

# Mobile Applications for Ethical Consumption - Metrics and Frameworks

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**Abstract**—Mobile smartphone applications are becoming available in the service of ethical consumption. Ethical consumption occurs when consumers are empowered with sufficient information about firm behavior to make their purchases in consonance with their own ethics. Such tools vary in the transparency of the data they rely on to deliver ethical information to users, from those based on rich, complex but proprietary data sets, to those based on parsimonious but transparent, public-domain data sets. This paper presents a theoretical framework for understanding the potential impacts of these differences, and provides an example of what the metrics in a transparent, public-domain data set might look like. Such applications have the potential to substantially increase the role of the public in supporting ecology and social justice.

**Keywords**- *mobile computing, smartphones, transparency, ethical consumption, corporate social responsibility.*

## I. INTRODUCTION

Consumer citizenship [1] is becoming increasingly important as individuals seek to consider the impact of their purchasing choices on wider society and the environment [2]. The 2008 ethical purchasing index published by the U.K.'s co-operative bank reports both growing support for ethical products and services, and also large losses to brands due to consumer boycotts. The ethical consumption movement is growing, perhaps not coincidentally at a time of high levels of distrust in business. In the U.S., a 2008 Gallup survey found that 47% of consumers say they have "very little or no" trust in business [3]. A 2009 survey by AccountAbility in the U.K. found that over half the public (56%) say businesses themselves must be accountable for their own behavior, but only 6% of people trust them to do so. This is problem for business, since good stakeholder relations enable firms with superior financial performance to sustain this for longer and help poorly performing firms recover more quickly [4]. Large consumer product organizations have spent billions on branding over the past decade, the primary purpose of which is to build consumer trust. For a public distrusting business, the possibility of collective engagement through ethical consumption offers an alternative path: A market-based approach to achieving the benefits of socially responsible commerce, such as better environmental stewardship and a strong middle class.

Fundamentally, the more that companies practice corporate social responsibility (CSR), the more they will reap the documented benefits of CSR, such as fostering consumer and employee engagement [5], enhancing corporate reputation [6], and increasing profits [7][8].

The increased accessibility of information about global concerns has amplified consumer activism [9]. Controversies surrounding business practices are increasingly disseminated via the internet, resulting in better informed consumers [10]. The Internet enables consumers to overcome many of the information asymmetries that characterize traditional consumer markets, and to obtain high levels of market transparency. Communication technologies enable consumers to more easily act collectively to impose sanctions on firms via exit and voice, and to play an active role in influencing business practices [11]. As a result, increasing numbers of consumers are seeking to engage and influence corporate behavior through their actions in the marketplace, responding to reports of questionable practices such as environmental pollution, child labor, and/or animal welfare abuse. This reflects consumers' understanding that their collective buying power is significant and can exert economic pressure. In one modeling study, economic pressure from consumers on companies and brand owners was found more likely to lead to improved workplace conditions than socio-political pressure [12], and there is no reason to believe this does not extend to other ethical business practices. One of the reasons that there is little research in this area is that until very recently, even the Internet had not made it easy and convenient for consumers to shop with their consciences. Information on corporate behavior available on the Internet is vast, complex, and can be of questionable validity. Such information is rarely easy or convenient to use at the point of purchase, and many areas of consumer concern are characterized by a lack of effective labeling and the "greenwashing" of negative activities by firms themselves. The inconvenience to consumers of applying CSR information to their everyday purchasing behavior has been cited as the cause of the 'values-action' gap, wherein 30% of consumers report that they are very concerned about ethical issues, yet the market for ethically-produced foods remains at 5% [13]. The advent of mobile smartphones is changing this situation, providing convenient, easily accessible information about business practices to consumers at the point of purchase. Smartphones such as Apple's iPhone and Google's Android are poised to significantly alter information asymmetries in consumer markets more effectively than the Internet has been able to thus far. Smartphone users downloaded 2.4 billion applications in 2009, and are predicted to download 7

