ARTIFICIAL INTELLIGENCE IN TRAVEL INDUSTRY

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Abstract:

The purpose of the present article is to highlight the role of Artificial Intelligence (AI) and Robotics in the tourism industry. The various technologies being integrated to improve the service and customer experience in tourism. The expected changes and challenges in tourism in the future are focused in this paper.

Problem Statement:

The rise of internet technologies and services in the past 15 years has significantly changed the travel industry. Throughout the years, only a few companies have established a monopolistic position in this trillion-dollar market. They created elaborated ecosystems that are centralized and have moved away from the most important aspects of the ecosystem — the value of host and guest. Some online travel agencies do not stand out because they fail to provide an adequate facility description since there is no option to highlight interesting or unique details of their offering. This centralized and rehashed approach leads to monotone content and prevents the industry from evolving. The main challenges of Service Providers, such as accommodations, travel activities, transports, and events in the travel industry. Challenges of Technology providers — channel managers, property management systems, revenue management systems, booking engines.

Market Need Assessment:

With new technologies and applications becoming essential parts of consumer behaviour, tourism businesses also need to respond to this change. The consumers is now becoming the central focus of travel – the consumer is king but with the focus on the individual! This is a new concept for many in tourism. Tourism businesses need to make every holiday or experience with a tourism brand highly personalised and unique in every sense. Consumers' expectations are therefore at the core and businesses aim to understand the complex mind of travellers and their reaction towards social media and technology. The tourism industry now has to focus heavily on ensuring consumers' desires can be decoded and understood.

Market Segmentation and Market Target:

The recognition that consumers have different needs, wants, resources, preferences and purchase behaviours led marketing to move away from mass marketing and embrace target marketing. Market segmentation has become one of the main practices in marketing that assists in identifying distinct groups of consumers. These groups have similar needs, wants, attitudes, shopping habits, media usage, price sensitivity and other characteristics. The goal of segmentation is to identify homogeneous groups of consumers in order to satisfy their needs, desires and preferences more specifically than a mass marketing strategy could do while at the same time increasing marketing efficiency and effectiveness. Market targeting step involves the evaluation of

market segments and the selection of target market segments. When evaluating various market segments, firms should examine the market segment size (e.g. number of consumers), growth (e.g. sales and expected profitability) and structural attractiveness (e.g. competitors, suppliers, substitute products and buyers' power) of each segment while taking into account their resources and strategic goals. These evaluation criteria assist companies in deciding the number and which segments they can better and/or most profitably serve.

External Search:

https://neptune.ai/blog/how-ai-and-ml-can-solve-business-problems-in-tourism-organization-chatbots-recommendation-systems-and-sentiment-analysis

https://towardsdatascience.com/how-machine-learning-and-ai-can-improve-travel-services-3fc8a88664c4

https://www.iotforall.com/machine-learning-and-ai-in-travel-5-essential-industry-use-cases

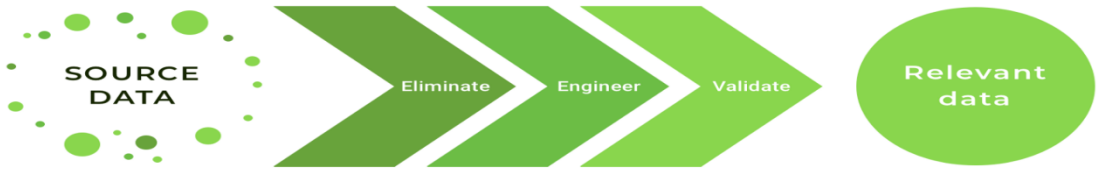
Concept Generation:

It's getting harder to find a success story of how travel company X made technology improvement Y that increased sales by Z% without spotting the words "machine learning" or "artificial intelligence". Sometimes used interchangeably, these two notions actually have different meanings. Artificial Intelligence is a vast area of computer science that studies how to teach computers to think and act like a human. Machine Learning is a subset of AI, important, but not the only one. In a nutshell, Machine Learning is about building models that predict the result with the high accuracy on the basis of the input data. Using statistical methods, it enables machines to improve their accuracy as more data is fed in the system.

