LITERATURES REVIEW

The current research paper highlights the challenges, prerequisites and opportunities needed for AI and DL based business models. Review on BMI and digital transformation will be used to understand how the challenges and opportunities are mitigated and fulfilled. This section will give ideas about the following (i) understanding AI needs for digital transformation with its challenges (ii) understanding current business model, BMI potential and BM ecosystem role (iii) key aspects of digital transformation (iv) algorithmic models of BM and pricing.

AI and deep learning play integral roles in implementing personalized pricing strategies as part of business model innovation. Here's how they contribute to the process:

2.1 DATA ANALYSIS AND CUSTOMER INSIGHTS

The Role of Artificial Intelligence: Artificial intelligence, particularly machine learning algorithms, is used to evaluate large databases containing customer demographics, behavior, preferences, and purchase history.

Deep Learning's Function: Deep learning models, a subset of AI, excel in discovering detailed patterns and representations in data, allowing for a more nuanced knowledge of customer behavior.

As a result of combining AI with deep learning, firms may acquire detailed insights into individual client preferences and customize pricing tactics accordingly.

2.2 PREDICTIVE ANALYTICS

AI's Role: Using AI algorithms, predictive analytics estimates future customer behavior based on historical data.

Deep learning models improve predictive powers by capturing complex linkages and dependencies in data.

Outcome: Businesses can utilize AI and deep learning to forecast how customers would react to various price models, assisting in the development of individualized pricing strategies.

2.3   DYNAMIC PRICING

The Role of AI: AI-driven algorithms can examine real-time market conditions, rival pricing, and other external factors to dynamically modify pricing.

Deep Learning Models' Role: Deep learning models contribute to real-time analysis by dealing with complicated and nonlinear patterns in data.

Outcome: By combining AI and deep learning, firms may adopt dynamic pricing strategies that respond quickly to market changes, optimizing revenue and competitiveness.

2.4   CUSTOMER SEGMENTATION

The Role of Artificial Intelligence: AI algorithms categorize clients based on shared features, preferences, and behavior.

Deep Learning's Role: Deep learning models improve segmentation by revealing complex patterns that standard approaches may miss.

Outcome: Businesses can utilize AI and deep learning to identify client subgroups and then personalize pricing tactics for each segment, increasing the attractiveness of offers.

2.5   PREFERENCE LEARNING

The Role of AI: Artificial intelligence techniques such as reinforcement learning can be used to comprehend and learn from customer reactions to various pricing schemes.

Deep Learning's Function: Deep learning algorithms, particularly neural networks, are particularly adept at capturing and learning complex preferences.

As a result of merging AI and deep learning, firms can change pricing based on individual preferences, ensuring that the prices supplied fit with each customer's value perception.

2.6   CONTINUOUS IMPROVEMENT

The Role of AI: AI helps to create feedback loops in which customer comments are used to refine and improve pricing models.

Deep Learning's Function: Deep learning models are constantly learning from fresh data and adjusting to changing customer preferences.

The combination of AI and deep learning contributes to constant refining, ensuring that personalized pricing methods stay effective and in line with client expectations.

To summarize, incorporating AI and deep learning into personalized pricing for business model innovation enables companies to leverage data-driven insights, predict customer behavior, implement dynamic pricing, effectively segment customers, understand preferences, and continuously improve pricing strategies for a more personalized and responsive customer experience.

2.7 UNDERSTANDING AI NEEDS FOR DIGITAL TRANSFORMATION

The main aim of implementing AI for BM is to develop human like machine that can be able to mimic our cognitive study. This will solved with valuable tool that can be used to identify and solve the complex issues [38]. With this paper, the challenges of AI are listed as transparency, analog processes, lacking trust on AI and AI misunderstandings. Transparency is in the form of AI is not an independent technology rather it can be used as a function. The fields such as deep learning, neural networks and machine learning algorithms are used to process the data on different levels of abstraction and complexities [39].

Wortham et al. [40] obtained high transparency while building the intelligent system and to achieve interpretability is a challenge. If the built models are inadequate, the system harms the operations. This transparency will affects the trust of agency [41]. Trust is also related to technology and ability of the communication. Digital data acquisition constitute large amount data with AI algorithms [42]. Thus, the analog content are transformed into digital content. Insufficient dataset will impact the output and it is referred as garbage in garbage out. The black box issue of AI will affect the proper AI understands and its operations [43]. The mutual interpretation of these technologies are main challenge in implementation.

2.2 UNDERSTANDING CURRENT BUSINESS MODEL, BMI POTENTIAL AND BM ECOSYSTEM ROLE

This section will used to understand about business model design [44], opportunities of BMI and how it manages with external partners and stakeholders [45].

