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# A Study on Integration of Applied Artificial Intelligence in Accounting, Finance, Insurance, and E-Commerce Sectors

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**Abstract:** Presently the rapid-fire development of information technology and the necessity of economic society, artificial intelligence has been introduced in the golden age. The application of artificial intelligence technology in the accounting field is an inevitable trend, which will bring tremendous changes and development to the accounting industry. The finance sector nowadays is emerging its capability Hence, to a certain extent where the extensive use of statistical data is done, the analysis result of large data set is really required to understand the continuous changes in the financial health of an organization, eventually sectors and after all for the market. This financial data analysis not only require understanding the financial positions and outcomes but also it requires taking action to address the gaps identified by the analysis or to address the upcoming financial need of organizations and the market.

**Keywords:** Capital Flow, Capital Market Sectors, Customer Trending Information, Deep Learning, Insurance Demand, and Trend to Cover the Risk, Market Capital Optimization

## 1. Introduction of Artificial Intelligence in the Finance and E-Commerce Sector

In the finance and sales service industry merely the section where Artificial Intelligence (AI) or machine learning [2] can be used to help huge data analysis and provide optimal resolution can be categorized as "Capital Market Sectors", "Consumer Service" and "Insurance Industry and Services". By analyzing the "Customer Trending Information", "Current Asset and Capital Flow" and "Insurance Demand and Trend to cover the risk", Artificial Intelligence can help to provide optimal "Capital gaining opportunities", Ready to use "Demand addressing Report" of range of Customer and current "Insurance and Risk Management Trend" in market. Artificial Intelligence can also address the most current trends of financial sectors such as "Increasing the risk management requirement and regulation", "implementation of most agile mobile and web-based technology to address the need of e-financing", "Building of future road map of any service wing using deep learning of that particular sector" such as High-Frequency Trading, Fraud Detection in Finance sector and Cyber security, etc. A report from TCS is depicting that the most insurance companies are going to spend around $90 million on Artificial Intelligence by 2020 and the total Artificial Intelligence market revenue will be $59.8 Billion by 2025. Companies from different financial sectors not only concentrate to adopt Artificial Intelligence but also organizations are doing instrumentation changes according to the futuristic analysis and market changes. Many organizations such as "Dreamquark"," Motions Cloud"," Quantenstein" and "Cap Analysis" etc are already developing high-end market suitable financial solutions to support Artificial Intelligence based analysis and "Deep Learning" to address and adopt futuristic changes [1].



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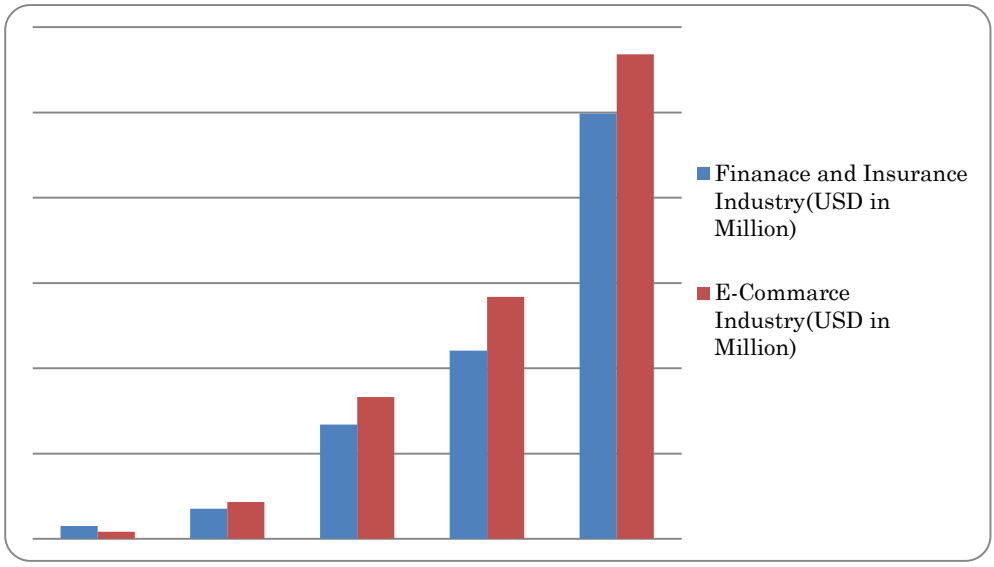


**Fig. 1.** Investment in Artificial Intelligence by Finance and E-Commerce industry

Fig. 1 demonstrates the Investment in Artificial Intelligence by Finance and E-Commerce industry. Currently, the sectors worked upon a few advance features such as the sparse architecture of deep learning which can unveil new patterns in data of financial input. A few more AI giants [3] and [4] are working upon the integration of one app insurance solution to reduce insurance claim cost, claim cycle time, self-service, and improve the accuracy of claim value. Many companies are also working on the integration of Artificial Intelligence in "Market Capital Optimization", "Market Impact Analysis" and "Portfolio Management" which will open a new horizon in the Finance sector for applied Artificial Intelligence [6].