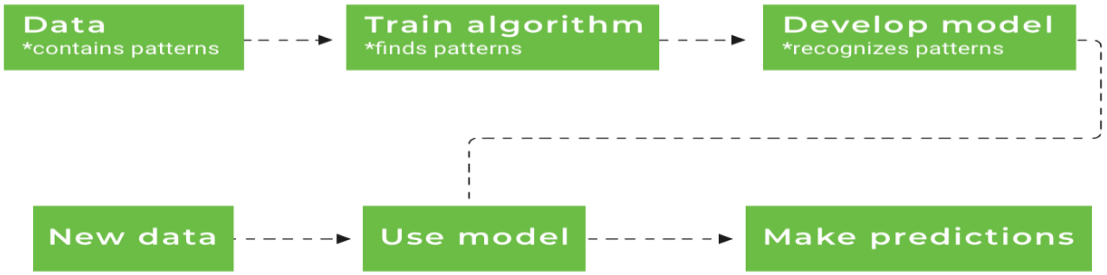
The final output of machine learning models depends on the:

1. Quality of the data: The more data is diverse and rich, the better the machine can find patterns and the more precise the result. The datasets of good quality are usually in very high demand and the companies sometimes literally have to hunt for the decent datasets.

2. Features are meaningful inputs that the existing data contains, like user gender / location / browser extension etc. Usually data has more information that is needed to build the model, so it is necessary to select the important features. During this process, either the analyst or modeling tool selects or discards the attributes depending on how useful they are for analysis



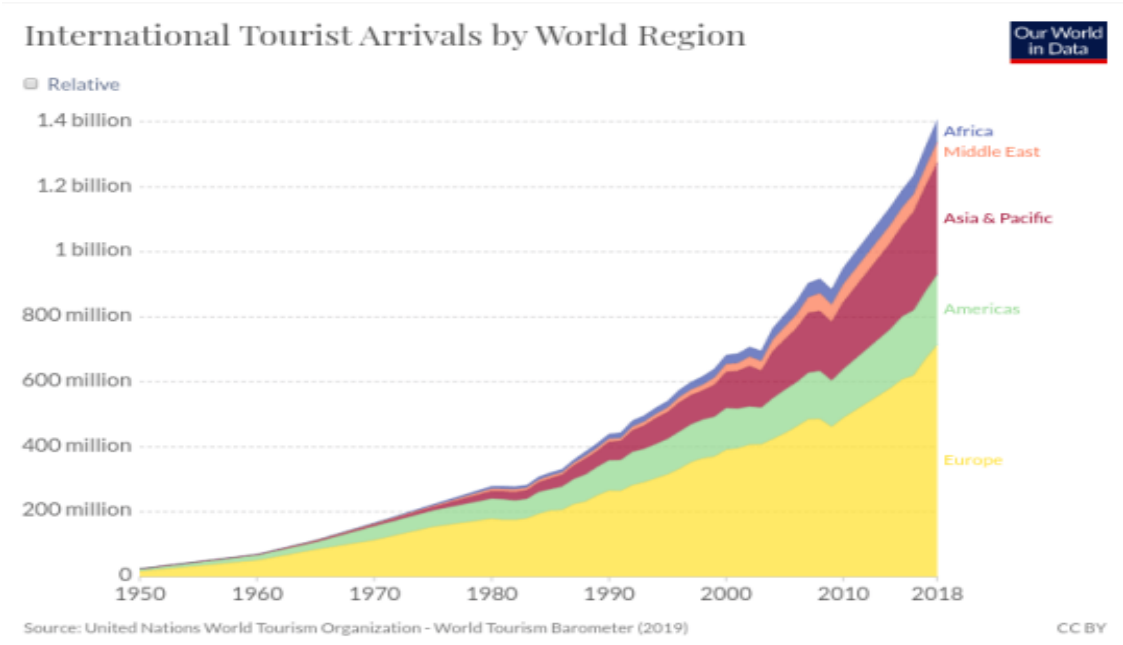
3. **Algorithm** that analyzes the data looks for patterns or trends and then finds the optimal parameters for creating the model. It's quite a challenge to choose the best algorithm to solve a specific task as each algorithm can generate a different result and some of them generate more than one kind of result. Here's how Machine-Learning-powered model is built:



Machine learning model can outperform classical rigid business intelligence where business rules cannot capture the hidden patterns. Travel companies are actively implementing AI & ML to dig deep in the available data and optimize the flow on their websites and apps, and deliver truly superior experiences.

