

I-Choose: Consumer Choice, Digital Government, and Sustainability in North America

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1.Introduction

“Political leaders are facing a headache this week as they begin negotiations on new rules governing how our food is regulated. The unprecedented talks will be conducted within the framework of the American Free Trade Area (AFTA), a free trade agreement ratified by all the countries of the Western hemisphere. The summit comes amid a period of sustained attention to the safety and ethics of the food we consume. As the price of handheld devices such as Smartphones and tablets has decreased, more and more people have taken advantage of consumer reporting, peer review and social media to check up on what they buy....Trade experts say that this is the biggest challenge faced by the trade block since its formation in 2016, and the results of these negotiations could drastically change the information policies and standards that govern supply chains around the world.”

-Excerpt from ‘Trade Regulation in a Future-Possible World’, I-Choose Network Case Study, July 2011.

Technology-led innovations produce big, transformative change in key sectors of the economy that have lasting impacts on our daily lives. The ATM card transformed banking. Facebook has changed how a generation views social interaction. The National Digital Library will change forever the nature of both research and public libraries. Similarly, the advent of Full Information Product Pricing systems—pricing regimes which allow consumers to overcome information asymmetries and get more information about the products they want to buy—will transform the nature of government regulation of consumer markets (Whitmore et al., 2010).

Recent technological changes, including RFID tagging and other better product tracing methods, social media, and the proliferation of Smartphones, make it easier to map supply chains, extract information about them, and discover more about the conditions under which a product was produced. The supply-chain ‘black box’ is slowly becoming less opaque. It is now increasingly possible, through online interactions between consumers, producers, product certifiers, retailers, and advocates, to make more of that information available to the public. Consumers can ask and quickly receive answers to questions such as: “where was my product made?”, “under what working conditions?”, and “how much of an environmental impact did that manufacturing have?”

For commercial actors, this presents the opportunity to add value to their products or otherwise differentiate them from competitors’ brands in a crowded marketplace. For active consumers, this presents the opportunity to shop according to their values and exert greater pressure on the marketplace to meet their demands. Our wider research project addresses the implications of new product traceability technologies for these actors (<http://www.ctg.albany.edu/projects/ichoose>).

In this paper specifically, we address the challenges and opportunities that this new ICT poses for governments, and begin to outline some potential solutions. Governments in North America have set explicit goals to increase the environmental sustainability of their infrastructure, promote sustainable local economic development, protect consumer health, promote nutrition, or establish greener, more efficient supply chains.

These commitments are real, and substantial, but the information problems found in real markets have, until now, made many of those goals more elusive. Cross-border markets for

many products are opaque, regulated by complex systems of state and non-state rules and certification schemes. While producers hold a great deal of non-price information about their goods, consumers cannot access this information. They must rely instead upon third parties to verify certain product characteristics through an increasingly complicated set of labeling schemes. This proliferation of product labels and categories, in turn, reduces consumer trust in sustainable products. Recent rapid developments in technology, however, present big opportunities for policymakers who want to address this lack of trust and achieve their sustainability goals via smarter regulation.

This paper presents observations from research sponsored by the National Science Foundation (through its Community-based Interoperable Data Networks Program), the Consejo Nacional de Ciencia y Tecnología (CONACYT-Mexico), and the Canadian and COMEXUS Fulbright Commissions.¹ Our interdisciplinary and multinational research team blends approaches from digital government research, public policy analysis, and system science to investigate new ways of combining traditional regulatory tools with crowd-sourced information from stakeholder networks. Together, we ask how rapidly improving technologies for collecting and managing detailed product information can form an evidence base for new forms of regulation and governance.

Our focus for this project is coffee grown in Mexico and sold in Canada and the United States, giving our project a relatively tight research boundary via a product with fairly advanced product labeling and clear inspection standards, yet a diverse set of political contexts. Although we focus on coffee, we believe that our findings are applicable to a broader range of market regulation. Our ultimate goal is to make the best practice developed through this project available to a broad range of scholars and practitioners who are addressing information-centric public policy challenges.

The results presented in this paper are drawn from our project's broad evidence base. The first source of evidence is a review of existing FIPP systems to establish their online presence and the standards they require. This included analysis of existing proprietary FIPP schemes operated by retailers, and a review of existing non-governmental certification schemes for fair trade, organic, and shade grown coffee. We reviewed government regulation of coffee in the NAFTA region, also drawing on previous research carried out by members of our team on trade regulation and non-price information in the United States and the European Union.²

The second set of evidence comes from four case studies of existing proto-FIPP regimes in Canada, Mexico, and Central Americas—cases where producers are putting in place systems to reach their customers directly and provide them with more information about their products.

- Serres Natures Jardin (SJN; <http://jardinsnature.ca/francais/>), a small firm from the Gaspésie region of Canada, which produces certified organically grown tomatoes,
- Agri-Traçabilité (ATQ; <http://www.agri-tracabilite.qc.ca/index.php/en/>), an autonomous non-profit organization subsidized by the Québec government, which helps beef and sheep producers to install traceability systems in their farms since the adoption of Québec's regulation respecting the identification and traceability of certain animals,
- Tosepan Titataniske (<http://www.uniontosepan.org/>), a cooperative in the northern mountains of the State of Puebla, Mexico, which produces and exports organic and fair trade coffee to Japan, Europe, and the United States, certified as an organic/fair trade coffee producer by Fair Trade Mexico, Certimex, Ocia International and by the Fair Trade Labeling Organization (FLO), and

¹ US-NSF (Grant No. IIS-0540069), CONACYT-Mexico (Grant No. 133670).

² This research was supported by the University of London central research grants scheme.

- Unidas para Vivir Mejor (UPAVIM, <http://upavim.pursuantgroup.net/>), a women-owned cooperative in Guatemala, producing non-traditional crafts using traditional fabrics for export to fair trade outlets in North America and Europe.

Each case study included a literature review, document analysis, and semi-structured interviews with producers and certifiers (see Luna-Reyes et al. 2009).

