Exploring the Use of AI to Manage Customer Relationship

Track: Artificial Intelligence in Marketing – The field, research directions, and methodological issues

Exploring the use of AI to manage customers' relationships

Paul Hopkinson[a], Rodrigo Perez-Vega[b], and Aishwarya Singhal[a]

[a]Heriot-Watt University, Dubai Campus, UAE
[b]Henley Business School, University of Reading, UK

Introduction

The field of customer relationship management (CRM) has seen significant developments in recent decades, including the increasing adoption of automated forms of interactivity between the brand and its customers (e.g. Ostrom et al. 2015; Bitner et al. 2000). An example of early types of automated customer relationship management were autoresponders and automatically generated notifications (Dysart, 1999). However, with the advancement in Artificial Intelligence (AI) technologies these interactions are becoming more sophisticated (Van Doorn et al. 2017). Kumar et al. (2016) argue that customer interactions and relationships with firms via automated means can be expected to increase in the future, especially since the ultimate goal of artificial intelligence as a science is to enable machines to do things that would require intelligence if done by humans (Boden, 1977). It is in this context that we identify that CRM can be expected to experience rapid changes as new advancements in AI are implemented in this field. The following sections examine the relationship of customer relationship management and artificial intelligence as well as the different applications currently found in the literature. We also discuss some of the future research avenues in this field and propose a conceptual model

Customer Relationship Management and Artificial Intelligence

Early definitions of relationship marketing (e.g. Berry, 1983; Gronroos, 1990) and subsequent Customer Relationship Marketing (CRM) frameworks propose that the management of customer relationships can be divided into a series of stages corresponding to the relationship life-cycle (Dwyer et al, 1987): e.g. attract, retain, enhance. Gronroos (1994), was amongst the first, however, to draw explicit attention to the importance of the "termination" phase, recognising that relationship do come to an end and that regardless of how the termination is initiated (whether at the behest of either party or by mutual consent the process needs to be managed (Tahtinen & Halinen, 2002).
We have used this 'stages based' approach to relationship management to explore the potential applications for AI (See Table 1 and Figure 1). Although some of these of these applications are already well established (e.g. programmatic advertising and chat-bots) some of the others are more speculative (intelligent content management) and represent possible trajectories based on the convergence of predictive analytics and current marketing technologies.

Table 1: Exploring the Potential for using AI in the Management of Customer Relationships

CRM House Elements	Applications of Artificial Intelligence (AI)
Attract/ Acquire	• Programmatic advertising to serve customised advertisements tailored to customer behaviour patterns • Automated servicing (Chat-bots) to provide deal with pre-sales and POS queries in real-time • Use of AI to provide relevant/ customised POS recommendations based on purchase patterns of similar customers as well as purchase history • Intelligent content marketing – e.g. serving relevant content and recommendations from customers own network and/or vlogger/bloggers they follow and tailoring content to the stage the customer has reached in along the path to purchase • Automated email – again to deliver relevant messages and content to selected customers (following cart-abandonment). AI could be used to re-target those customers that are most likely convert. • Use predictive analytics likely response to determine the most appropriate targets (candidates for relationship building), purchase behaviour patterns, servicing needs and relationship duration and to tailor interactions to maximise engagement and optimise channel strategies
Retain/Maintain	• Automated servicing to deal with post-sale enquiries/needs in real time that is tailored to customers' needs, previous interaction patterns and likely 'pain points'. • Intelligent, tailored content marketing– serving customised 'how to'/application videos that are designed to help the customers to get the best out of the product/service and are tailored to the customer's characteristics/circumstances/queries/predicted journey path/network of connections and patterns of influence • Programmatic advertising to deliver ads tailored to the customers' actual/predicted anxieties to reduce post-purchase dissonance and remind the customer of the benefits inherent in the brand/product/service. • Automated email –deliver relevant, personalized messages and content directly to selected customers to deal with predicted pain points – e.g. first six months of product usage may be when the majority of problems or issues arise, and less experienced customers may be more susceptible to switching or exiting the relationship (e.g. FT undergraduate students during the first 6 months of their studies). • Use of predicted analytics to determine which customers are most likely to stay or defect and optimal channel strategy to reach them or to maximise CLV
Enhance/Develop	• Intelligent, tailored content marketing– serving customised content to promote complementary or supplementary products or upgrades (to cross-sell, up-sell) and thus deepen or extend the relationship.