AI in Travel Industry:

Tourism has enjoyed massive growth over the years, as people seek to spend time away from home in pursuit of recreation, relaxation, and pleasure. At least before COVID times, tourism has been a fast-growing sector that plays a big role in the global economy. According to the United Nations World Tourism Organization, there were an estimated 25 million international arrivals in 1950. 68 years later, it grew to about 1.4 billion international arrivals, an approximately 56 fold increase. According to Statista, travel, and tourism directly contributed around $2.9 trillion in 2019 to the global economy.

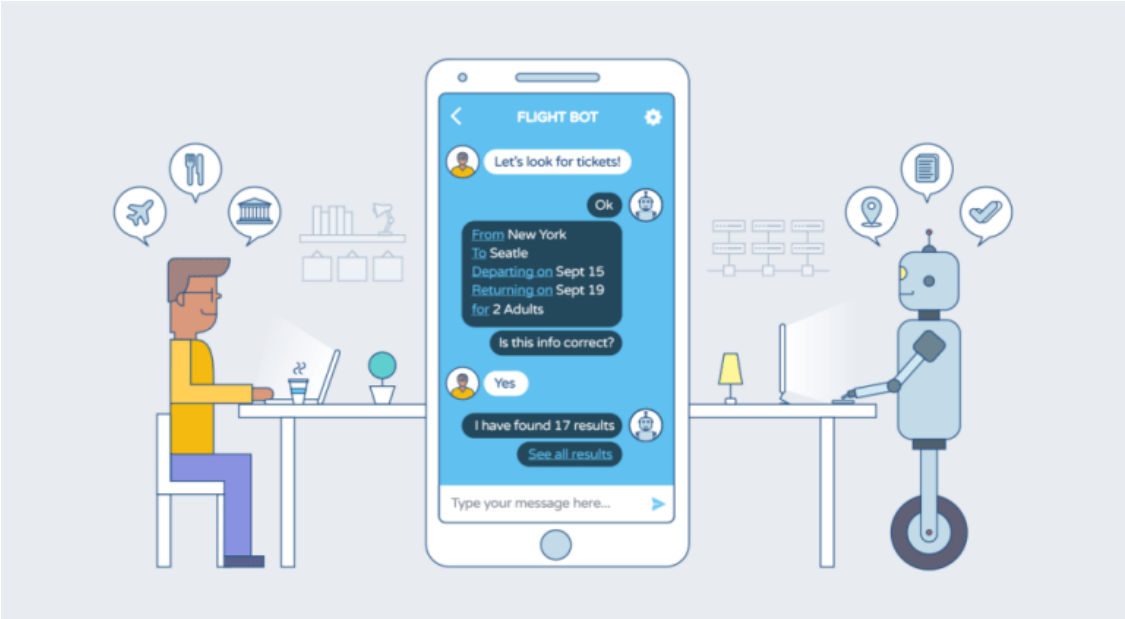


Modern technologies make travelling easy. You can book flights and hotels in mobile apps, easily find restaurants and entertainment, and pay for everything online. This also means that a lot of data is generated all the time from mobile devices. Industries leverage this through Big Data solutions to improve services and make things easier for consumers. Apart from just analyzing this data to find consumer patterns, machine learning and AI is used to predict future outcomes, which helps to solve issues before they happen. Data has

become the most valuable asset in the world, and a key driver of growth. The impact of machine learning in tourism is heavily geared towards customer satisfaction and engagement.

How can Machine Learning solve problems in tourism? (Concept Development)

1. Chatbots:



Customers today want to stay up to date on information from companies serving them, and need to be able to ask questions and get answers quickly.

Tourism companies used to only be able to hire Front Desk Attendants and Customer Care Representatives. This limited their ability to help customers, and sometimes lead to churn due to bad behaviors of human customer service agents.

With the creation of chatbots, companies started using them as personal assistants for their customers, through existing platforms like web browsers and messenger applications (WhatsApp or Facebook).

Chatbots can answer common questions, recommend places to visit or things to do while touring a city, all very quickly and without the hassle scrolling through a website or waiting to speak to a customer service agent.

Chatbot benefits:

- Time saving
- Personalized services
- Very low financial cost for companies,
- Chat can be analysed to understand what customers talk about and plan future improvements.