Third, we use feedback and commentary from our “I-Choose Network,” a focus group of experts drawn from retailers, certifiers, NGOs, ICT specialists, government regulators, academics, and consumer advocates across the three countries. The research team used supply chain exemplars and case study data to test the group’s understanding of current and potential FIPP systems, and draw out the policy implications of such systems for each type of actor. The I-Choose Network will continue to meet on a regular basis throughout the duration of our three-year project, with two main goals: as an experiment in creating a trust-based collaborative space between actors with disparate interests and goals, and as a forum to provide and refine practical ideas about necessary technological and policy solutions.

The paper proceeds as follows: we first explain the technological changes that are altering both how markets operate and what information available to the consumer. Second, we introduce the basics of an “I-Choose” system that can take advantage of these trends and explain how such a system would relate to various actors throughout the supply chain. We next discuss how such a system might be governed, and finish by discussing some preliminary policy options.

2. Technological Change and Consumer Markets

In an ideal world, it would be easy for a consumer to pick up a product and understand instantly exactly what it would do to her health, how it relates to workers, or what its carbon footprint is. A consumer could easily visit the field where a product was grown or the factory where it was manufactured, meet the workers and producers face-to-face, and ask them important questions. She would be able to chart each stage of the production process to get a complete understanding of how her purchasing choices are affecting society and the planet.

But the real world is unfortunately much more complicated. The consumer picking up a product in a shop, or purchasing it online, cannot observe directly many of the product’s characteristics that might be interesting. Nor is it easy for a consumer to establish what the impact of a purchasing choice will be. Consumers must rely on third parties—whether it is the producers themselves printing information on their packaging or marketing their “green” credentials, retailers putting up signage in the store, certifying organizations allowing companies to use their logos, or government regulators requiring information to be released. This is a modern depiction of the classic information asymmetry that sits at the heart of all markets—consumers often have no way to directly observe if they are purchasing the product they truly want or are getting stuck with a “lemon” (Akerlof 1970).

Perhaps our consumer—motivated and tech-savvy—would not be deterred by this setback. Perhaps she would spend time and effort online, trying to find the data. But the reality is that even the most dedicated consumer, deciding to gather this information for herself, would face considerable roadblocks. Data about production processes, environmental impacts, and supply chains do exist, but are highly fragmented and difficult to access. Some of these data are proprietary and private. Some are public, but may seem incommensurable—exhibiting no standards for appropriate comparison. All of it is time-consuming to compile, even if our super-

consumer has all of the knowledge and skills she needs to gather and process them. Perhaps this is a cost she is willing to pay for a rare, once-in-a-lifetime purchase, but not really practical for everyday purposes.

Despite these difficulties, five trends are moving us—albeit slightly—closer to our ideal world. The first is the proliferation of mandated and voluntary labeling schemes. Product labeling is a trend designed to return more information to consumers about the products they purchase (Caswell & Padberg 1992). Government-mandated product labeling such as FDA content and nutrition labels or USDOE “Energy Star” ratings are examples of using information standards to supply a uniform and presumably trusted package at the point of purchase. Other government-sponsored voluntary standards such as USDA “Certified Organic” or Appellation Contrôlé marks (more common in the EU) provide government-backed certification of the terms and conditions under which foodstuffs were produced. Some voluntary standards such as “Fair Trade” or “Shade Grown” coffee are backed by private organizations or coalitions of NGOs, who carry out inspection and certification of producers on the ground. Each of these labeling schemes aggregates a great deal of data—information that could be even more powerful if aggregated.

A second recent trend focuses on the proliferation of local or artisan production methods and their associated supply chains. In these supply chains, producers wishing to emphasize how or where their products (often foodstuffs) were produced engage in special marketing efforts such as farmers’ markets or artisan-only shops. Customers are willing to pay a premium for the information about the sources of their purchases. Many more consumers want to know exactly where their food, and other products, came from, and how they were produced, and are willing to pay more for peace of mind.

A third trend is related to product traceability (Hobbs 2004). In some cases, product traceability is becoming a requirement for exporting or marketing products because of known health hazards as in the case of beef, pork or veal (Eamich 2007). Recognizing the huge economic costs associated with product safety scandals and associated bans on certain goods, governments are paying attention. The European Union introduced region-wide food traceability regulation after the high profile scandal over BSE (“mad cow disease”) and debates concerning genetically modified products. The US is also attempting to assert greater control over food contamination through the recent Food Safety Modernization Act. In other cases, traceability has been implemented as a tool to certify the authenticity of luxury goods. This trend has pushed the development of conceptual frameworks and the use of information technologies such as bar codes or radio frequency identification (RFID) to produce information systems (Regattieri et al. 2007).

A fourth trend uses web-based techniques to bring information to final consumers about how, where, and by whom a product was created. Online sites and downloadable apps for devices provide rapidly accessible ratings on various environmental and social scales. Good Guide (www.goodguide.com), for example, provides health, social, and environmental ratings from a panel of scientific experts for a wide range of products, and publishes its methodology online. Other existing apps permit customers to learn more about their product’s supply chain, such as Know Your Farmer, which allows users to enter a unique code identifying their coffee purchase to learn details of the farmer who grew the coffee beans (www.knowyourfarmer.com), or the Boston Tea Campaign’s traceability app, which returns information about the exact production and shipment of individual packets of Darjeeling tea (www.bostonteacampaign.com/traceability/). In terms of identifying and promoting sustainable companies, systems like B Corporation’s corporate certification scheme (www.bcorporation.net) are taking huge steps forward in not just requiring high levels of corporate responsibility, but improving it in the legal foundations of the companies themselves.

Supporting these online systems, a last important trend involves the extended use of mobile devices and the development of a large number of applications for them, ranging from games, to social networking to information and productivity applications. Even the cheapest devices allow users to access the Internet and manage multi-media information.

Taking these trends into account might make us a more optimistic about improving information asymmetries in consumer markets. Labeling schemes tell us that data about product sustainability is consistently being gathered and verified. Innovation by local and artisanal small businesses demonstrates that markets exist for creative products, even in economic hard times, and that it is possible to obtain price premiums by providing consumers with this extra information. The creation of government and technological frameworks supporting traceability increases the likelihood that sustainable goods are produced on a bigger scale. And finally, we can only expect online product ratings systems and mobile devices to increase in number and sophistication.

All of this suggests that we are at a critical juncture in terms of the possibilities for promoting a green economy with sustainable purchasing, procurement, and growth. Our project, “I-Choose” focuses on how these strands can be brought together, and how this aggregation can be supported by an appropriate system of governance. Before discussing governance options, the following sections introduce in basic terms how such a system would relate to various actors in the supply chain.