2.2.1 BMI

Business model can be defined as the mediator between economic value and technology [46] that will transform the digital application into

profitable outcomes. BM can be characterized as value creation, delivery and capture. DaSilva and Trkman [46], argues that BM can operationalizing the technique with dynamic skills. Hence, BM can be represented as long, medium and short term and interlinking processes. Chesbrough [47] described the BM understandings and its importance. Teece [48] enables the BM opportunities to take advantage to other competitors. BM imitation is the new strategy to achieve great outcome [49].

2.2.2 BM ecosystems role

Dedehayir et al. [50] declared four different roles of BM such as ecosystem orchestrator, value creation support roles, direct value creation roles and entrepreneurial roles. The leadership role consists of orchestration of the value chain and platform management. Eco system leaders can requires various roles based on the system operated. System governance can required the development and maintenance of the system, management of system resources and its developments. Open platforms entails the platform design that can enable the value creation which includes platform infrastructure and its innovations [51]. Direct value creation roles declared the customer specifications and its operations such as processing data from various contributors like hospitals, materials suppliers and first that contribute particular competencies called software developer [50]. Expert knowledge based companies defined the value support roles. Expert roles are the major one to the innovations of development. The entrepreneurial role is compared with ecosystem leader role and stats that less impact on ecosystem. This role can also includes sponsorships and link between researchers such as universities and firms.

2.2.3 Key aspects of digital transformation

Companies are transform its BM with digital techniques such as AI and DL with its benefits. The core operations of business, structure of organization and management are transformed [52]. Digital transformation not only includes IT initiatives but also includes structural re-design with IT strategies and functional strategies [53]. The dimensions such as use of technologies, value creation and structural changes and financial aspects are considered for better understanding about the digital transformation. Matt et al. [52] says that use of technologies can addresses the ability to solve the undeveloped concepts. This can embrace the first developer role, exploit and develops the immature technologies. The company can adopt with the technologies of

the surrounding firms. The digital transformation required to change the value creation that can impact the firms value chain. This can create new opportunities with the extension of current portfolios that will leads to new scope of business [54,55]. Matt et al was also argues that financial aspects also impacted by the digital transformation.

(iv) Algorithmic models of BM and pricing

The BM algorithmic conceptual model suggested by [56] drawn from the key theories such as economics, management, and political philosophy: organizational decision making theory, ethical pluralism, behavioral theory and social contract theory. The factors such as pressures and temptations of the firms influencing the decision making process. Kaptein [57] proposed a model with dimensions, consequences and conditions and proposed a gap created between forces require large struggle. Nissenbaum's [58] framework of contextual integrity can embrace the ethical norms that can bridge the gap between technology and organizational factors. Personalized price setting process depends on algorithm models and human judgement.Henschen [59] entails that loyalty programs are also the considered tool for personalized pricing with IT systems that can provide the point of sale promotions.

With the implementation of big data, AI and DL, companies are shifting their online environment sharing approach which leads mass customer offering with personalized pricing stated by Ghose and Huang [60]. McDonald [61] says that the current technologies are replaced with the in sotre video monitor with facial recognition. To maps the foot traffic using wife triangulation throughout the venue by Kopytof [62]. EzrachianStucke [63] discusses about the individual customer data tracking, mine and aggregated and also optimize the personalize pricing. Taylor et al. [64] and Zick et al. [65] reported that 80% of the customers are sharing their private data for research studies that demonstrate that how the individual learning through genetic markers indicate the risk of particular disease. This resulting can asymmetry between customers and insurance carriers impact on insurance pricing. Erlich and Narayanan [66] demonstrate the technique with quasi identifier to trace the identity of the individuals. Klitzman [67] exploits some solutions to acknowledge the uncertainty of the pricing level underlying results.

Boston Consulting Group (BCG) [68] researchers advertise the work progressive pricing (PP) which is the variant of dynamic pricing. PP builds optimization on price and yield management using algorithmic models to gather the consumer surplus of both raising and lowering prices. This optimizing a continuum of prices strategy expand the markets with increased

profits. This approach can be used by large retain bank to personalize the interest rate and monitors the cash transfer of customers to saving s banks as a predictive barometer. Ke [69] provides ridesharing services for pool discounts, surge pricing with algorithms that can offers the targeted customers with pricing incentives. Shakya et al. [70] discussed about the AI based model with optimization approaches are the evolution of revenue management where the cost effective price abundant of goods varieties are required. Lei et al. [71] gave ideas on personalized pricing in online marketplaces that require supply availability and customer doorstep fulfillment. Manyika et al. [72] discussed about the sensors embedding into IoT devices that can collect large volume of data of consumer behavior for data aggregation. Optimized decision making though adaptive to learning pricing are discussed by Ezrachi and Stucke [63]. Heath [73] stated that the transition of Ml required increase growth in training, validation and testing data.