Using big data to understand consumer behaviour on ethical issues

Phani Kumar Chintakayala[1,2] *and C. William Young*[2,3]

[1] Leeds University Business School, University of Leeds, Leeds, England; [2] ESRC Consumer Data Research Centre, University of Leeds, Leeds, England; [3] Sustainability Research Institute, School of Earth and Environment, University of Leeds, Leeds, England.

The Consumer Data Research Centre (CDRC) was established by the UK Economic and Social Research Council and launched its data services in 2015. The project is led by the University of Leeds and UCL, with partners at the Universities of Liverpool and Oxford. It is working with consumer-related organisations and businesses to open up their data resources to trusted researchers, enabling them to carry out important social and economic research.

Introduction

Over the last few years there has been much talk about how so-called "big data" is the future and if you are not exploiting it, you are losing your competitive advantage. So what is there in the latest wave of enthusiasm on big data to help organisations, researchers and ethical consumers?

Data growth

There is better and more detailed data breakdown and more new forms of data than ever before. This includes sales data, loyalty card data, social media, product sensors, new monitors and mobile phone data. There is lots of this data, often in real time and there are many ways to analyse and model it. This is nicely summarised in the famous "four Vs" of big data from IBM (volume, velocity, variety and veracity) (IBM 2017).

We think there are ten opportunities to use big data for companies, organisations, researchers and ethical consumers interested in the ethics of behaviour and products.

(1) Gaining greater detail behind global sustainability performance indicators. For example energy use by using smart meters on production lines, in retailers, on products or in people's homes can produce a better understanding of energy use in the system.

(2) Accessing supply chain data more readily. There is an opportunity from being able to access data from global suppliers up and down the supply chain more readily, in a timelier fashion and with better accuracy. This will help to make better decisions over product/service changes

knowing the associated sustainability implications. As climate change impacts global supply chains, this data may help adaptation and resilience of supply.

(3) Gaining an insight in supply chain logistics and customer transport habits. There is now the ability to use mobile phone data to identify patterns in transport networks, giving the opportunity for better planning for more efficient use of fuel and reduced congestion. This may also provide consumers better opportunities to change to cleaner forms of transportation.

(4) Predicting changes in behaviour from social media. This is one of the most talked about aspects of big data and yet the most technically difficult. Much social media data is unstructured and in picture, pixels or abbreviated language. But there are opportunities to see how individuals react to an emerging sustainability issue or a new technology.

(5) Social media is a good way for people to identify up and coming sustainability issues from their own stakeholders. These may be key local NGOs, community leaders, political leaders, suppliers, competitors, employees as well as customers. Identifying opinion formers is vital for filtering the volume of social media.

(6) Consumer behaviour with products and services. As companies try to influence consumers to reduce the environmental impacts on the use phase of products and services, getting feedback on the effectiveness of these interventions is important for future strategy.

(7) Transparency to customers and NGOs by companies. Access by consumers to the data behind product eco-labels, or working condition audit results from the factories producing their products, is important for confidence. Better presentation, accuracy and timeliness of this is an advantage.

(8) Better marketing or targeting of greener products, services and corporate sustainability programmes. Being able to better segment and directly contact potential customers with personalised promotions is already being developed. This can help in the sustainability arena as well.

(9) Interaction with consumers and stakeholders in the shared or collaborative economy. The growing ability to share resources, between companies and consumers has been facilitated by social media. Entrepreneurs are already in this space with apps allowing sharing of food leftovers or power tools. There are great opportunities for this to be further developed reducing the material flow though society using different business models.

(10) Growing emphasis on smart cities, combined with the development of “mega cities” where the majority of the world population may live. Smart energy, water, waste and transport grids are just one area, but the buildings being able to heat and cool more smartly is another opportunity.

Don't get lost!

There are some difficulties with big data that users of big data need to be aware.

Firstly, getting lost in the enormous amount of data is easy, so having objectives or research questions is essential. Secondly, a few big corporations have been quick to jump on correlations between different data sets without common sense kicking in quick enough to identify that there cannot be a causation. Finally, there are the ethics of the privacy of individuals and communities, which need to be protected even if the data is publicly available.

Overall there is much here for people to work on and to improve the sustainability performance of company operations, products, services, supply chains and even customers. However, as much data as possible needs to be open access for consumers, researchers, local communities and innovators for big data to have the biggest benefit for people and planet.

