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Anticipative Cognition

and its Impact on Personalization
in Business

Executive Summary

Human- machine interaction is a key area of interest in the IT world for the last few years. Now, Computers that could learn, think and function like human brains are far more a reality than exaggerations in the science fictions, thanks to the advancements in [Cognitive Computing](#). From the traditional preprogrammed machines, Cognitive computing shows a huge leap in the field of computing. It revolutionizes the way in which machines interact with humans and vice versa. How these Cognitive systems, which possess anticipation capabilities are poised to transform the way we do business is an interesting area to ponder.



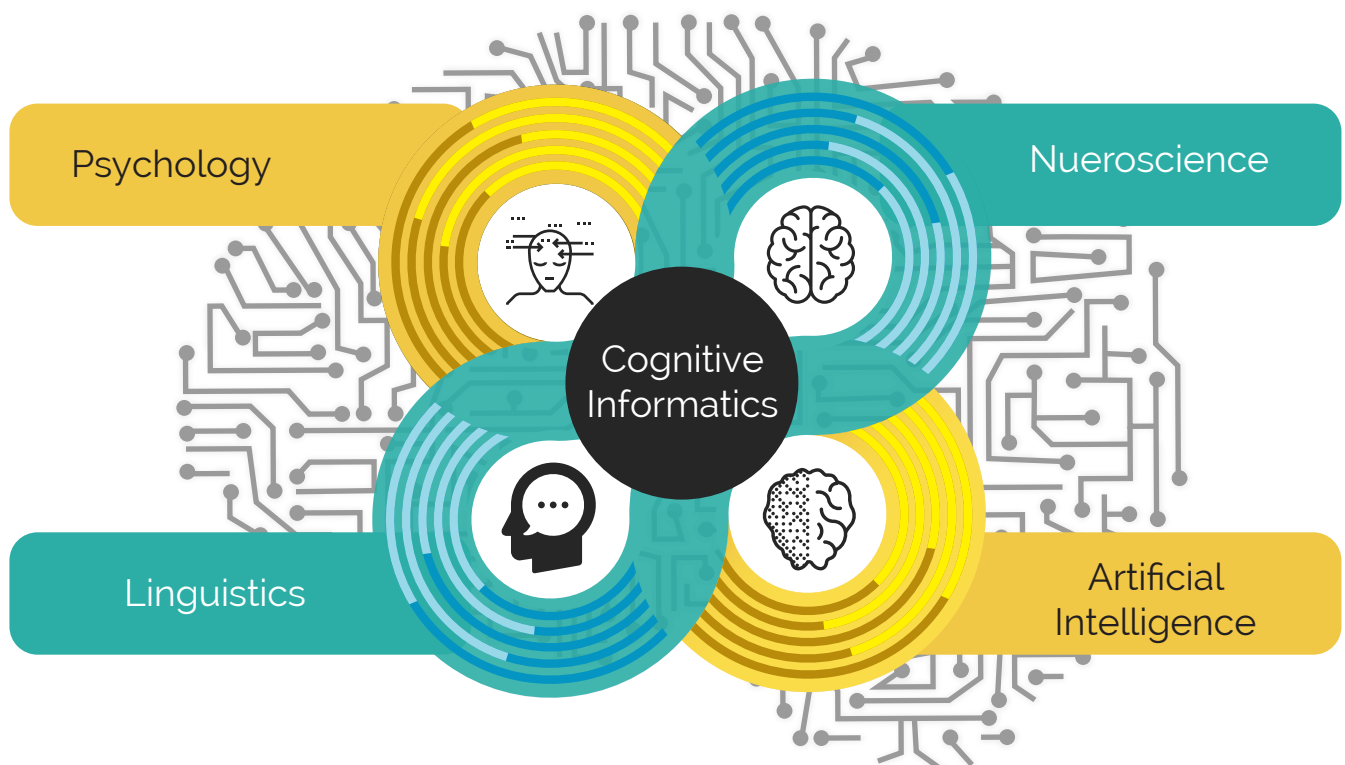
Personalization powered by Traditional Analytics – **Where it stops?**

We are stepping into a new era of cognitive computing, due to the emergence of virtual agents and bots. With the advancements in the cognitive computing field, several capabilities and features which are being carried out manually can now be handled with minimum human intervention. Imagine today's Retail world where 'Point of Sales' (POS) plays a very key role in customer decision. A Chat bot or a Virtual Assistant powered by **predictive analytics** can replace a store representative for guiding a customer to the appropriate product. This is done based on customer data, especially his/her previous transactions and system based persona, captured across omni channels. These actions are mostly achieved by predictive analytics, taking into account the history of actions and modelling them accordingly to take a proper decision in a certain environment. However, in a digitally driven world, the challenge still lie in anticipating a given person's decision- making capability and fine tuning the model accordingly.