2. Recommendation Systems:

Recommendation systems are everywhere. They suggest relevant items to users based on different factors and data. Top companies including Netflix, Linkedin, and Amazon utilize the power of recommendation systems to suggest personalized items to users.

The tourism industry is no different. Here, these systems reduce customer churn and transaction costs, and save time for both customers and service providers.

Companies use customer data and machine learning algorithms to build a recommendation model that can accurately suggest the best places to visit without having to manually check catalogs, websites, or reaching out to customer service agents.

These models are built on data like past expenses, travel destinations, ratings, and previously chosen offers.

Recommendation system benefits:

- Quickly provide personalized suggestions,
- Supports precise marketing,
- Facilitates smarter travels for tourists.

3. Social Media Sentiment Analysis:

Social media has become a crucial way of getting reviews from people, and this can affect how new users perceive your company.

Analyzing sentiments, locating trouble spots, and fixing them in tourism companies can help drive growth. Some customers might be dissatisfied with services while others can be delighted, and companies can use this information to their advantage.

How can we analyze these reviews in an automated way to check if they're good or bad?

With sentiment analysis. It uses Natural Language Processing, a sub-field of AI and ML that automates the process of examining relationships and meaning in reviews from customers.

Benefits of Social Media Sentiment Analysis:

- Provides an efficient performance indicator
- Helps to understand customers
- Helps measure results of marketing campaigns.

4. Targeting the right audience:

Understanding clients and knowing what to market to which customer has proved to be a very effective strategy for marketing.

Clients have different characteristics, live in different locations, work different jobs, earn different salaries. In tourism, some customers might afford that luxurious Santorini vacation while some might not, and marketing it to the wrong class of clients can only increase marketing spending without yielding any results.

Manually predicting client behavior and segmenting can be a burden. With thousands of data points generated daily, only machines can do this efficiently.

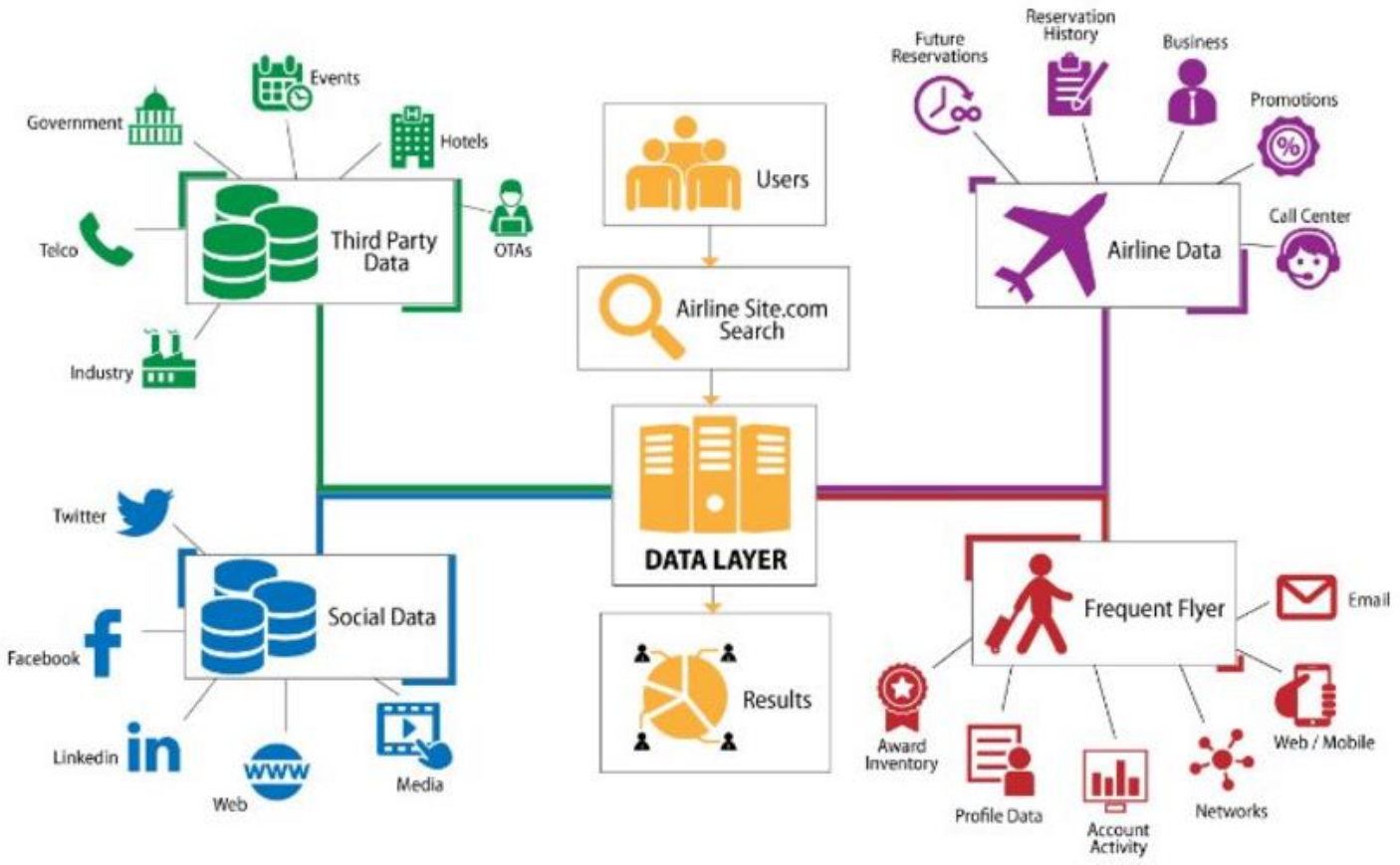
How can machine learning help target marketing in the tourism industry?