billion in 2013 [14]. There are currently over 50 iPhone applications in distribution that address the needs of green consumers. For example, Greenopia by Geodetic Systems and GreenMap by Green Map Systems utilize GPS technology such that users can locate green businesses when traveling. Applications such as CarbonCalc by Carbon Harmony, and ClimateCounts provide tools to help users reduce their carbon footprint. What's on My Food by the Pesticide Action Network, Shop No GMO by Mark Rainbow, and Cruelty Free by Symbiotic Software enable consumers to identify which products are free of pesticides, genetically modified ingredients, and animal testing during development, respectively. Such applications are distinguished by the industries, products and practices they provide information about, and by the consumer markets they aim to serve. Almost all are available for free or a nominal fee on the iPhone and will soon be available on other platforms. We refer to these applications as Mobile Technology-enabled Ethical Consumption (MTEC) tools.

Armed with a smartphone and free software downloads, consumers can now swipe the barcode of a product in a store and quickly and easily find out information about the product and the company that produced it. In this way consumers can choose to buy products produced by companies whose practices are consonant with their values. Used en masse, these tools give consumers the power to reward good companies and punish bad ones, using their collective purchasing power to create market mechanisms that motivate ethical corporate practices. In a 2009 BBC News poll of 14,500 people in 15 countries, more than half said they were "active ethical consumers". In the hands of large numbers of consumers, smartphone applications are making previously private information public and altering companies' ability to exploit information asymmetries. Business leaders are noticing this trend: The April, 2010 issue of the Harvard Business Review explains how the new transparency is changing the landscape of business [15]. The impacts of this new technology-enabled consumer phenomenon on society and business are potentially very positive, yet largely unknown. Such positive impacts – public empowerment, increased profits, environmental stewardship, less worker exploitation, sustainable development, etc. – depend on the widespread adoption of the information delivered by these technologies, and the validity of that information. It takes large numbers of ethical consumers to alter market share through ethical consumption. However, the movement is small right now and it is not clear how or whether it will succeed in motivating companies to practice more ethically. This research presents a theoretical framework for understanding differences among MTEC tools, on the basis of the type of data they use to present information to consumers. It then presents an example of a data index that illustrates the potential role that data transparency might play in the adoption of ethical consumption.

This paper is structured as follows: We begin by reviewing prior research in the domain of ethical consumption, and make the case that dual-process theories of human cognition can increase our understanding of this

phenomenon. Next we present our theoretical model, followed by a description of the index that we are working to embed in our MTEC application. We conclude with a discussion of the importance of such applications for furthering ecology and social justice.

## II. REVIEW OF PRIOR RESEARCH

The bulk of the empirical research on the impacts of the ethical consumption phenomenon comes from the marketing departments of business schools. These researchers investigate the effect of corporate social responsibility (CSR) information on consumers' intent to purchase and willingness to buy products produced ethically. Using survey methods, marketing researchers have established that what consumers know about a company can influence their beliefs about and attitude toward new products manufactured by that company [16]. Consumers' positive perceptions of a company's social responsibility have a positive impact on their purchase intent for products produced by that company [17]. Consumers' intention to buy a product increases when the product complies with ethical and social requirements (Fair trade products in this case) and the company has an acknowledged commitment to protect consumer rights and interests [18]. The question of how CSR information affects consumer purchase intent is an important one, and these results are encouraging. However, these studies do not take into account the role of MTEC tools on this process. By making ethical consumption information available at the point of purchase in the grocery store, well-designed MTEC tools can provide accurate, transparent information to consumers in a convenient form – with a swipe of the bar code. This capability is what is *new* about ethical consumption, and why new approaches to understanding this phenomenon are called for. Further, CSR affects both consumers' intent to purchase and their intent *not* to purchase. The marketing research in this domain does not investigate the impact of CSR on non-purchasing, and collective non-purchasing behavior is an important driver for motivating ethical business practices.