3. I-Choose: Technology to Support Full Information Product Pricing

We believe that it is possible to take advantage of these trends. In this section we imagine a future-possible “mash-up” of these already existing features, an “I-Choose” Full Information Product Pricing system. This ideal type would be enabled by cutting-edge technologies such as the semantic web, Web 2.0 social computing systems, mobile apps and standards-based interoperability that would allow large scale systems to be built in an open source environment that still retains many of the desirable features of smaller scale, even face-to-face, systems.

I-Choose would be driven, and supported by, a number of social forces. An invigorated network of consumer advocates supported by innovative forms of government regulation and a redefined environment of accountability and transparency will lead to the development of scalable systems that retain trust while achieving ease of adoption and use by end users. A new generation of socially responsible organizations will be figuring out how to use the public drive for accountable, transparent, and sustainable systems to create new opportunities to secure market share and return profits to shareholders.

The point of this exercise for the purpose of this paper is not to sketch out in technical detail a fully-functioning, perfect system—many communities of active and entrepreneurial developers exist (including those working on this through our I-Choose Network) which are better suited to that task. Rather, we aim here to explain the roles of the various actors who would be involved in such a system and the difficulties they face, using these functionality and use considerations to inform our subsequent governance discussion.

We follow the story of Ellen Richardson, a careful mom who uses I-Choose to buy coffee for her family:

Ellen Richardson has always considered herself to be a careful shopper. Living with her husband and three children on a limited budget, it has always been a struggle to make ends meet while at the same time striving to make purchases that reflect her personal commitments to social justice and environmental sustainability. This is why she was the first

in her network of friends to download the I-Choose app to her phone. She simply scans the IPC sticker on products she is interested in, and information about how and by whom they were produced is delivered to her. I-Choose allows her to create her own value profile so that product ratings she has previously provided reflect her personal preferences; creating a price-value rating that she can tailor to meet both her budget and her values. In the past, Ellen was one of those shoppers who paid more attention to the unit pricing label than the price itself. Now the I-Choose rating augments unit pricing with value pricing. Today, as Ellen shopped for coffee in the Fair Trade and Organic shelf in her local supermarket she was surprised that her I-Choose scan revealed a new product on the shelf that made an even better price and value fit for her. She probed the I-Choose profile on that product by drilling down with several clicks. Ellen found out that the product, in addition to being distributed by StarCents, a coffee distribution firm that is excellent at holding down shipping and distribution costs, is also shade grown at the Valesquez Coffee Cooperative in Mexico, with much a much higher environmental sustainability index at the point of production. Two more clicks confirmed to Ellen that the Valesquez Cooperative has been certified by the United Fair Trade Association (UFTA) and is well-rated by the Consumer Values Institute, an online social network of consumers who share Ellen's values. Ellen picked up this new brand and dropped into her cart to give it a try.

3.1 How the I-Choose System Works from a Consumer's Point of View

Ellen is concerned about all of the attributes of her coffee that she can discern directly by inspection in the supermarket: cost, quality, degree of roast, and other product features such as packaging, and visual appeal. However, Ellen may also be interested in a number of other unobservable attributes of her coffee—features that are not known to her but are known within the supply chain and not brought to the marketplace. She seeks more information by asking questions such as: How was her coffee grown—organically or locally? Was the farmer paid a fair wage? Do the workers who processed her coffee get health care benefits? What is the environmental impact of the coffee's production? Ellen is one of the consumers who is willing to pay a price premium for coffee that is produced in ways consistent with her values.

The goal of the I-Choose system is to provide information about coffee producers and the coffee supply chain to Ellen as she seeks answers to the above questions. The I-Choose system has three basic operational components. First, Ellen will be shopping with a hand-held shopping support device such as a smart phone. Ellen will be able to scan the UPC code of her purchase so that her smart shopping device can uniquely identify the product. Her smart phone device will then connect to the Internet and look up information on her chosen product, using an advanced consumer preference application to sort through the information packages available for each uniquely-identified product in order to do true comparison shopping.

The second component of the I-Choose system is a standards-based product information data architecture. It will allow multiple stakeholders to seamlessly exchange data in order to assemble in real time an information package describing the details of Ellen's coffee purchase.

The final major component of the I-Choose prototype system is animated by the power of Web 2.0 social computing platforms to produce trusted and easy-to-understand information. Conflicting certification and verification structures will undoubtedly complicate the decision processes of ordinary users when sorting through vast amount of information. Consumer advocates will fill the gap by establishing peer-ratings systems that pour over data, and arriving at peer evaluations to be disseminated to ordinary consumers who share values with the consumer advocate organizations.

3.2 How the I-Choose System Works from the Point of View of Supply Chain and Certification Organizations

Ellen Richardson, our hypothetical customer who is now doing most of her shopping using the I-Choose system, provides a powerful economic motive for retailers, producers—indeed for everyone in the supply chain to get involved in providing her with the information that she seeks.³ Third party certifiers have embraced the I-Choose information standards because their development is based on the agreement of communities of consumers, producers, supply chains, and government regulatory agencies. These standards provide a cheap, reliable, broadly adopted, and government-sanctioned way for certifiers to deliver trusted certification information to a widely-dispersed customer base.

A small industry of consumer advocates has sprung up that provides a host of integrated indices, indicators, endorsements, and sanctions for specific products that are easy for Ellen to use and interpret. An information marketplace has arisen providing Ellen with many competing, value-driven indicators. No matter what Ellen's values are, there exists an information aggregator who is trying to draw her attention to his or her product rating scheme—all of which become possible because of the existence of a common I-Choose information architecture.

Internal to many major multinational corporations, the Corporate Social Responsibility Officer, working closely with the marketing department, has played a major role in bringing corporate information systems into compliance with I-Choose information standards. Many large corporations have set up new product lines that cater to the values of segments of their customer base. Increasingly, corporations are paying more attention to the working conditions within their supply chains and the impact of their production processes on the environment. Transparency has become a corporate byword of increasing value as consumer advocates continue to inspect and confirm or disconfirm in very public ways (with consequent impacts on market share) information made available using the I-Choose information standards. In some cases, marketing campaigns have sprung up that are sponsored by logistical and support organizations within the supply chain, and retailers have become more willing to stock their shelves with products defined by conditions in the supply chain in addition to traditional price and quality considerations.