	Content could be customised based on customer's predicted journey path and circumstances/past queries.AI would provide insight into the most receptive candidates based on patterns of usage and predicted responses to intended strategies • Programmatic advertising to deliver ads tailored to the customers actual/predicted take up of new/additional products and services • Automated email –deliver relevant, personalised messages and content directly to selected customers to promote new services and to respond to FAQs. • Automated/intelligent servicing of client's routine needs: e.g. car service appointments automatically booked when service intervals or mileage thresholds are reached or appointments with financial advisers are flagged when investment/financial portfolio performance falls below a predetermined threshold etc.
Terminate	• Intelligent, tailored content marketing–serving content to help the customer on to the next stage in their journey – e.g. maturing of a pensions policy – how to enjoy your retirement • Automated/intelligent servicing – helping clients deal with the formalities of ending a relationship: closing accounts, etc. • Automated email and programmatic advertising to clients to remind re-engage with clients that have defected or left or reminds those in danger of defecting of the product/service benefits.

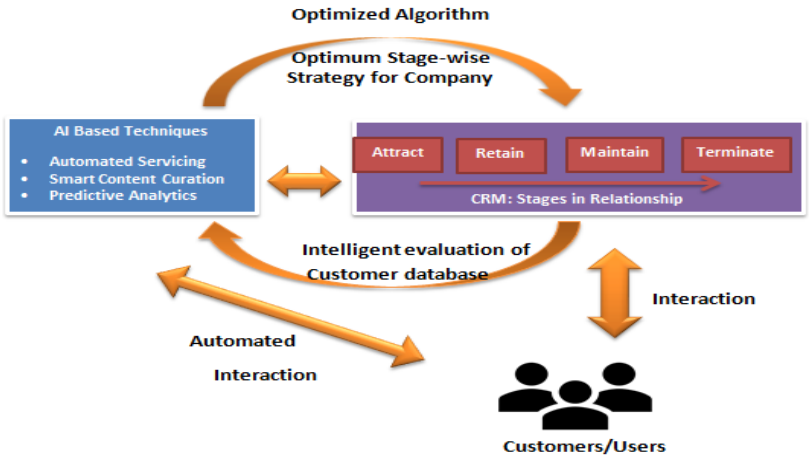

Fig.1 Optimised AI-CRM scenario

Early 2000's saw the emergence of customer relationship management (CRM). Database of customers containing information about each customer is a crucial element of CRM. All this information may refer to socio-economic characteristics (gender, age, education and income level), previous customer interactions (like offers made and offer responses, services and complaints), and customer purchase history (details of purchase, e.g. how much and when) (Wiernega, 2009). Use of this data enabled prediction of customer response to new offers or prediction of retention of the customer, all of which proved very useful for marketing purposes. Examples like identification and selection of customers in need for extra attention as they display high likelihood of switching brand/company, promising prospects for product promotion, etc. were made possible with the availability of a large set of *predictive modelling techniques* (Weirenga, 2010). Interestingly, the most prominent predictive techniques -Classification and regression trees (CART) and Neural networks (NN) have their roots in AI. CRM is regarded amongst the most rapidly growing areas of marketing. Moreover, investments in customer databases are significantly vast, and companies wish to realise a maximum return on these. Therefore, predictive modelling techniques require advanced sophistication for future customer behaviour and AI can help to deal with more judgmental problems in marketing. Innovation and creativity play an important role in CRM; this should appeal to the imaginative attributes of AI.

The numbers of academic works examining the impact of AI on marketing remains limited reflecting the nascency of the topic. Nevertheless, there have been a few notable articles that pointed to the value of AI in improving customer experiences, e.g. Parise, et al., 2016 discuss the opportunities for real-time servicing and the use of virtual assistants to solving what they term the 'crisis of immediacy' (Parise, et al., 2016.p.411). Bradlow et al. (2017) discuss the use of big data to improve targeting and measure outcomes as well as the use of predictive analytics to optimise pricing. Others, such as, have focused on the impact of AI on sales and the selling process (Syam & Sharma 2018) and the use of AI in segmentation (e.g. Culotta, et al. 2015) focus on the use of to predict customer characteristics from social media behaviour – whom they follow).

Consistent with contemporary views on this topic (e.g. Gaskell 2016), it is our contention that AI would serve as a means of augmenting existing relationship management technologies and approaches rather than a complete replacement for human interaction. Relationships are fundamentally a social phenomenon, and in some categories of offering social interaction serves an important mechanism to evaluate the quality of service, especially those that are said to be high in so-called 'credence' or 'experience' qualities such as professional services (Hogg 1998). Nevertheless, as Brynjolfsson & Mcafee (2017) suggest, it would be wrong to assume that AI is only suited to handling impersonal interactions, noting that some machine learning technologies are already able to discern human emotions. To quote these authors:

> *"Although AI is already in use in thousands of companies around the world, most big opportunities have not yet been tapped."* Brynjolfsson & Mcafee (2017)

In closing, therefore, we contend that significant scope exists for further exploration of the role of AI in managing relationships and as new technologies unfold the potential academics to contribute to knowledge in this field can only continue to expand.