For these reasons, and because of the potential for important widespread impacts of MTEC tools on the ecological and social justice practices of corporations, non-marketing-based theoretical approaches to this phenomenon are called for. Our theoretical model applies the widely accepted body of dual-process cognitive theory to the problem of understanding consumer adoption of CSR information via MTEC tools. Dual-process cognitive theories describe the conditions and processes that take place when people accept new information as valid or discount it as invalid. These theories distinguish between two basic ways that individuals' process information: systematically and heuristically. *Systematic processing* involves scrutinizing the argumentation of new information and analyzing it in the context of what is already known, in order to judge its validity. Performing this detailed analysis

demands and consumes cognitive capacity [19], [20]. *Heuristic processing* is defined as the application of learned procedural knowledge structures –heuristics– to informational cues during assessment of received information [20], [21]. In general, both processing modes occur concurrently and exert interdependent effects on judgment [21], [22]. The dual-process paradigm evolved out of the early attitude change research of social psychologists such as McGuire [23]. The Heuristic Systematic Model (HSM) [20], [21] and the Elaboration Likelihood Model (ELM) [19] are the most renowned variants of this perspective. ELM has been widely adopted by marketing researchers in order to understand what makes information most persuasive. However, because the paradigm also applies to validity-seeking processes in general, the dual-process theories have been used to investigate a wide variety of phenomena. Examples include studies of risk perception [24], auditor performance [25], and price search behavior [26]. For understanding adoption of computer-mediated information, Watts-Sussman has investigated information adoption when it is mediated by email [27], [28], online communities [29], voicemail [28], decision support systems [30], and videoconferencing [31]. This research extends this work to the phenomenon MTEC tools.

### III. THEORETICAL MODEL

HSM was developed to apply to validity seeking settings in which people are primarily motivated to attain accurate views consonant with relevant facts [21]. In this study we are interested in knowledge adoption in the context of ethical consumption, and because this is a validity-seeking context, we utilize the theory and terminology of HSM throughout this paper. Such models are particularly appropriate for investigating how people process mediated information, as follows: Systematic processing is relatively unaffected by information delivery medium, since people are able to access argument content regardless of how it is delivered (i.e., email and face-to-face do not differ significantly in their ability to deliver *explicit* content). However, available heuristics can vary widely across mediated communication modes. Heuristics are informational indicators other than the content itself that people use to assess content. A potentially infinite number of these heuristics exist in interpersonal communication contexts [32]. For instance, in groups people are influenced by consensus cues and attributes of the group leader such as charisma. Individually, people often use heuristics pertaining to an information source, and can be influenced by an information source's attractiveness, likeability, and credibility [19]. While face-to-face interaction provides the many peripheral cues that enable us to establish a shared context [33], we know that peripheral cues do operate in computer-mediated contexts [34]. For example, people use cues to delete e-mails they receive without scrutinizing the arguments they contain or even reading them at all. Because it is a widely accepted body of cognitive theory

that has been successfully applied to computer-mediated communication contexts in the past, this research uses the HSM to investigate information adoption processes in the context of ethical consumption. The model in Figure 1 below from Sussman and Seigal [27] was used to show that the process of email-mediated information adoption follows the dual process paradigm, such that source credibility functions as a peripheral cue and affects the perceived relationship between argument quality and information usefulness, ultimately affecting information adoption.

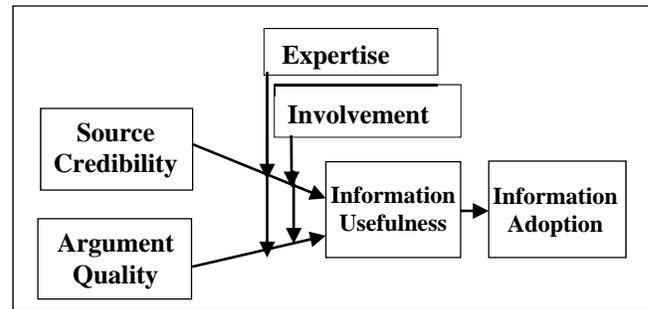


Figure 1. Information adoption of email-mediated advice

This theoretical framework is appropriate for understanding the process of how people adopt the information delivered to them via MTEC tools:

- Information adoption is positively associated with information usefulness.
- Perceived information usefulness is a function of both the systematic processing of argument quality and the heuristic processing of source credibility cues.
- The relative influence of argument quality and source credibility is moderated by both the information recipient's domain expertise and his involvement in the information topic, consistent with the dual-process theories.