Cognitive Anticipation – **What exactly it is?**

Let's think of roaming in a room packed with wooden furniture during daylight. It can be easily achieved as the human visualization sensor- the eye, takes decisions about what to avoid and how to avoid. This is realized by the brain based on our prior experience. If we enter the same room in the dark, our visualization sensor will be in de-function mode and we need to take help of a very important factor, Anticipation, to roam around in the same room. By anticipating possible obstacles our brain will derive a new map or a new way to ease our movement. The concept of anticipation in Artificial Intelligence is becoming very relevant in the modern context of science with the evolvement of predictive analytics, which is not only generation of information about the present but also about the future. Let's go back to the example of POS from an 'anticipative cognitive' point of view. Imagine the same customer visits a different store for the first time. As no prior information about the person is available, the same Chat bot will not be able to provide any suggestions. However, if the bot is powered with the capability of anticipation, it can read and understand a person's facial expressions and gestures against some basic questions and it's possible for the bot to come up with suggestions and recommendations for the customer.



Key Components of Cognitive Anticipation

– How does it work?

The 'anticipation in [artificial intelligence](#)' predicts the future not only based on historical data but also taking into account the behavior, gesture, gait and other biometric traits. It can represent the data and correct it based on the feedback. Together with predictive analytics, 'anticipation' forms the backbone of a future Cognitive Computing which can be termed as Anticipative Cognitive Computing. According to the standard definition of anticipatory systems- anticipation is based on a predictive model of the system and its environment. The question is, how an anticipative cognitive engine will look like?

Let's explain this with the context of living beings. Imagine a player in soccer field very near to a goalpost. The moment he shoots the ball, the goal keeper dives in to the direction of the ball to save it. It's a reactive action. Now imagine the same situation during the penalty shoot-out. The goal keeper dive in to a direction by anticipating the player's foot movement, eye movement and prior information about the player. This is a true instance of anticipation. Cognitive systems are not very reactive in nature but are anticipative and predictive along with behavioral traits. From an anticipative cognitive computing point of view, these behavioral traits can be ingested from _____



Gesture



Emotion



Curiosity



Face Recognition



Social Network

An important aspect of the cognitive system is that it should be adaptable to a new environment and to a new behavior. One way to make cognitive systems adaptable is through predictive machine learning and self-learning capabilities using current data. However, this is good for a certain environment with certain conditions. Adaptability can be enhanced only through anticipatory learning on behavioral aspects like action, emotion, reasoning and others. This special area of machine learning which is inspired by behavioral aspects is known as **Reinforcement learning**.

Anticipative Cognition: Industry Perspective

According to a research report from Markets and Markets, the Cognitive Computing Market is expected to grow from \$2,510.4 Million in 2014 to \$12,550.2 Million by 2019. This represents a Compound Annual Growth Rate (CAGR) of 38.0% from 2014 to 2019. The potential of Cognitive computing to transform industries around the globe is huge. The Cognitive systems with the capabilities to learn, build knowledge, understand and process natural language, and interact more naturally with humans will possibly make a difference in the aspect of personalization especially in the field of retail, travel, banking, healthcare and so on. Let us have a look on this.

In retail, Cognitive systems can be designed to better personalize and target consumers with the right marketing strategies and products providing a much more immersive, life like experience and instant gratification for the customers. In travel industry, cognitive systems can redefine the aspect of travel planning by replicating how the human brain works on a travel plan and deliver contextually relevant, highly personalized advice and insights for customers from planning till completion. In a sector like healthcare, which generates a humungous amount of data, the Cognitive computing capabilities like natural language processing, machine learning and interpretation, evaluation and hypothesis generation can drastically improve the way it functions currently. It is not too far when humans with the help of anticipative cognitive systems will diagnose potential diseases way before they strike human bodies. In the banking sector, with cognitive systems, customers can get quick personalized services and can also reduce human assistance drastically in carrying out the banking activities. Anticipative cognition systems can be utilized for fraud and anomalies detection as well in the banking.

