A Birds Eye View into MCDM Applications within Digital Marketing

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Abstract

In the current digital era, digital technologies foster the development of digital marketing models to attract new customers and retain existing customers. However, with the availability of multiple technologies to facilitate the desired objectives. The decision makers face challenges towards selecting the right digital technology through consideration of several conflicting and asymmetric criteria related to the customers, organization, and the market environments. In this pursuit, firms can adapt Multi-Criteria Decision-Making Models to promote optimal decision making.

Keywords: MCDM**,** Digital Marketing, AI, Big Data, AR/VR, ML, IoT

Multi Criteria Decision Making (MCDM) or Multi Criteria Decision Analysis (MCDA) hails from the Operations Research Domain, and often comes in handy when one needs to evaluate multiple options against conflicting criteria. It is a multi-disciplinary concept with an application scope across multiple fields ranging from economics to product design. It encompasses a broad range of tools and methods that deploy both qualitative and quantitative data to convene the decision making. The tools enable efficient and effective decision making in complex situations at individual and organizational levels, as they are structured based on the domain knowledge of the experts. Further, they can be applied to solve a wide range of problems involving barrier analysis, factor ranking, performance evaluation, safety assessments, strategy/policy/portfolio/product/process/mix/channel/segments selection, and vendor/technology/location selection/ranking, etc.

Within the current competitive landscape, the decision-making process tends to get highly complicated with the availability of large datasets, decision options and perspectives posing challenges for the decision maker to evaluate all the decision scenarios critically and systematically prior to making the final decision. Additionally, the MCDM/MCDA techniques tend to systematize the complex evaluation process, perform holistic evaluation using both qualitative and quantitative criteria, provide valuation transparency towards validating the final decisions, and render the decision maker with an opportunity to embrace scientific methods within the decision-making process (Černevičienė and Kabašinskas, 2022). Furthermore, the MCDM methods can be classified into two categories based on the decision environments, i.e., into MADM (Multi-Attribute

Decision Making Methods) involving an implicit objective and a discrete decision space with finite number of alternatives/attributes and into MODM (Multi-Objective Decision Making Methods) involving explicit objectives and a continuous decision space with infinite number of alternatives/attributes (Eltarabishi *et al.*, 2020).

Consequently, the MCDM methods have been extensively applied within the Marketing Domain for ranking of marketing strategies, assessment of digital marketing technologies, reputation management, selection of apt media/marketing channels/market segments, brand performance evaluation, optimization of the marketing mix, target market identification, gauging customer loyalty levels, etc.

With the growth in the digital economy resulted in the growth of digital marketing landscape, as the technologies not only help the firms reduce the marketing costs but also foster accurate identification of target customer's and their needs towards improving the marketing conversion rates. Further, the technologies aid the firms with new market identifications and facilitate capturing of consumer need data at a deeper level. Additionally, with the availability of multiple intelligent technologies within the market, it stands crucial to select the optimal technology towards development of the firm's digital marketing model. Hence, decision makers need to account for several conflicting and asymmetric criteria related to the customers, organization, and the market environments towards effectively assessing the available digital marketing technologies towards achieving the desired objectives. Additionally, evaluation of several digital marketing technologies with inherent capabilities i.e. Artificial Intelligence (deployed within chatbots), Big data (embraced for customer behavior analysis), Augmented/Virtual Reality (employed to create breakthrough in customer experiences), Machine Learning (utilized extensively for logical categorization of customer data and information), and IoT (anchored towards accelerating the marketing processes based on real-time data), stands crucial towards fostering the firms core competitiveness. Consequently, making the decision problem, a multi-dimensional problem necessitating the application of MCDM methods for optimal decision making.

In this regard, a Hybrid MCDM method i.e., an integrated Analytical Hierarchical Processing (AHP) and COPRAS (Complex Proportional Assessment) aids with the selection of the optimal digital marketing technology through defining of the criteria weights using AHP and then ranking of the available digital marketing technologies based on the defined criteria weights using the COPRAS (Mukul *et al.*, 2019). Additionally, a fuzzy linguistic MCDM integrating a spherical Fuzzy Analytic Hierarchy Process (SF-AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), also aids with the selection of the optimal digital marketing technology through defining of the criteria weights using the SF-AHP and then ranking of the available digital marketing technologies based on the defined criteria weights using the TOPSIS (Trung and Thanh, 2022). Likewise, the optimal solution can also be reached through the application of an integrated AHP and TOPSIS MCDM Method (Sindhuja, 2022).

Finally, irrespective of the MCDM method embraced towards assessing the available digital marketing technologies, the Artificial Intelligence (AI) turns out to be the most optimal technology towards development of the firm's digital marketing model, as it facilitates rendering of services as per the customer preferences and needs.

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