3.3. How Do Individual Organizations Interact with I-Choose in an Integrated Way?

One of the beauties of the I-Choose system is that Ellen really does not need to understand in any great detail how it works any more than she needs to understand how her hybrid automobile or PC works. She does not need to understand it as an information technologist does. Rather she needs to understand it at the level of someone who knows how to use typical mobile or Web applications.

Of course, a major problem with this simple view is understanding how any given organization can connect without compromising the design and proprietary information housed within its own information systems.

³ For example, in our recent survey of prices at local retailers in the Albany, NY area, the price per pound of coffee ranged from a low of \$2.47 a pound up to \$13.00. While some of this variability is due to discernable taste and quality differences, most of it can be attributed to the presence or absence of labels such as “Fair Trade,” “Organic,” or “Shade Grown.” The higher prices were uniformly associated with these labeled coffees. At least for coffee, information about what happened in the supply chain has great economic value.

Fig. 1: Mapping a Proprietary Database to Open XML Standards for Information Sharing

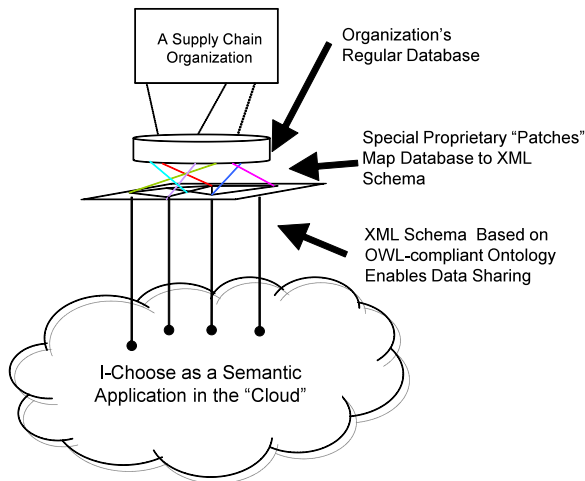


Figure 1 gives a hint of how this contradiction between the Internet needing standardized information and an organization's need for a customized architecture can be initially resolved. The key to understanding how this all works is to recognize that there is no need to change the way that the existing information systems operate for any organization in the supply chain. Its information systems do not need to “talk” directly to other organizations' information systems on the Internet. Rather, some abstraction of its databases is made available on the Internet by mapping its proprietary data architecture to an open XML schema-based standard. This approach has the effect of enabling interoperability through a common data architecture and enabling the shielding of private corporate or customer information. This idea is really quite common. As early as 2010, most businesses have made an abstract of key information about their products, services, and terms and conditions of services available on the Internet using HTML—we call this a “presence on the Internet.” XML is a powerful and popular language for data organization and sharing that integrates well in this existing HTML environment.

The tricky part about Figure 1 is that the XML schema, or the rules that govern the structure and format of the XML documents, must comply with commonly used and internationally recognized information standards. For example, the Universal Product Code (UPC) is a global industry standard for indexing all types of products using the now familiar product scan bar. If a retailer or wholesaler chooses to use some other product code, its system would not be I-Choose-compliant.

Hence, the structure in Figure 1 implies that all organizations that use the I-Choose standards must (1) have some sort of an automated information system that can be “hooked up” to the Internet, and (2) their inventory, sales, and shipping systems comply with pre-existing information standards.

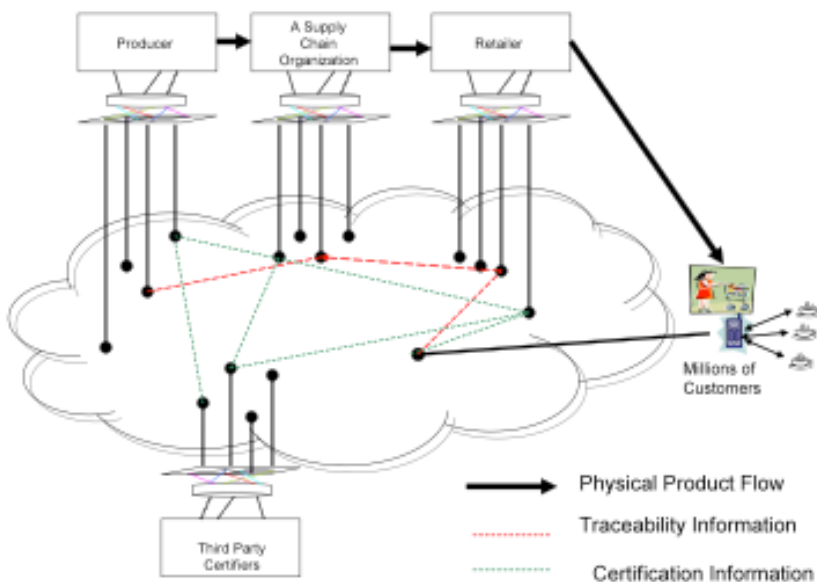
If these two big conditions are met, every organization also needs to meet a small third condition. Each organization needs to make its I-Choose formatted XML data publically available on its web space. Special proprietary “patches” need to be designed to map their regular information systems to the standards-based XML schema. We say a “small” third condition because as more and more businesses become interested in using I-Choose standards (to capture a share of Ellen's business) all firms that provide commercial inventory, shipping, and sales information will, because it is in their best economic interest, also provide this XML data as well (so that their customers can fully evaluate their products). This is also to

the benefit of supply chain organizations because they are better prepared for vertical integration to speed up the flow of information, products, and cash. Adopting I-Choose information standards provides the producers, distributors, shipping centers, and retailer the means to link to other organizations in a timely manner without the need to build connections one at a time.

3.4 What Happens When Ellen Launches an Information Query?

As Ellen seeks to buy the coffee that best matches her personal price, quality, and value, she uses her hand-held computing device to launch a query that makes use of a modified type of Internet search engine. (Google first released its commercial version of these shopping support tools in 2016.) As illustrated in Figure 4, each of these shopping support tools has two basic functionalities.

