Similarly, in marketing the aim would be to increase the customer retention and at the same time keep acquiring the new customers. Strategies are based on KPIs & metrics. First step of any AI based strategy is to link it to the goal and then define a value proposition that would attract your customers. However, implementing strategy in start-ups company might differ from those of established corporates. Aim of any start-ups should be to get into virtuous cycle of data. And to implement the strategy any appropriate model could be chosen. Models might differ according to field but some common elements in AI models include data, value propositions, skill required to carry out the project, stakeholders involved and cost that would be involved to carry out to make the revenue.

Conclusion

Aim of every company is to make profit. It could be done by two ways. First make more revenue or cut down the cost. AI here helping in implementing strategy of both kinds. New product development through AI technologies is one way of generating more revenue. Similarly, there are some AI framework that focuses in reducing the cost for company.

New frameworks of AI strategies are getting developed according to specific needs of the organization as no one size fits for all here. But key lies in analysing all the factor before implanting the strategy. Data being the most important factor in implementing any strategy.

Organizations are clear with the goals that AI strategy would bring for them. Keeping this goal in mind the value proposition is defined and executed keeping all the necessary factors in mind. Researchers are working very hard to bring new strategical AI framework that is flexible in real time and guarantees faster process, hence making organizations move ahead in this cutthroat business competition.

Glossary:

Keywords	Meaning or definition
LIDAR	LIDAR stands for Light Detection & Ranging. It is a tool for calculating distances by lighting the target with laser light and measure the time it takes the light reflects to travel back to the sensor.
ADAS	Advanced Driver Assistance System. It is a computer system that assist drivers in driving and parking functions.
Virtuous cycle of data	It represents a cyclic structure that describes better data leads to focused customer interaction, and that leads to product innovation which satisfies the customers and hence they are willing to share more data.
AI strategist	An AI strategist is an IT specialist whose position is concerned with the evolution and implementation of artificial intelligence services and products. The AI strategist must consider creativity and growth, as well as streamlined workflows.
DevOps	DevOps is a group of activities that incorporate software development (Dev) and IT operations (Ops)..It intends to trim down the life cycle of systems development and ensure continuous delivery of high quality software..
Computer Vision	It is a scientific research field that deals with how machines can obtain high-level understanding from digital videos and images. From the point of view of engineering, it aims to understand and automate the functions that the human visual system can perform.
Pixel labelling	In such labelling, a class label from a predefined set is assigned to each pixel in an image (such as grass, tree, road, car, and person) the presumption is that each pixel belongs to a particular category of interest and that category can be clearly defined.
Value innovation	Value Innovation is a simultaneous search of differentiation and low pricing, producing a jump of value for both consumers and businesses. It is the cornerstone of any marketing strategy.
Auto-pilot miles	Miles covered in self-driving mode in autonomous cars.
Deep learning	Deep learning is an AI feature that imitates the functioning of the human brain to process data for object detection, language recognition, and decision making.

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