References

Althuizen, N.A.P., Wierenga, B.: Deploying Analogical Reasoning as a Decision Support and Understanding the Predictive Accuracy of Customer Churn Models. *Journal of Marketing Research* 43, 204–211 (2006)

Bitner, M. J., Brown, S. W., & Meuter, M. L. (2000). Technology infusion in service encounters. *Journal of the Academy of marketing Science*, *28*(1), 138-149.

Berry, L.L. (1983), "Relationship marketing", in Berry, L.L., Shostack, G.L. and Upah, G.D. (Eds), *Emerging Perspectives on Services Marketing*, American Marketing Association, Chicago, IL, pp. 25-8.

Bradlow, E. T., Gangwar, M., Kopalle, P., & Voleti, S. (2017). The role of big data and predictive analytics in retailing. *Journal of Retailing*, 93(1), 79-95.

Brynjolfsson, E., & Mcafee, A. (2017). The business of artificial intelligence. *Harvard Business Review*.

Boden, M.A. (1977). *Artificial Intelligence and Natural Man*. Basic Books, New York.

Culotta, A., Ravi, N. K., & Cutler, J. (2015, June). Predicting the demographics of twitter users from website traffic data. In *29th AAAI Conference on Artificial Intelligence, AAAI 2015 and the 27th Innovative Applications of Artificial Intelligence Conference*.

Dwyer, Robert F., Paul H. Schurr, and Sejo Oh (1987), Developing Buyer-Seller Relationships, *Journal of Marketing*, 51 (April), 11-27.

Dysart, J. (1999). Email marketing grows up: a primer for the new millennium. *NetWorker*, 3(4), 40-41.

Gaskell, A. (2016). Why AI Should Augment, And Not Replace, Staff. Forbes, April 14, Accessed 23 February 2018 at: https://www.forbes.com/sites/adigaskell/2016/04/14/why-ai-should-augment-and-not-replace-staff/#1db300f12398

Goldstein, D.K.: Product Manager's Use of Scanner Data: a Story of Organizational Learning. In: Desphandé, R. (ed.) *Using Market Knowledge*, pp. 191–216. Sage, Thousand

Grönroos, C. (1990). Service management and marketing: Managing the moments of truth in service competition. Jossey-Bass.

Gronroos, C. (1994). From marketing mix to relationship marketing: Towards a paradigm shift in marketing. *Asia-Australia Marketing Journal*, 2(1), 9-29.

Hogg, G. (1998). Consumers and services. Wiley.

Kumar, V., Ashutosh Dixit, Rajshekar Javalgi, and Mayukh Dass (2016), Research Framework, Strategies, and Applications of Intelligent Agent Technologies (IATs) in Marketing, *Journal of the Academy of Marketing Science*, 44(1), 24-45.

Leake, D.B.: AI Magazine Poster: The AI Landscape. *AI Magazine* 29(2), 3

Mc Cann, J.M., Gallagher, J.P.*: Expert Systems for Scanner Data Environments*. Kluwer

Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patricio, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, *18*(2), 127-159.

Parise, S., Guinan, P. J., & Kafka, R. (2016). Solving the crisis of immediacy: How digital technology can transform the customer experience. *Business Horizons*, 59(4), 411-420.

Syam, N., & Sharma, A. (2018). Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice. *Industrial Marketing Management*.

Tahtinen, J., & Halinen, A. (2002). Research on ending exchange relationships: a categorization, assessment and outlook. *Marketing Theory*, 2(2), 165-188.

Van Bruggen, G., & Wierenga, B. (2001). Matching management support systems and managerial problem-solving modes: The key to effective decision support. *European Management Journal*, 19(3), 228-238.

Van Doorn, Jenny, Martin Mende, S. Noble, John Hulland, Amy Ostrom, Dhruv Grewal and A. Petersen, (2017), Domo Arigato Mr. Roboto: Emergence of Automated Social Presence in Organizational Frontlines and Customers' Service Experiences, *Journal of Service Research*, 20(1) 43-58

Wierenga, B., & Van Bruggen, G. H. (2000). *Marketing management support systems: Principles, tools, and implementation* (Vol. 10). Springer Science & Business Media.