Ethical consumer markets data

Consumer Data Research Centre (CDRC[7]) and Ethical Consumer have teamed up in 2014 to produce the annual 'Ethical Consumer market report 2014' and to share data and information resources. The time series data on UK consumers' spending on ethical products across sectors such as food, fashion, finance etc. for more than a decade is a valuable input for researchers working on ethical consumerism. CDRC has made the data open access[8] and is using the same information directly or indirectly in research and dissertations.

At CDRC, a team of researchers from Leeds University Business School (LUBS) and the School of Earth and Environment (SEE), University of Leeds is working on identifying the drivers and barriers for the consumption of ethical/sustainable products. The team is also investigating the influence of socio-demographic characteristics and ethical attitudes on the consumption of sustainable products, the implicit values of ethical/sustainable characteristics of products. A glimpse of some of the research and findings from CDRC team can be seen below.

Examples from the food sector

Examples of the types of research being piloted using data from the food sector by CDRC include the consumption of milk and egg products. The results clearly indicate that not all the sustainable

7 CDRC is an ESRC-funded centre run by the University of Leeds, University College London, University of Liverpool and University of Oxford, see www.cdrc.ac.uk.

8 https://data.cdrc.ac.uk/dataset/ethical-consumer-markets-report-2001-uk

products are considered the same by consumers, and consumption behaviour varies across sustainable product categories.

i) A linked data analysis was carried out by combining sales data of organic milk and free range eggs from a retailer with over 300 stores across the UK, green and ethical attitude data from CDRC's data partner, and socio-demographic and deprivation data from open sources. The analysis revealed that, in general, the consumers with deeper green and ethical attitudes are the most likely consumers of sustainable products. Deprivation has a negative effect on the consumption of sustainable products. Price, as expected, has a negative effect but the impact varies across products. Convenience stores have significant negative effect on the consumption of sustainable products. The influences of socio-demographic characteristics such as gender, age, ethnicity etc. seem to vary by product categories.

Deeper green and ethical attitudes have a significant positive influence on the consumption of organic milk. Deprivation and Convenience stores have significant negative effect on the consumption of organic milk. Our analysis suggests that female consumers, consumers aged between 25 and 44 years, families with children between 11 and 17 are more likely to purchase organic milk. Families with children under 11 are less likely be organic milk consumers. With regard to free range eggs, eco-friendly green and ethical attitudes, deprivation and convenience store are the only parameters that have an influence on the purchase of free range eggs. While eco-friendly green and ethical attitudes have a positive influence the rest have a negative influence. Surprisingly or not, none of the socio-demographic characteristics has shown a significant effect.

ii) A further analysis of consumers' willingness to pay more for ethical/sustainable products indicate that the implicit value of free range eggs is 50% more, and the implicit value of organic eggs is 141% more compared to the enriched caged eggs. With regards to organic milk, the average implicit value of organic milk across all the available sizes is 33% more than conventional milk.

iii) In a separate analysis, we have also figured it out that with in the UK, there are regional differences in the preferences of consumers towards ethical/sustainable products. We found out that consumers in Wales prefer 'local' free range eggs compared to private (retailer) brands. On the other hand, consumers in England prefer private (retailer) brand free range eggs over 'local'.

Example from the energy sector

We have interviewed about 1000 energy consumers and asked whether they would take measures to reduce the consumption of energy in order to reduce their carbon footprint towards reducing global warming. Consumers were offered a carbon permit scheme to help them achieve their targets. The research revealed that about 70% of the consumers were willing to reduce their carbon emissions/energy usage when there is a scheme. Analysis suggests that the demographic factors affecting a consumer's probability of reducing emissions were: if there are children in the household; if the consumer is single, or male or highly educated. The attitudinal factor that affects the consumer behaviours the most is, unsurprisingly, whether the consumer believes there is an urgent need to tackle climate change.

Conclusions

Big data can help organisations, researchers and ethical consumers understand the ethics around consumer behaviour and products. The opportunities to link different types of data is exciting but must be research-question-led to avoid digging for non-existent causal links. The methods and access to data is still a barrier but open access is key to solving this. Big data will probably only help in filling in the details of our knowledge on ethical consumption and on products, but this can only help our decision making.

References

IBM. (2017). The Four V's of Big Data. *IBM.* [Online]. Available at: http://www.ibmbigdatahub.com/infographic/four-vs-big-data (Accessed on 15 February 2017).

For Citation

Chintakayala, P. K. & Young, W. C. (2017). Using big data to understand consumer behaviour on ethical issues. *Journal of Consumer Ethics.* 1(1), pp. 43-47.