Beyond Open Government: Ontologies and Data Architectures to Support Ethical Consumption

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ABSTRACT
Two important trends on openness are promoting improved accountability from government and private organizations. The case of private transparency finds its roots in consumer and other stakeholder movements. The open government movement in the US is looking for alternatives to "smart disclosure," which implies providing consumers with better information to make better buying choices. We explore current knowledge on ethical consumption, as well as two influential technological tools to support consumer decisions. Our initial discussion suggests that the use of ontologies and data architectures, together with the appropriate policy environment and governance system, may solve some of the current problems identified.

Categories and Subject Descriptors
K.4.1 [**Public Policy Issues**]: Private Sector Transparency and Ethical Consumption

General Terms
Management, Design, Human Factors, Standardization, Languages, Theory, Legal Aspects.

Keywords
Sustainability, supply-chain, ethical consumption, private sector transparency.

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1. INTRODUCTION
In the last years we have witnessed two parallel but closely related trends. First, governments around the world have increasingly worked to make their operations and decisions more open [17]. On the other hand, a there is a trend pushing corporate organizations to be more accountable, transparent, and ethical [2,6]. Although the first documented stakeholder actions to hold corporations accountable and transparent took place in the early 1600's [2], the movement has intensified in the last decades through grassroots movements lead by NGOs to address perceived failures by States to protect workers [6], and more recently, because of an increased consumer interest in the environment and sustainability [14]. In the US, government has also included as part of its open government initiative, the need to take regulatory approaches to "smart disclosure" of information needed to help consumers to make better choices[1] [19].

Although there are many formal attempts to measure and communicate corporate practices to consumers (surveys, indexes, or technology applications), there is no agreement on what information should be disclosed to consumers to better help their decision making. Moreover, there is even less agreement in terms of how to ensure data availability, reliability, and validity, as well as transparency of the processes to disclose such information [14].

Thus, the purpose of this paper is to explore what is the relevant information for consumers, as well as feasible ways of pulling the information together to fulfill consumers' needs. To accomplish this objective, we explore the literature on ethical consumption and two prominent tools for ethical consumption in the US and the European Union. The paper ends by proposing the use of open architecture and innovative governance systems not only to enable interoperability along the supply chain, but also to improve consumer access to information to make better buying decisions.

[1] http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/informing-consumers-through-smart-disclosure.pdf

2. LITERATURE REVIEW

2.1 Understanding Ethical Consumer Values and Preferences

A large body of literature focusing on ethical consumption is based on the premise that consumer behavior is "rational". As a rational actor, a consumer will seek a product that satisfies his/her needs by optimally considering all available alternatives and information [7]. The consumer consumption behavior is guided by the combination of their moral sentiments and economic motives, especially for the sustainable products [1].

Based on their information seeking behavior, consumers can be categorized into: the "super-informed" and the "ignorant" [12]. The "super-informed" consumers actively search for product information related to social and environmental values. These types of consumers consider social attributes such as fair labor practices [13], environmental attributes such as climate change, carbon footprint, recycling, energy conservation and other. The "ignorant" consumers have to rely on the information provided by supply-chain actors and government. Disclosure of organizational and industry information becomes a valuable tool to guide ethical consumption decisions [5].

Other streams of literature depict some ethical consumers as altruistic actors. These consumers adopt their ethical values into their life styles [13], and adjust their behavior to consume environmental friendly, ethical or fairly traded products and show pro-environment behaviors [3,13,16]. Consumers who are more involved in ethical lifestyles perceived higher benefits from additional information [18].

Other research shows that the degree of commitment to the ethical values also depends on economic factors. Ethical consumers have to make a compromise due to conflicting and competing priorities [16]. The social and environmental attributes and consumer lifestyles serve as interacting and/or moderating variables in the determinants of ethical consumption behavior. Research show that consumers deal with three interacting factors in ethical consumption behavior, price, quality and convenience [3].

2.2 Sustainability Liability

Following ethical consumption could become a liability for the consumers. In general, although consumers might shift their purchasing preference from cheaper non-labeled products, they may not venture to choose more expensive alternatives [16]. Buying unethical products is usually cheaper than buying better equivalent products thus hindering the proliferation of ethical consumption [5]. Researchers argue that this is due to the fact that higher costs to the environment does not translate into higher price to consumers, and capturing all social and environmental costs associated with a product is hard to accomplish [5].