Fig. 2: Tracing a Product Back to its Source to Check Endorsements and Third Party Certifications



First, as illustrated by the red dashed lines in Figure 2, the shopping tool can trace back a product from point of purchase to point of production. The ability to complete this function is created when all organizations in the supply chain provide a basic abstract of their shipping and receiving relationships. The shopping tool seeks information from the retailer that sold Ellen her product and queries it concerning from whom the product was received. Then the shopping tool moves up the supply chain using a sequence of “shipped to” and “received from” relationships to reconstruct the supply chain that delivered her product (in this case coffee) to market. In order to increase the accuracy and reliability of this source tracing information, another type of information aggregator industry has emerged that has created more integrated source databases by continuously “crawling and trawling” through available Internet data to create more accurate and easy-to-access source traces.

The second functionality of Ellen’s shopping tool connects certification information to product and supply chain information. This functionality is abstractly represented by the green

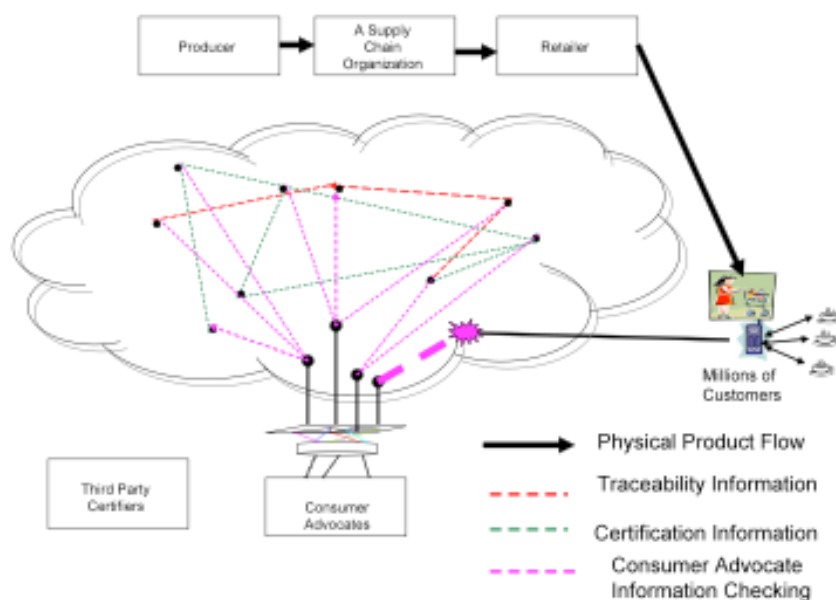
dashed lines in Figure 2. Using a system of transparent and verifiable certification documents, certain previously sanctioned third party certifiers (such as government agencies or NGOs who themselves have become registered to be certification providers) have inspected the production facilities and logistics facilities used to manufacture and transport materials, and have attached their certification information to the product. This functionality was first created for food products and was slowly expanded during the second and third decades of the 21st century to include more and more manufactured products (beginning most notably with clothing).

3.5 How Do Consumer Advocates Provide Product Endorsements and Ratings to Help Ellen Choose?

Actually Ellen rarely uses either the endorsement or ratings functionalities of her hand-held shopping support tool. While she did once view a tutorial on how the system works, she never got to be really good at using it. Her Facebook friend Rajesh, however, frequently reviews products and the organizations that produce them through the system. As Ellen knows Rajesh and values his opinion, if she sees he has rated a product or endorsed someone else’s review, she will pay more attention to that information. The same goes for the other contacts in social networks that Ellen participates in.

As an environmental activist, Rajesh knows that the trickiest part of the system turns out to be in unraveling the certification and endorsement information. There exists a complex array of certifications with a variety of norms and standards, which make it hard for consumers to understand the true meaning of each seal. Moreover, because consumers have become increasingly willing to pay for products produced, shipped, and sold in a value-conscious way, immense economic incentives drive corporations to always want to appear to be value-conscious. “Green-washing” became an implicit goal of many marketing campaigns and a well-understood technique that was actually taught in classes in business schools.

Fig. 3: Consumer Advocates Provide Product Ratings



Ellen, like most value-conscious users, had become wary of making use of the first available information that her shopping support tool produced because of these “green-washing” effects. Therefore, she started to rely on product evaluations that came from several consumer advocate groups that she had come to know and trust (dashed pink line in Figure 3). These consumer advocate groups made their own product ratings available through social networking sites that they could carefully control. They made it their business to carefully comb through all of the information made available on the I-Choose system, checking and re-checking information sources carefully. Therefore, their rating results can be drilled down to the details of the information elements on which the rating is based. A “thumbs up” or “thumbs down” endorsement by one of these larger consumer advocate groups could easily make several percentage points difference in market share, so many corporations became adept at paying attention to these groups. Rajesh likes this aspect of the system and wants to participate further. Together with a group of his online friends, he decides to submit some comments to the organic working group for them to include in the next product standard review.

3.6 How Do Certification Relationships Work in I-Choose?

A key technical problem that needed to be solved before I-Choose could become an operational system was how to represent trusted certification and endorsement information on the system. The initial efforts to define the I-Choose standards made evident the need to clearly define differences in the meaning of different seals and logos used in product packaging and marketing, as well as the norms and standards followed by each of them. Consumers needed to know the difference between a voluntary regime such as the Mexican Corporate Social Responsibility Seal (which is mainly based on a self-assessment and the goodwill commitment of the company), organizational certifications involving a third-party inspection such as the World Fair Trade Organization, or product certification such as USDA Organic.

Moreover, specific meanings of each certification needed to be more transparent. In this way, as early as 2011, all certifying authorities, either national governments or international organizations, made their standards and criteria public, and started to get agreements about meanings of each of them. In fact, the process showed important intersections among certifications, making it attractive for certifiers to get an agreement on meanings and definitions to share information not only with consumers, but also among certifiers themselves. By 2015, the I-Choose standard incorporated a completely agreed-upon set of organic, safety, social and environmental norms and criteria.

The shared set of norms not only makes the meaning of each certificate clearer and more transparent to consumers like Ellen, but also helps certifying authorities to build trust in each certificate, in turn making certification processes cheaper to the producers and other supply chain actors.