Machine learning can help identify segments of clients using clustering algorithms, where clients with similar characteristics are grouped based on features like travel frequency, duration of stay, amount spent, and so on.
Machine learning can also help predict client behavior and avoid clients with a high probability of not engaging in a tourism offer.

Benefits of targeting the right audience:

- Better Recommendations
- Increased Conversions
- Better and more fruitful ad campaigns.

Schematic Diagram of Final Product:



Conclusion:

In this article, we have discussed some popular applications of AI and how they operate. As discussed, be it by air or sea, there are potential ways passengers and travel companies can utilize AI to make the journey an efficient and smooth one while maintaining customer satisfaction at a higher level.

With every passing day, the presence of Artificial intelligence in the tourism scene is increasing. Due to the widening application of innovative technology, it is expected that the tourism industry will reach unimaginable heights in the future. As per a recent research study, the global travel technology market, which encompasses Artificial Intelligence, is expected to grow by more than 9 per cent during the period 2010 and 2023. One of the main factors for the expected growth is the prosperous performance of the travel and tourism industry. But the application of innovative and novel technologies such as Artificial Intelligence, and Machine Learning will bring about significant changes at the industrial level. The technological factors can mold the industry landscape and the processes that are conducted by tourism businesses.

Even though the application of Artificial Intelligence technology will give rise to many benefits at the industry level, the organizational level as well as the customer level, it can also give rise to numerous challenges and

complexities. For instance, introducing different types of AI in the business context of the tourism industry would not be an easy job. Business undertakings would need adequate financial resources to build a secure and robust technical infrastructure. The increase in the use of robots, chatbots, and other AI technologies would mean that the actual human interaction would be restricted in the tourism industry. This could have an adverse implication on the traveling and tourism experience of the end-users. The technology-driven approach could give rise to new, complex, and challenging technical issues that are not yet known. The marketers operating in the tourism industry would have to integrate technology seamlessly so that the technology would be easy to use, and at the same time, it would be beneficial for all the stakeholders. Such a process could be quite lengthy as the Artificial Intelligence technology is still in an early stage.

The Artificial Intelligence concept is quite new and very powerful. There is a need to carry out more research studies on the AI concept as well as its application in the industrial tourism setting. Additional studies will shed light on the complexities that might arise before business undertakings in the tourism industry due to the application of AI technology (Dirican, 2015). Many technical experts have been skeptical of AI such as Stephen Hawking. So it is necessary to carry out a holistic assessment if the new and unique form of technology as its implications would be severe. The concept of robotics and Artificial Intelligence could have a direct impact on the human factors that are currently functioning in the industry. Thus there is a need to conduct comprehensive research studies on AI in tourism so that the overall implication of the technology can be critically assessed. It will help to capture the positive as well as the negative impact on the technology on the industry, the businesses, and the customers.