Potential of Facebook's artificial intelligence for marketing

Based on a quantitative survey of consumer attitude towards buying food online before COVID19

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Abstract: Due to the Corona pandemic and the age of digitization, online food platforms have become more and more important. Therefore, the trend to buy food online is increasing. Nevertheless, many direct sellers and especially conventional farmers are not familiar with selling their products online. Different barriers can affect the acceptance of selling food online. Artificial Intelligence (AI) can help to reduce barriers and fill the gap of missing know-how. This study uses Facebook's AI for targeted marketing campaigns to find the potential audiences that consist of online food buyers based on significant results of a quantitative online survey (n=172). As a result, people with properties such as animal welfare proponents had a positive mood towards buying local food online.

Keywords: Artificial Intelligence (AI), marketing, direct marketer, Facebook Targeting, quantitative survey

1 Introduction

Due to the Corona pandemic and the age of digitization, online food platforms have become more and more important for direct sellers. [Ne16] shows that nowadays, one in three persons buys food or pet food online. There is a high probability that the Corona pandemic increases the demand for online food as well. Additionally, it is easy for consumers to receive recommendations or to get information about products [Ne16]. Therefore, the trend to buy food online is increasing. Buying food online has doubled in revenue over the last two years up to 2.6 bn euros in 2020 [St20]. [If20] shows that it now makes up 1.4 % of the retail sector. Thus, it is comprehensible that 70 % of organic farmers are planning to expand their direct marketing efforts [BK20]. Especially for smaller direct sellers, online food delivery can be a way to increase their revenues [Ro14]. Smaller farms are normally disadvantaged in the supply chain of the food sector due to lower quantities they typically provide and the higher transaction costs [WKL10].

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Nevertheless, many direct sellers and especially conventional farmers are not familiar with selling their products online. Missing know-how and infrastructure can be a barrier for farmers [BM10]. Since the Corona pandemic, farmers and direct sellers have realized that digitization can be relevant for success. However, AI can help farmers break through existing barriers. Facebook's AI can be easily used for targeted marketing campaigns and to find the correct audience. [Fa2021]

Targeting within online marketing describes targeted advertising to a group with defined properties [Wa18]. As a result, properties such as location, demographics, behavior, social media connections or interests can be used to form a group for targeted advertising [Fa2021b]. Facebook can measure the reach and the impressions of an advertising post, for example. The latter includes how often the advertising was shown on a person's browser page while the reach is estimating the reached persons. [Fa2021c]

In this study, the AI of Facebooks targeting campaigns is used to find the correct audiences based on results of a quantitative survey, which analyzes consumer behavior of buying food online before the Corona pandemic started in Germany.

2 Material and Methods

To gather insights about the properties of the relevant audiences, a quantitative online survey was carried out. In the second step, the results of the survey were used for a targeted advertising campaign on Facebook. This campaign was based on defined properties, which are shown in Table 1 and can be used on the trial-and-error principle.

2.1 Quantitative online survey

The survey was conducted in German language in January 2019 to analyze consumers' behavior towards buying food online. It contains 23 questions about socio-demographic attributes, attitudes towards regionality, supermarkets, weekly food markets, animal welfare and fresh cooked or fast-food meals. The survey contained a mixture of five-point Likert-scaled and multiple-choice answers. Likert-scaled questions such as "Are you buying food on a weekly market?" could answered with "1" (never) up to "5" (always). Multiple choice questions such as "What fits you best?" were set with relevant answers like "vegan", "vegetarian", "flexitarian" and "meat-eater".

Google forms was used for preparing the survey. For this reason, sharing via social media platforms such as Facebook and Whatsapp was easily possible.

To find correlations between the answers, a multiple regression was conducted with SPSS. Regionality was used as the dependent variable. The multiple regressions confidence interval was set to 95 %.

2.2 Facebook's targeted advertising

The Facebook targeting was conducted for 24 hours in October 2021, based on a total budget of 30 euros. The results of the online survey described above were used as input for trial-and-error targeting. A Facebook advertisement campaign with a small budget was created, split into different targeted audiences. Table 1 shows the target interests of each audience, which had a high correlation with buying local food online. From the list of possible interest categories within Facebook, the most relevant ones were chosen that came closes to the survey's results. Male and female subjects between the ages of 18-65+ were included in a perimeter of 20 km around Gießen, Osnabrück and Stadthagen (Lower Saxony) in Germany. Consequently, a potential audience of 442,000 to 484,800 persons was estimated by Facebook given attributes. The impressions and the reach were measured with the Facebook Ad Manager. To avoid unfair conditions, all audiences (A1-A3) were shown the same Facebook posts, which intended an emotional marketing.