Fig. 4: Certification and Endorsement Relationships in the I-Choose System

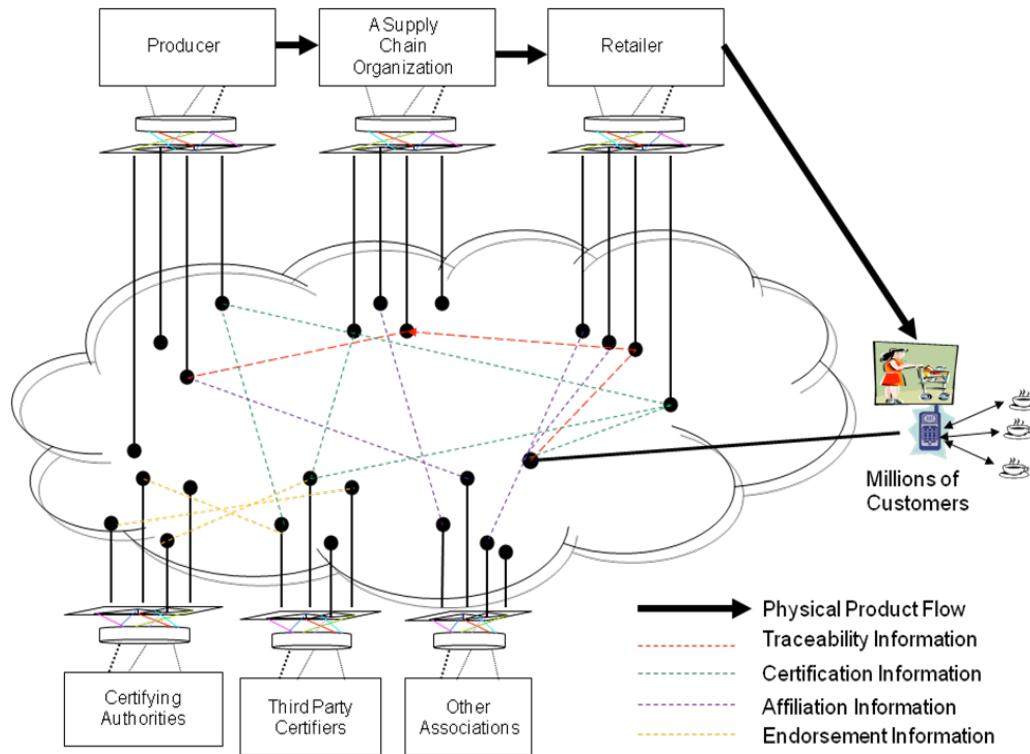


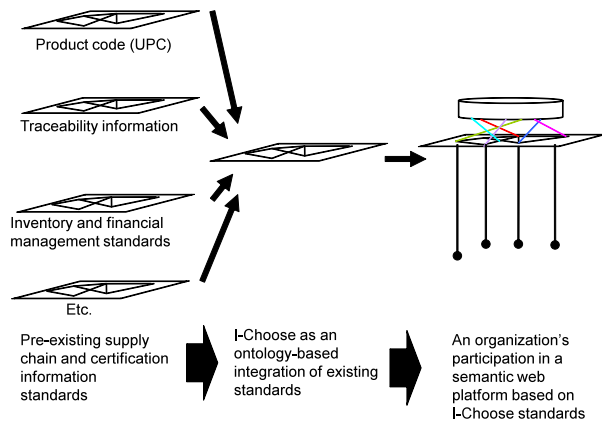
Figure 4 illustrates in more detail how these types of certification and endorsing relationships are handled by the I-Choose system. First, the system clearly differentiates certifications from other affiliations or associations. That is to say, consumers can know when a product or organization has passed a formal independent certification process, and when an organization has internal self-assessment mechanisms to show its commitment with some specific values related to a particular association (like Catholic Relief Services, Mexican Center for Philanthropy, or the Roundtable on Sustainable Palm Oil). All formal certification processes are endorsed by digital certificates that use current security technologies and can be authenticated and trusted.

3.7 What is the Relationship between I-Choose Information Standards and Other Information Standards?

Figure 5 answers a final question about the I-Choose system as an overarching set of information standards for all kinds of products being delivered to retail markets: What are the relationships between the I-Choose information standards and other sets of information standards such as the ubiquitous UPCs?

By the end of the first decade of the 21st century, the logistics and supply chain industries were converging on a set of product identification, shipping, inventory, and financial statement standards for use in all aspects of the supply chain. Such systems could support traceability, connecting projected customer demand at various retail locations to production orders at sites in remote sections of the globe.

Fig. 5: I-Choose is an Ontology-Based Integration that Relies on Pre-Existing Information Standards and Enables Organizations to Share Data with XML



As illustrated in Figure 5, a key component of the earliest I-Choose systems was that they relied on an integrated ontology to explicitly map out the relationships between these various pre-existing information standards. The earliest I-Choose ontologies conformed to international standards (such as the OWL standards) for generating XML schemas. What was not very developed was the integration of certification and endorsement information standards alongside the more developed product identification, supply chain logistics, and financial management standards. These standards were critical in order for customers such as Ellen to start to trust the information being provided through her handheld device and for consumer advocates, serving as information aggregators, to participate in the system.

4. Governing FIPP Regimes

According to our focus group of I-Choose Network participants, this future possible world is not so far away. But it will not spring to life without building partnerships between consumers, producers, retailers, advocacy groups, and government regulators. And in order to build trust between these partners, there are real, concrete information asymmetry problems which must be overcome.

Not only do these partnerships have to accommodate varying interests and values, but they have to cross borders. This is where technology can make a real difference. Traditional bureaucratic and diplomatic structures in cross-border settings can be slow and cumbersome, taking years to formulate compatible lists of goods and services. It took approximately Not only that, but they are expensive. Perhaps we look to a future with increased use of market forces to support (supplant) weaker regulatory approaches, where governments “regulate” the information in the market, rather than content of products and services, leaving compliance to the market. It

is apparent that this discussion has implications which expand beyond consumer markets and might indeed move toward a discussion of government regulation in other areas including, perhaps, securities and trade.

This discussion leads to a key question: What role, if any, should government agencies and regulators play in requiring and regulating the collection of FIPP information? This section explains the tradeoffs associated with governing a potential I-Choose system, and discusses how they might be overcome.