However, this model does not help us distinguish between tool designs. It is important to do so, since the design of these tools embeds in them availability of certain heuristics, which in turn affects how the information they provide is processed by the user. In order to adapt this body of theory to technology-mediated ethical consumption, we propose that the construct of data transparency is particularly important in this context, providing a means for distinguishing among different designs of these tools, and therefore should be included in the validated model of information adoption above. *Data transparency* – the degree that the user is able to self-validate the information provided by the tool – increases source credibility. Data transparency is a technical design factor that designers can optimize in the tool, or not. To the extent that the user is able to independently confirm the validity of the information provided by the tool, the source of the information is more credible than if the user is not able to independently confirm its validity. Thus:

P1. Higher data transparency is associated with higher source credibility, which is in turn associated with higher information usefulness and adoption.

P2. Information provided by MTEC tools with higher data transparency is more likely to be adopted by users than information provided by tools with lower data transparency.

P3. This effect is likely to be more pronounced among users that are less trusting of online information validity.

The dominant MTEC tool in the United States is GoodGuide. For its data source, GoodGuide uses the output of research and analysis firms produced for the purpose of socially responsible investing. The data sets created by these companies are extremely thorough; many are based on over 600 indicators. Such extensive research and analysis is expensive, and the companies that create them sell these data to institutional investors who can afford to pay high subscription fees. Because they are expensive to create and maintain, these data sets are proprietary, which reduces the data transparency of the MTEC tools delivering information based on these data. In order to produce MTEC tools with high data transparency, we propose the creation of metrics based on non-proprietary data, analogous to the concept underlying the United Nation's Human Development Index (H.D.I). The H.D.I. ranks countries according to only three simple indices: a nation's G.D.P., its citizens' education, based on adult literacy and school-enrollment data, and its citizens' health, based on life-expectancy statistics. The advantage of the H.D.I. is its transparency, parsimony and corresponding simplicity, but this simplicity comes at a sacrifice of data richness and nuance, a limitation that H.D.I. researchers are working to address. We suggest that a parsimonious, transparent index of CSR behavior can be developed that will increase user adoption of the information provided by MTEC tools. Below we propose one such index based entirely on data in the public-domain. Note that it applies to publicly held corporations only, since privately held companies are not required to disclose some of the metrics that the index is based on.

#### IV. TRANSPARENT CSR INDEX

On the basis of data availability, we suggest three sub-metrics for this index: unproductive spending, environmental sustainability, and local job creation. First, corporate spending patterns indicate the capacity of a corporation to internalize costs that it has externalized to society and the environment. Companies that spend their earnings wisely have more funds available for improving environmental and social performance than do spendthrift companies. For this reason we identify four categories of large business expenses that are widely accepted in the corporate world, but that common-sense and history suggest are unproductive use of funds: excessive advertising, excessive long-term debt, high executive salaries and bonuses, and government lobbying. In most developed countries, these data are publicly available in financial

reports that public corporations are required by law to file. Most large corporations are headquartered in these countries, since they tend to have stable economies. For example, according to this sub-metric described in detail below, the Kraft Corporation spent \$1.5B in 2009 on unproductive spending in these four categories, but only made \$3B profit on \$40.4B in sales revenue. Thus for this company, unproductive spending amounted to about one half of its 2009 profits, and suggests that if companies were to cut back on these unproductive expenses they could afford to do the right thing by their workers, communities, and the environment.

##### A. Metrics of Unproductive Spending

While all companies need to advertize, a number of corporations spend more than half their profits on advertising. Socially responsible companies of the future will choose to spend less on advertising and PR, choosing instead to spend these dollars on things like good wages and benefits for their workers, environmental management systems, philanthropy, etc. This has the direct effect of doing good works, and also the indirect effect of generating positive perceptions of the company, which in turn drives sales. Nor does advertising get high grades for its impact on society in general and on children in particular. Advertising affects our cultural understanding of what is valuable and can fuel materialism, consumption, superficiality, and insecurity [35]. Advertising to children can create frequent conflicts for families when children pressure their parents into buying things that they can't afford, exacerbating the debt burdens of working families. For these reasons we contend that spending *excessively* on advertising and PR is an unproductive use of corporate earnings, relative to the environmental and social good that could come out of spending those funds more wisely. Thus one metric of this proposed spending index is the amount that a corporation spent on advertising the previous year as listed on their 10K, above an amount equal to 20% of the profit they reported that year. This is an arbitrary designation reflecting the value judgment that spending more than 20% of profits on advertising is unproductive relative to other potential uses of those funds.