2.3 The Role of Trust for Ethical Consumer

Trust in information plays also a key role in consumption decisions. Trust formation is affected by shared values and joint beliefs held by consumers and companies about certain social or ethical behavior [15]. Consumers rely on existing information to assess the conformance of ethical values practiced by particular companies [15]. Findings from these streams of research suggest that consumer's trust in the product depends partly on consumer's trust in the company's ethical conduct and partly on product labeling. Thus, some research explores the role of trust in the context of corporate social responsibility (CSR). This research found that ethical conduct reflected in the CRS report influences consumers' perception of trust toward the company [4,15]. However, trust based on the CSR practices does not always account for corporate success in the market [4]. The positive impact of trust depends on factors such as consumers' perceptions of the social reputation of a company [4], product quality and consumer satisfaction [15].

Other stream of research assesses consumers' trust based product labeling or certification. This research explores the values that consumers attach to certification and labels. For instance, consumers positively correlate organic certification with values such as stricter production standards and control system, domestic origination of product, and familiarity with the logo as source of trust [8]. Customers rely on the label regardless of their understanding of the meaning behind label [3].

3. METHOD

We used a convenience sampling approach to identify the current tools providing consumers with information for value-based purchasing. We chose to evaluate Barcoo and GoodGuide based on the following considerations: 1) each tool was developed and is primarily used on a different continent, thus enabling us to make a comparison. Barcoo was established and widely used in Europe while GoodGuide was established and extensively used in North America. 2) Both tools are currently popular tools used for value-based purchasing considerations.

4. RESULTS

4.1 Ethical Consumption – Online Information Strategy

This section evaluates the above mentioned tools that are designed to help consumers make ethical purchasing decisions. The evaluation focuses on examining the data problems related to building the tool, identifying the source of trust on the measurements used in each tool and delineating the possible limitations of each tool.

4.1.1 GoodGuide (www.goodguide.com)

GoodGuide was founded in 2007 by Dara O'Rourke, a professor specializing in global supply chain at the University of California at Berkeley. The mission of GoodGuide is to transform the marketplace by helping consumers make value-based purchasing decisions. It provides expert judgment about the health, environment, and social performance of products and companies with a team of scientific and technology experts. GoodGuide gives four 1-10 numeric ratings, with one general score and three sub-scores for health, environmental and social performance of the product or the company respectively.

4.1.2 Barcoo (www.barcoo.com)

Barcoo is an independent service that offers consumers product information on their mobile phone. Consumer can use their mobile phone to scan the barcode of products and obtain background information about the product. Barcoo has a customer base of more than two million in Germany. It is used mostly in Europe. The information provided by Barcoo includes ingredients, nutrition value, certification, and other environmental information, as well as price comparison and users reviews.

A summary of the evaluation on GoodGuide and Barcoo is presented in Table 1. The assessment on both tools indicates several limitations that exist in both tools: 1) lack of clarity in the mechanism to generate the score, 2) data collection, matching, and processing is manual resulting in limited scalability, 3) the transparency and accuracy is limited in the sense that both tools cannot drill down to the data at product level, and 4) because of the lack of source data and verification capacity, the construction of trusted information is primarily based on human judgment, such as users based assessment in the case of Barcoo or combination of users and experts in the case of GoodGuide. These limitations are arguably affecting the trustworthiness of the information provided to the users. In addition, their inability to integrate information across the supply-chain impacts the validity of their result. In the next section, we will argue for the case of I-Choose as an architecture that could assist web tools such as Barcoo and GoodGuide with increasing the credibility and trustworthiness of the information produced.

Table 1. Comparison of Barcoo and GoodGuide

Indicators	GoodGuide	Barcoo
Information elements & scoring	1 – 10 numeric ratings: General score, Health, Environment, and Social scores	Product background information: Ingredients, nutrients, certifications, price
Data Source	• Over 1,000 third party sources	• Third party providers • Independent sources
Source of Trust	• Comprehensiveness of data sources • Experts and Users judgment • Company image	• Data sources – facts • Legitimacy of partners & their database • Users judgment
Data Problem	• Clarity of scoring • Manual data collection • Human judgment biases • Limited granularity of data • Credibility of data source	• Limited granularity of data • Reliance on 3rd party • Credibility of data source

4.2 I-Choose as an Architecture to empower current tools and trends

In this section, we develop a proposal that could make a contribution to research and practice of ethical consumption.