## 2. Integration of Artificial Intelligence in the Different Spare of Financial Services and Service Providing Sectors

Currently, Artificial Intelligence is applying to the discrete processes of Finance, Insurance, and E-Commerce Sectors., it is applied to know the trend of the market, times to analyze the interest area of clients and customers, and many times it is used to find the best pricing and timing of treading of Funds. Merely, it is used to identify AML detection. below there are a few places in the finance and insurance sectors where the modules of Artificial intelligence are applied [5]. Hence all are discrete sections and output is not flowing contiguously from system to system hence it is not impacting much in terms of effort saving, revenue saving, and in most of the cases system is not able to provide optimal integrated output or report instead of discrete accuracy with modular output to an organizational process [8]. Fig. 2 illustrates the systematic diagram of different wings of artificial intelligence.

a) **Capital optimizations for Finance Companies and Institutions:** Capital optimization can be done basically in areas such as "Risk-Weighted Asset"(RWA) and "Market Valuation Adjustment"(MVA). Secondary research suggested that most the banks can achieve 5-15% RWA savings annually. For MVA optimization machine learning can help to reduce the initial margin of derivative by combining the pair of derivative trades and executing the strategies that seem to be offset with the same dealer. In this case, machine learning helps to identify from which dealer the portfolio can be obligated to another dealer.

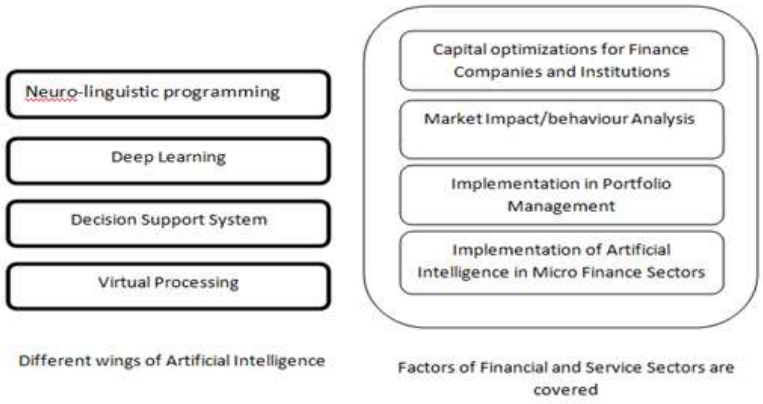


**Fig. 2**. Systematic diagram of different wings of artificial intelligence

In the insurance sector, artificial intelligence can help to integrate machine learning to understand the current trend of the market such as personal insurance, health coverage, Car insurance, etc. The system analyzes the large set of records of past insurance purchase trends, Claim processing data, and of course current market trends with all regulatory acts. Many companies in Europe use to implement sensors to understand the car damage trend which helps them to augment the insurance process by adhering to the regulatory acts. This helps to come up with new product according to market needs, provide alert to the customer about new policies, or helps the customer to get risk-optimal insurance coverage. According to private sector estimates, Insurance technology-related investment totaled $1.7 Billion in 2016 whereas in artificial intelligence the investment was around 30% i.e. $0.51 million.

**b) Market Impact/behavior Analysis:** Market Impact and behavior are essentially important factors in "Asset Management", "Fund Management, and "Bond Management in Financial Companies" because these are highly related to the behaviour of the market. Some factors which can be identified and can be a key influence are as given- i] timing of tread for a bond or particular fund can be influenced by market impact ii] Identify the behaviour of bonds or group of bonds where the price movement is impacted by the market impact.

Nowadays financial organizations are investigating AI tools that can assess such factors by reading past tread records and built a futuristic model to deal with such factors by augmenting all such scenarios in the knowledge base of the model. The model will be reactive enough that it can have a decision support system that can help the organization to take optimal solutions while the market changes identified. AI model also observes the responsibilities to control the timing and process of trade to minimize the tread risk for funds and bonds and ensure the optimal benefit.

**c) Impact of Machine driven solution in Treading Execution:** Machine Learning to influence the conventional trading system by analyzing the past history of trading such as i] Client demand and business goal in scenarios of current market situation ii] Current market condition of the client in terms of benefit, profit, and cash flow along with past records. Each trading is used to generate a large volume of data and hence machine learning comes into the picture. Machine Learning can analyze the factors and past data and create a model which can effectively process the trade with a client by effectively identifying their current and future need in terms of business. The model can help to address the "Pre-Trade" and "Post-Trade" transparency in business Models. For example, in online trading in "Pre-Tread" and "Post -Tread"-the organization helps the third-party seller automatically adjust product price and product genre and helps in demand planning by providing information captured by their artificial intelligence system. In this case, the seller can take a more proactive stance and predict current market competition.

By implying the above factors, Amazon uses customer purchase and search trend, product searching intention, product genre, etc., and provide a suggested range of product to the user doing online shopping. It also provides regular notification about the product user shows interest. This approach has influenced the sales of Amazon in the below trend.