4.1 Existing Trade Governance and Non-Price Information

In the modern context, it is inaccurate to speak of a single form of governance for international trade. A hierarchical global system—created by states, consisting of binding legal rules, and headed by a formal international institution, the World Trade Organization (WTO)—exists alongside a growing number of market and network-based regulatory and certification systems covering many products and services. There is a rapidly growing literature on these systems, which include standards produced by the International Organization for Standardization (ISO), products produced by transnational private sector regulators such as financial product rating agencies, industry-wide accreditation bodies, international commercial tribunals, and non-governmental product certification schemes (Auld et al. 2010, Büthe 2010, Prakash & Guerty 2010, Bartley, 2003, and on voluntary programs Coglianese & Nash 2001, Darnall, Potoski & Prakash 2010).

In terms of how they handle non-price information, there is an important distinction between state and non-state regulatory systems. The state-led system intentionally separates economic issues from the social and environmental consequences of trade, with the aim of identifying and eliminating trade barriers (Jarman 2009). The very purpose of non-state systems, however, is often to combine price and non-price information in order to increase the desirability, and the value, of the goods being traded (on coffee, for example, see Fridell 2007, Jaffee 2007). At the moment, these two types of systems are not particularly compatible. As FIPP usage grows, however, it may become increasingly difficult, or less desirable, to separate price and non-price information, challenging the existing state-led trading system, and presenting governments with a range of new regulatory choices.

The state-led system regulates global trade at the macro level via a set of legally-binding rules. Multilateral, regional, and bilateral negotiations between states produce trade agreements which are enforced by dispute settlement mechanisms in the WTO and some regional trade agreements. The resulting multilateral rules say comparatively little about the social, human rights, public health, or environmental aspects of trade, while bilateral and regional agreements, where they do address these issues, incorporate them as narrow sets of standards which are often divorced from realities on the ground. International Labor Organization (ILO) standards such as prohibitions on forced or child labor, and commitments to uphold multilateral environmental or human rights agreements are sometimes incorporated into the text of trade agreements, or included as side agreements to the main text (see Destler & Balint, 1999, Elliott 2003, Greenhill, Prakash, and Mosely 2009). Many states also unilaterally adopt formal trade preferences (General Systems of Preferences, GSPs) which allow governments to restrict trade from states that they claim violate key non-price principles, and promote trade from states who uphold them.

Outside of these low-level, commonly-agreed-upon standards, the state-led system finds it difficult to distinguish between legitimate domestic regulations which protect workers, public health or the environment and barriers to trade. In fact, trends in WTO dispute rulings suggest that over time the state-led system is moving away from a non-discrimination approach, where

states agree not to discriminate against foreign producers and to treat trading partners equally, toward the elimination of more broadly defined trade barriers (Trachtman 2003, Vranes 2009). This makes conflicts over domestic regulatory standards increasingly more likely.

For governments, the alternative to an increasingly conflicted state-led trading system might ultimately be to play a greater role in forming or influencing non-state regulatory and certification systems. Perhaps, as we have seen with organic products, governments will attempt to harmonize standards between emerging FIPP systems. In this sense, FIPP information could, in turn, provide an evidence base for the formulation of new product standards and regulations.

Governments already have well-established standards for public and interest group consultation on trade, public health, and environmental issues—requirements to publish their actions and hold public meetings, as well as established advisory group systems which bring select stakeholders into regular contact with officials. Some of these public meetings, such as recent meetings to discuss the FSMA, already make extensive use of online tools.

But great potential exists for governments to do more to bring consumers into the negotiating process- to make them part of the decisionmaking structure, not just an adjunct to it. For trade in goods, this means building a system that encourages broad consumer participation in formulating expectations for how corporations should act, incentives to support compliance with those expectations, and encouraging innovation among producers, suppliers, and entrepreneurs.

We now turn to examine the most important tradeoffs that will be faced by any such system. There are three key dilemmas that regulators must take into consideration. First, we point out that governments and regulators must understand the commercial context surrounding FIPP systems, balancing cost considerations with information requirements. Second, we discuss the key tradeoff between protecting private information and ensuring broad access to the system. Finally, we imagine how such considerations might be balanced within a governance framework. These discussions draw heavily on input from our I-Choose Network focus group.

4.2 Balancing Cost and Sustainability

The key question facing commercial actors engaging in the creation and provision of FIPP systems is what is the necessary and desirable level of information that can be provided at a reasonable cost?

Producers and retailers are interested in participating in FIPP systems because of their potential to differentiate their products within crowded markets. Providing trusted information about the origins of a product to consumers can enhance a company's sustainable credentials against its competitors. But there are many questions about where the cost of such systems will fall within the supply chain. Will costs of product traceability fall on the producer, or the consumer—directly through prices or indirectly via taxation? Where should these costs fall to establish and maintain a successful FIPP system?

Our functional and usage explorations above indicate that some common standards are necessary: harmonization of certain product information is required for the system to work. But establishing these standards may not be as onerous as it looks. The 2011 Food Safety Modernization Act already requires the FDA to establish “a product tracing system to receive information that improves the capacity to effectively and rapidly track and trace food that is in the United States or offered for import into the United States.” The European Union's Basic Food Law of 2002 requires information such as the names and addresses of suppliers, product descriptions, and delivery dates. In Germany, cattle receive a “passport” with this information,

while in Belgium, meat is labeled with bar codes containing the required data. It is not such a stretch to imagine that producers and suppliers might want to build on these skeleton information frameworks, providing additional data on production and shipping in the same formats, in exchange for the commercial advantages of accessing large communities of interested consumers. If a system such as our future-possible I-Choose is trusted by all parties, the commercial benefits to companies in participating, rather than going it alone, may be significant.

Agreeing on the necessary data standards need not involve imposition. Handling this problem requires delicate negotiation and collaboration within a framework that engenders trust between organizations, as well as between consumers. Any governance system which aims to promote FIPP will need to bear this commercial context in mind. Overzealous regulation may turn off producers and retailers if the price is not right. At the same time, government funding constraints critically shape regulatory capacity and direction. A key example is recent legislation⁴ directing the FDA to improve product traceability, with the particular goal of improving food and drug safety. The FDA may not currently have the capacity or resources to make this mandate work. A danger exists that such systems will be seen as purely or mostly revenue raising mechanisms, charging large registration fees for entry, with little real oversight exercised. For this reason, focus group participants stressed the need for broad participation in, and ownership of, any governance structure.