Moving Forward >>>>

Hence, like living organisms, anticipatory cognitive systems need to be made learned/ updated with knowledge about themselves and the outside world. The systems will then be able to predict future, anticipate actions and take corrective and necessary decisions. In the real world, with an increasing application of virtual agents and bots, which currently depends mostly on predictive analytics, anticipatory learning will eventually become a core component of such systems.

Evolution of Analytics



Happiest Minds' play in the field of Anticipative Cognitive Personalization- mCaaS

In Happiest Minds, our Digital Knowledge Broker aka [mCaaS](#) a SaaS based digital content brokering platform caters to the needs of diverse enterprises across multiple industries and domains. The platform aims at leveraging its organic Cognitive Anticipation capabilities to truly personalize an end user experience. The mCaaS platform allows companies to deliver, manage and monetize their content like documents, social data, audio, video, images, etc. as per the user context. This allows smart, seamless and connected delivery of content flow for the enterprise, their end consumers, employees and business partners. mCaaS is offered as a Software as a Service (SaaS) based solution.. We have found very relevant scenarios in Retail, Retail Banking and Travel, to start with.

Use Cases

1 Cognitive and AI powered Virtual Agent (ChatBot) with Speech to Text Capability

The AI powered 'ChatBot' enables to deliver the most Personalized and Context aware chat by analyzing the tone, reaction and emotions of the customer. This significantly boosts the bottom-line performance and brings in proven outcomes like reduced churn, improved customer satisfaction, improved up-sell / cross-sell opportunities and increased agent productivity in any field, especially retail.

2 Insights on User's Content Consumption Patterns

The end user content consumption insights and behavioral patterns derived using the mCaaS solution help in enriching the content and provide enough guidance for the sales process. This helps in optimizing the marketing campaigns thereby enabling the business to achieve the highest degree of operational excellence through optimized business efficiency and increased customer retention.

3 Smarter & Intelligent Digital Assistant and Knowledge Management

The content segmentation and dynamic content orchestration with analytics enable the business to generate leads using a dashboard and detailed reports of anonymous user access. This is achieved by precisely monitoring Segmented Research Reporting & Contextual Regulatory Reporting & Rating which in-turn results in improved employee productivity, and reduced cost to serve.

4 Innovative Content Brokering & Monetization

A cloud integration framework to manage images and videos with smart enterprise federated keyword search & smart learning management system enables the business to create a single point of admin- console with advanced image processing and document management capabilities. The bulk upload and download features enable in achieving increased revenue through improved cross-sell/up-sell opportunities.

Authors



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Ayan's primary area of expertise include Cognitive Computing, Computer Vision and Machine Learning. He has extensive experience in building solution related to analytics for Retail, Industrial Automation, Automotive and Aerospace domain with multiple Granted Patents and International Publications.



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Digital Platform Architect
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He brings to his role expertise in understanding and defining Roadmap , Strategy and Architecture of Digital Platform, Cloud, Integration ,SOA &Cognitive Computing His key technical expertise includes Cloud Foundry Implementations, Microservices Architecture, Integration Suites , Various SOA & ESB Products, Cognitive Tools & Techniques, SaaS & Platform Digitization.

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About Happiest Minds Technologies:

Happiest Minds, the Mindful IT Company, applies agile methodologies to enable **digital transformation** for enterprises and technology providers by delivering seamless customer experience, business efficiency and actionable insights. We leverage a spectrum of disruptive technologies such as: **Big Data Analytics**, AI & Cognitive Computing, Internet of Things, Cloud, Security, SDN-NFV, RPA, **Blockchain**, etc. Positioned as "Born Digital . Born Agile", our capabilities spans across product engineering, digital business solutions, infrastructure management and security services. We deliver these services across industry sectors such as retail, consumer packaged goods, edutech, e-commerce, banking, insurance, hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/hospitality.

Headquartered in Bangalore, India; Happiest Minds has operations in USA, UK, The Netherlands, Australia and Middle East.

To know more about our offerings. Please write to us at business@happiestminds.com