4.2.1 Main gaps from the literature

Although there is an agreement in the literature that the main consumer concerns are associated with both environmental and social impacts of corporate activities, there is not an agreement on how to measure such impact. Rahman and Post [14] found 15 different ways to define environmental impacts, and different ways to measure them.

Another gap is the difficulty in creating transparent and reliable measures. Data is not equally available for all corporations, and because of that, all available scores require the intensive use of expert judgment, making them highly costly. Moreover, many of the either publicly available or proprietary data are not transparent enough, and do not report on reliability and validity [14].

Research in the area has also shown the importance of labeling in buying decisions [11]. However, labels that certify low environmental or social impacts may present very similar information to the consumer at the point of sale, but use very different criteria or processes in order to get the certification.

Researchers have explored extensively key factors affecting consumer buying decisions, however, we could not find literature on the impacts of the use of tools such as Barcoo or GoodGuide in these decisions. More research in the area is needed. This research may benefit from current efforts on understanding adoption of software to aid consumer decision making [17]. Some of the research that we found suggested that incorporating the cost of externalities in price is yet another way to promote ethical consumption [5]. However, there is little research on ways to account for externalities such as environmental impact. There is still less research exploring the economic impacts of a policy of this nature.

Finally, a potentially important problem with this area of research is the fact that most is looking for ways to promote ethical consumption, without exploring the possibility of consuming less or changing significantly current consumption patterns.

4.2.2 A Pathway Forward: A Socio-Technical System for Opening Private Sector Information to Support Consumer Choice

Our current research suggests that some of the current gaps and shortcomings of tools that support ethical consumption can be addressed by the creation of a socio-technical system such as I-Choose to facilitate information sharing and interoperability among stakeholders in the supply chain [10]. Our current efforts are focusing on coffee produced and traded in the NAFTA region. Coffee producers and consumers have made an effort to attach additional information to specific kinds of coffee –such as organic or Fair Trade—to differentiate them and to allow consumers to make ethical decisions. Lessons from our current project have the potential to be used by other industries and in different geographical areas.

We envision that I-Choose should include at least three different components: a set of data standards to share information across the supply chain, a set of Application Programming Interface (API) standards to make it possible for developers and other interested groups to create specific applications to make this information usable by regular consumers, and a governance system, which will be in charge of creating and modifying the standards over time. We are calling this system the I-Choose system [9].

In terms of the data standards for information sharing and interoperability, we are currently developing an ontology-based set of standards to integrate information from the coffee supply chain. There are already many higher order ontologies or data classifications that can be used to support this interoperability such as the XBRL standard for financial information. Because of that, our focus is on data components that are related to certification, which will link to other data standards.

Shared data promoted by I-Choose will benefit efforts such as GoodGuide or Barcoo by providing better and wider information. However, this kind of ventures will need to have a way to access

the information. Thus, the second component of I-Choose should be an API to ease the development of these kinds of applications.

Finally, those two technical components need to meet the requirements of usability, utility, trust and openness to be widely adopted and used. To accomplish this objective, we believe that a multi-stakeholder group needs to collaborate to set the standards, but also to maintain and adjust them over time. Our current efforts involve the creation of a Network of coffee stakeholders that we believe can constitute a very first group to promote this kind of standards. The group must include government regulators, industry associations, consumers, consumer associations, producers and other stakeholders. The group will need to have in place a series of policies and procedures to ensure the fairness of the process, avoiding standards that become driven only by the larger players in the supply chain.

5. CONCLUDING REMARKS

This paper aims to explore feasible ways of drawing relevant information to fulfill consumers' needs in making ethical purchasing decision. To do this, we explore extant literature on ethical consumption and evaluate two existing tools available to support consumers' ethical consumption. Our exploration identifies some of the current gaps and shortcomings of the existing tools supporting ethical consumption. We then proposed a scalable socio-technical system to facilitate information sharing and interoperability among stakeholders in the supply chain. This system comprises of three different but interrelated components, namely: 1) a set of data standards to share information across the supply chain, 2) a set of Application Programming Interface (API) standards to make it possible for developers and other interested groups to create specific applications to make this information usable by regular consumers, and 3) a governance system, which will be in charge of creating and modifying the standards over time. We are calling this system the I-Choose system. We further call for more attention to the role of government in the management of an architecture such as I-Choose.

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