4.3 Balancing Privacy and Access to Information

The second dilemma is how to balance individual and commercial privacy with appropriate and broadly applicable open access to information. On the one hand, the promise of FIPP lies in the ability of such systems to provide, in theory, open and seamless access to a wide range of data. As the discussion of our “I-Choose” ideal type shows, Ellen is reliant upon broad participation from other consumers, companies and NGOs in her decision-making process. Technological social media integration must be balanced by broad participation from individual consumers and NGOs if the system is to be successful.

Our focus group emphasized this participation as key to the success of an I-Choose project. SMEs, small developers, and other groups may lack expertise and need support to participate in the scheme, while producers and suppliers with fewer resources may have little access to the Internet or technology. Current use of information systems and technologies varies in an important way not only across FIPP networks, but also among members of the network. For instance, the *Tosepan Titataniske* traceability system of organic and fair trade coffee is a very carefully designed paper-based system, while retailers like Walmart are heavily investing in advanced hardware and sophisticated information systems. Any governance mechanism would need to incentivize producers and suppliers with fewer resources to act collectively in order to overcome these difficulties. One important suggestion was that any governance system should incorporate the promotion and facilitation of collective agreements between organizations with different levels of resources who are participating in the same FIPP system which set out clear and equal relationships between the parties.

One further barrier to access is the ability of consumers to access information in their own language. Any governance system should consider the need to promote crowd-sourced

⁴ FDA Food Safety Modernization Act. 2011. H.R. 2751. <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:H.R.2751>

translation of various data. There are also important legal requirements in some cases. In Canada, for example, there are legal requirements to translate official information into both French and English. Translation may impose additional cost burdens in jurisdictions with multiple language requirements.

But it is not just necessary to provide open access to information. The I-Choose system is also about trust in that information and the organizations that provide it. To support that goal, there are some participants that we would want to deter. In order for them to trust the system, consumers should have the right to expect that important personal information will be kept private in such open systems. The explosion in recent years of the number of organizations using the Internet to make money illegitimately will affect online FIPP systems as well. Consumers should have the right to be protected from organizations that want to use such systems for direct marketing and scams.

4.4 Imagining a FIPP Governance System

Hence, the aim of any FIPP governance system should be to create a policy environment which can support, sustain, and aggregate innovative sustainability initiatives and build trusted relationships between participants. At the heart of this system must be a balance between mechanisms which enable ‘hard’ regulation, partnership building, and wider participation. Let us speculate for a moment about some potential ways to balance these requirements.

One way to do this might be to establish a North American Traceability Council (NATC), with representation from stakeholders. Its members should include—at the least—government representation, sustainability and green supply chain experts, industry associations and consumer organizations, with mandatory representation from or on behalf of producers and consumers with fewer resources. The NATC should be as ‘virtual’ as possible to minimize costs to participants. The Council would work together to set the binding minimum information standards that will allow the system to function, based on existing information standards for traceability in the three countries.

The NATC could then oversee the negotiation and implementation of a “virtual ISO” which is not just negotiated in private by interested parties, but is regularly reviewed by NATC and ‘consumer champions’, active consumers who participate regularly in reviewing products and organizations. The ISO would become a living set of process management standards for providing, handling, and using product data. They would be regularly updated with input from stakeholders, consumers, and regulators. Companies, NGOs, or government bodies could be certified under this ISO if they consistently meet the requirements for peer and consumer review. Evidence from scholars of global policy suggests that ISO standards, such as ISO 9000, are popular with companies as means to differentiate themselves in the marketplace, and seen as both flexible and fairly objective.

Within the framework of the virtual ISO, companies could nominate key substantive parameters and set benchmarks against them. Participating companies would be free to use the aggregate information in their product marketing, creating their own labels and so on, but under advisement from the NATC and guidelines established through the ISO. Results of peer review would become incorporated into future versions of the ISO. This is not a pipe dream- elements of this system are currently being implemented in several other countries. France, for example, is carrying out a traceability experiment involving sustainable benchmarking by 160 companies (Barroux 2011). The European Commission is watching this experiment carefully in order to inform its own policy choices.

This peer review process would be matched by consumer review. Information from participating consumers acting in social networks –such as product and company reviews, or

location information enabling better supply chain mapping- could contribute to the evidence base for future versions of the ISO and for benchmarking exercises. Consumers could opt to comment on and review products, producers, and other suppliers. They would benefit by seeing what others have recommended and use this to assist their purchasing choices. Companies, on the other hand, would gain the opportunity to “test” the sustainability of their products among participating consumers and create better connections. NGOs could submit information into the system about certification, inspection and production practices. Reviews and reports would be verified and ranked by other participants. Consumers who submitted highly ranked product reviews consistently would become “consumer champions.” Results from consumer comments could be aggregated and accessed by all participants. Significant consumer concerns would be addressed through the peer review process.

In the long run, these governance structures should promote North American partnership agreements between organizations which lay out what the expectations are for participants. The aim here would be to promote model agreements to participating certifiers, supply chain operators, producers, and other participating groups, that draw on innovative experiments in intellectual property law and practice. While it may or may not be desirable to require such agreements, participants in the NATC process could at least become model organizations, putting pressure on each other to address these ownership issues, and sharing best practice. Given the current enormous resource cost to companies of acquiring and defending patents, any FIPP governance structure should embrace the potential inherent in these experiments.

7. Conclusions

In this paper we have explored the potential for rapidly developing technological and social trends to affect markets, support consumers, and promote sustainable growth in North America, outlined a future-possible I-Choose system which highlights the essential tradeoffs in designing such a system, and explored several suggestions for governing such a system to promote broad participation and trusted relationships.

These suggestions are preliminary, representing only the possibilities of such a governance system. They are, and should be at first, idealistic. Nevertheless, we believe that they are important- discussions about product traceability, safety, and sustainability can be greatly enhanced by taking current and future technological developments into account. Governments in North America, Europe and Asia are currently having these conversations. Over the duration of this project, we will be testing and evaluating these and other policy solutions via the I-Choose network, as our contribution to these debates.

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