Google constantly integrates AI to promote and trading of its product even. Google has extensively analyzed its customer behaviour in past decades and comes up with the automation in Google Suggest where it got integrated with Gmail to provide rapid replies to emails. Many organization educational

institutions appreciated this approach. "Google Brain" is another massive step toward automation using market behaviour analysis. Many users want to have a suggested video since many of them could not able to provide a proper keyword for search. "Google Brain" suggested related videos by observing each separate word, user behavior, and trend, and by using "Google Brain" the watch time of YouTube has increased by 50% in the last three years.

## 3. Implementation in Portfolio Management

By using machine learning and an adaptive decision support system artificial Intelligence can identify the price movement of funds for a portfolio. In machine learning, the protocol and principles such as regulatory actions can be integrated. Machine learning imposes systematic investigation of the trend of market and fund behaviour. AI consolidated the work base of a large team of fund managers to impose its knowledge base and decision support system. Portfolio management also integrates the large value of information of asset managers to construct such a decision support system.

Implementation of Artificial Intelligence in Micro-Finance Sectors: In Micro-finance sectors Implementation of Machine Learning can help to make the process a bit faster to execute. It also helps the user and institutions to understand the functionalities, the process to be accomplished, and the factors. It also illustrates the formulation of market price along with other factors. "Neuro-linguistic programming"(NLP) is another wing that has been used deeply for surveillance and fraud detection including "Anti-Money Laundering and Countering Financing of Terrorism" AML/CFT detection. "Australian Security and Investment Commission is exploring the capability of NLP by exploring the result provided by the specific system and finding out its potentiality."Paypal has implemented NLP and Deep Learning for its NLP and in 2017 it reported a relatively low fraud case 0.32% of revenue which was 1.32% of revenue in 2016.

## 4. Integration of Different Modules to Provide an Enterprise Solution

Currently, the financial and insurance institutions are using different perhaps discrete Artificial Intelligence modules where the organization ids taking the help of AI in particular processing [7]. But, since the module requires manual interventions, the outcome many times is not lenient with the actual output and hence need human validation as a second layer of processing. Since the entire module does not have the AI-based solution, the integrated outcome is not showing the expected accuracy, especially in the case of the finance industry. A study shows that the 70-80% of process automation by AI where the human intervention will be only as input provider, output carrier, and statistical monitor- the result will be 56% more accurate, and in this way, it can save the effort of each module annually 1200 hrs and increase the revenue by 21-23%. Fig. 3 exhibits the integration of Artificial Intelligence in Finance and E-Commerce Sectors.

- Natural Language Processing (NLP) is a branch of AI) that enables machines to understand human language. The main aim is to build systems that can make sense of the text and automatically carry out tasks like spell check, translation, and topic classification.
- Deep learning is a subset of machine learning, which is essentially a neural network with three or more layers. These neural networks attempt to simulate the behavior of the human brain—albeit far from matching its ability—allowing it to "learn" from large amounts of data.
- AI is the backbone behind effective decision support systems (DCS). A DCS assists facilitate decision-making for a team or business on the basis of the data. AI abilities take that one step further and automate decision-making for companies, also called an expert systems.
- Virtual intelligence is the term given to AI that exists within a virtual world. Numerous virtual worlds have options for persistent avatars that present information, role-playing, training, and social interactions.

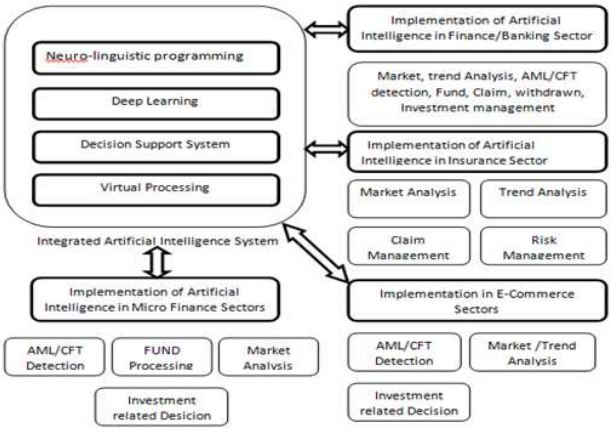


**Fig. 3.** Integration of Artificial Intelligence in Finance and E-Commerce Sectors

## 5. Conclusion

Artificial Intelligence can be an emerging factor in the "Finance and E-Commerce" sector. Now a day, both sectors are working the most with "Market and Customer Trends" along with "AML" and "Trading". Since these complex processes require more analysis and intelligence to find a definite output, Artificial Intelligence can be the mark in this sector. A Secondary study shows, that around 25% of the organization from these sectors such as AMAZON, eBay, CITI, etc already started to use Artificial Intelligence in business. Mostly, through these giants, the revolution in the field of data analysis and artificial intelligence will arrive.

## Compliance with Ethical Standards

**Conflicts of interest:** Authors declared that they have no conflict of interest.

**Human participants:** The conducted research follows the ethical standards and the authors ensured that they have not conducted any studies with human participants or animals.

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