Another area that U.S. companies spend trillions on annually is debt financing. Corporations take out loans to finance things like new buildings and production facilities, company acquisitions, and stock buy-backs, and then pay interest on these loans. Clearly, such borrowing is necessary and desirable, to a point. However, companies that borrow *too much* spend unproductively on interest payments. High levels of debt financing constrain managerial choice because interest on this debt must be repaid on a contractual schedule. Companies with high levels of debt do not have the financial flexibility to react effectively to unforeseen costs, for example the costs of an environmental accident or new labor demands. Socially responsible companies keep their debts to a reasonable level so that they can pay them

off without having to cut spending in other important areas. Consumers and governments work to practice restraint in accumulating debt, and well-governed corporations do likewise. The value of limiting to a reasonable level the amount of debt a corporation takes on seems self-evident to those outside of the financial industry: if consumers and governments are expected to practice such fiscal restraint, it seems reasonable to expect corporations to practice it as well. Thus the second metric of our index uses the ratio of long-term-debt to capitalization. Capitalization refers to how much the company is worth on the stock market and so is an indicator of net worth. For the purposes of this index, and based on conversations with financial experts at ethical investing firms, we suggest this ratio shouldn't be higher than 20%. Clearly startup companies naturally need higher debt margins, but this metric is for large established corporations that have already grown to a massive size. Thus we count 5% of the long-term debt that exceeds this ratio, as an approximation of the costs to finance this excessive debt. Note that this figure does not include funds spent on research and development, so this metric should not impede the corporate capacity to innovate.

It is widely acknowledged that many companies spend large sums paying their top executives disparately large salaries and bonuses. This occurs regardless of whether the firm is currently laying-off workers, cutting benefits, or paying subsistence wages. Clearly top executives should be paid well, but there are negative consequences to the organization when they are paid hundreds of times more than their employees. High levels of executive compensation are associated with high employee cynicism, which in turn reduces employees' organizational citizenship behaviors and increases the chances that they will agree to engage in unethical behavior such as workplace sabotage (Andersson & Bateman, 1997). Indeed, wide disparities in corporate pay scales can directly and adversely affect the value of the firm (Thomas, 2003), due to a variety of effects such as lower employee productivity, higher turnover, and higher absenteeism. Thus companies that pay their executives disproportionately not only incur the direct costs of paying these high sums, but also a variety of indirect costs that can have a negative effect on the bottom line. For these reasons, we suggest that companies that pay *unreasonably* high levels of executive compensation are spending this money unproductively, since this money could be more productively and responsibly spent in other ways. Thus the third metric of our spending index is total the amount paid out to top executives in compensation and bonuses the prior year, above \$3M for each executive, as listed on the Summary Compensation Table of the DEF 14A Proxy statement that corporations are required by law to disclose. This is an arbitrary designation: Many executives may view \$3M as a paltry salary, but their employees earning \$15 per hour would probably find it acceptable. More research needs to be conducted on what an optimal amount would be, one that is high enough to attract and

retain leadership talent, but not so large as to incur the negative effects on employees and firm value discussed above.

The final area of unproductive corporate spending that we propose for this index is government lobbying. Corporate revenues exceed the GDP of most governments. In the U.S., companies spent \$3.49 billion on Federal lobbying in 2009 [36], an average of over \$6.5 million per congressperson. Clearly this gives corporations a lot more power to influence what legislation gets implemented than most individuals have. The governments of the European Union, Scandinavia, Brazil and Japan all do a better job of protecting their citizens from the effects of cost externalization than the U.S. government does [37], partly because they have stricter controls on lobbying. Companies that spend excessively on lobbying are using their financial power to influence legislation, a practice that Adam Smith and many other organizational theorists since are against. Lobbying is not a productive use of earnings relative to other socially responsible spending opportunities. Thus the final element of our proposed spending index is the total amount a firm spent on Federal lobbying the prior year, which companies are required by law to disclose. This has the disadvantage of not accounting for the size of the company. However, when politicians vote in congruence with lobbying efforts, it is the total dollars spent that are influential, regardless of company size.