	Audience (A1)	**Audience (A2)**	**Audience (A3)**
Targeted interests	organic food, sustainability, regional foods, organic farming, natural environment, weekly market	animal welfare, Demeter, vegetarianism, livestock husbandry, free-range husbandry, veganism, Bioland	Chefkoch.de, cookbook, healthy diet, recipes, cooking, Thermomix
Targeted disinterests	Rewe, Edeka, Lidl, discount store, Aldi, Einkaufszentren		McDonald's, Burger King, Kentucky Fried Chicken, Fast Food
Estimated audience size	74,400-88,600	247,300-266,000	120,300-130,200

Tab. 1: Target interests of audiences A1-A3

3 Results

3.1 Quantitative online survey

172 participants were part of the survey. The adjusted R-Square is 0.383, which means that 38.3 % of the variance can be explained with the multiple regression model. The Anova shows a significance (<.001) correlation between the dependent variable and the predictors in the multiple regression model. Table 2 below shows the significance between the independent variables "happiness with supermarkets (7)", "weekly market buyers (9)", "informed in animal welfare (11)", "awareness of animal welfare (10)", "quality of meal (15)" and the dependent variable "regionality (16)"

	Unstandardized Coefficients		**Standardized Coefficients**	**T**	**Sig.**	**95% Confidence Interval (B)**	
Model	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.132	.576		1.964	.051	-.006	2.270
happiness with supermarkets (7)	-.216	.091	-.153	-2.359	.019	-.396	-.035
weekly market buyers (9)	.303	.087	232	3.483	.001	.131	.475
informed in animal welfare (11)	.176	.061	.179	2.882	.004	.056	.297
awareness of animal welfare (10)	.266	.059	.295	4.486	.000	.149	.383
quality of meal (15)	.174	.078	.145	2.222	.028	.019	.329

Tab. 2: Coefficients table of dependent variable a "regionality (16)"

3.2 Facebook's targeted advertising

The majority of the campaign budget (20.09 euros of 30 euros) was used for Audience A2. Facebook knows the participant's attitudes and measures the interaction between them and the advertising post to get the best performance. For this reason, Facebook uses this data to actively direct more budget to the audience with a higher performance indicator such as reach and impressions. Therefore, persons with properties concerning to animal welfare (Audience A2) received the largest amount of the budget. Persons with properties towards sustainability (Audience A1) received the least amount of budget, while persons with a focus on high quality food (Audience A3) were in the mid-reach, as shown in Figure 2 below.

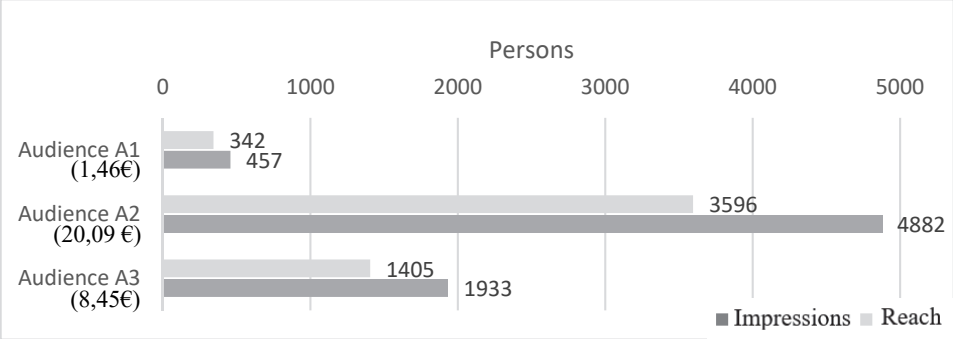

Fig. 1: Impressions, reach and budget of audience A1-A3

4 Discussion and conclusion

The results of the quantitative online survey can be used as an indicator and a basis for creating a targeted Facebook campaign to specify the audiences. Due to the multiple regression model, significant correlations between regionality and variables such as animal welfare, quality of meals and weekly market buyers could be found. The audience A1 performed the worst in the targeting campaign although it has the highest similarity with regionality. Missing interests in using social media and hence not being reached by Facebook's ads could be reasons for this. The fact that the survey was conducted in early 2019 at a time when local online food stores were not popular yet could further influence the results. Additionally, further variables such as income or education levels were not part of the insights due to missing Likert-scales in some of the survey's questions. Hence, such data could not be part of setting up the Facebook targeting more precisely.

Facebook's advertising campaigns can be a good solution for direct sellers to find and to promote the correct audiences. For an effective targeting it is necessary to know the properties of the company's audiences well. A broad targeting needs a higher campaign budget to find the correct audiences [Fa2021]. Nevertheless, it is a compromise to decide

between a specified or a broad targeting. Last but not least, the success of a Facebook campaign depends on several parameters such as campaign duration, budget, selection of interests, attractiveness of the post or existing followers.

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