According to this proposed metric of corporate spending, the 2009 Kraft corporation example above breaks down to \$1.04 billion spent on excessive advertising, \$431 million spent to finance excessive long-term debt, \$37.1 million on excessive executive compensation, and \$3.39 million on Federal lobbying, for a total of \$1.52 billion dollars. This is a lot of money, relative to the \$3,021 million in profit they made the same year, and certainly could have been spent in more socially and environmentally productive ways.

#### *B. Non-financial Indices in the Public Domain*

Public-domain indicators of a corporation's environmental record and sustainability initiatives are obvious candidates for such an index, although they vary according to local regulatory requirements. The U.S. government-mandated Toxic Release Inventory – toxic releases plus toxic wastes – reflects a transparent indicator of corporate environmental behavior that is in the public domain in the United States. Another indicator we might include in this index addresses the issue of job off shoring and the deleterious effects it is having on the economies of more advanced countries. As the economies of many wealthier countries become increasingly bifurcated due to reductions in the size of their middle classes, fewer and fewer citizens have the financial resources to use anything other than price to inform their purchasing decisions. This situation supports and maintains those companies that produce cheap products by taking advantage of lax

regulatory oversight in lessor developed countries (LDCs). It also has deleterious consequences within the economies of developed countries as increasing rates of poverty give rise to higher levels of crime, domestic violence, underground economies, and corruption. We use the United States to describe a proposed metric comprised of two ratios, but it is applicable to any country: For every million dollars spent by Americans and recorded as U.S. sales by a corporation (i.e., U.S. sales), that corporation supports X jobs in the U.S. For every million dollars spent by non-Americans as reflected in non-U.S. sales reported, this corporation supports Y jobs. The ratio of X to Y shows the extent that the company supports more jobs overseas than they are in the U.S., for the same sales dollars spent by consumers, where the lower this number is the better. The higher this number, the fewer U.S. jobs the company supports per dollar of U.S. sales. For example, companies whose sales are primarily generated in the U.S. and who locate their jobs primarily in the U.S. will have a very low score for this. Companies whose sales are generated in the U.S. but who rely heavily on foreign labor will have a very high score on this. This data is publicly available since corporations are required to release it for tax reporting purposes.

A final metric that we would like to see in this index would be a measure of supply chain transparency. This is an extremely important issue for development policy, since most of the environmental and human rights violations by businesses in LDCs are perpetrated not by large corporations themselves but by their smaller local suppliers. Often we have accurate information about what local companies are doing, but since transnational corporations are not required to disclose their supply chain partners, they cannot be held accountable for these violations. And while many of the large multinational corporations have policies that ostensibly prohibit them from trading with unethical suppliers, it is very difficult and expensive to monitor supply chains effectively. For this reason, until we have mandated disclosure of supply-chain partners, we lack a public-domain metric in this important area.

## V. CONCLUSIONS

The emergent phenomenon of MTEC tools have the potential to fuel widespread ethical consumption, where consumer choices in aggregate provide a market-based mechanism for motivating corporate social responsibility. But, the achievement of this potential depends on widespread adoption and use of the information provided by these tools. This research contributes a theoretically-driven model for understanding the important role that data transparency can play in designing MTEC tools for optimal adoption. In service of this model, we propose a parsimonious, non-proprietary index of corporate social responsibility that consists of three sub-metrics – unproductive spending, environmental sustainability, and local job creation. We hope to encourage debate and

discussion about both the idea of such an index, and what an optimal form of it would look like. We hope that, over time, firms will see the value in improving their performance in areas measured by this index. In this way, MTEC tool-supported ethical consumption can become a significant driver supporting the needs of civil society.

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