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An ethnography of Electronic Shelf Labels: The resisted digitalization of prices in contemporary supermarkets

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ABSTRACT

Contemporary retail markets have experienced and are experiencing an important digitalization shift in the form of computers and associated technologies. Among a large array of digital innovations, Electronic Shelf Labels (ESLs) deserve particular attention. ESLs, despite their long history and many benefits, have not become ubiquitous. The purpose of this paper is to account for this “resisted evolution” of digitalized prices. It draws theoretically upon science and technology studies, infrastructure studies, market studies, and previous literature on price representations in retailing. It draws empirically on a combination of ethnographic and historical methods. The paper shows that ESLs do not replace paper prices, but, rather, work together with them: on one hand, they compete to represent prices with their respective features, and on the other, they co-operate in order to reinforce the visibility and attractiveness of products and promotions.

1. Introduction

Contemporary retail markets have experienced and are experiencing an important digitalization shift in the form of computers and associated technologies (Hagberg et al., 2016). Important contributions to this development have included the introduction of the Universal Product Code (UPC) in the 1970s (Cochoy et al., 2016a) and the subsequent spread of checkout scanners, Point Of Sale (POS) software, computerized couponing and loyalty programs, biometric payments, RFID chips, e-catalogs, e-commerce, and, more recently, QR codes, smartphone apps, and other interactive technologies. Among this large array of innovations, Electronic Shelf Labels (ESLs) deserve particular attention. These devices present themselves as electronic price tags: they allow retailers to change prices through computerized transmitters instead of tedious handheld operations, and they offer consumers a clear and accurate form of price display. As such, these devices evidence a puzzling situation. On one hand, they pertain to one of the most classic and crucial features of self-service retailing: the display of prices; thus, it would seem that they should play a distinct and prominent role in retail digitalization. On the other hand, despite their relevance and decades-long history, ESLs have not become ubiquitous. Even in those few retail outlets where they have been implemented, ESLs seem to face resistance from paper price tags and price cards. The purpose of this paper is to account for this “resisting evolution” of digitalized prices and to discuss the role of price display technologies in the functioning

of contemporary economy.

Retailing has been subject to a great number of pricing innovations that have received considerable attention (see e.g. Grewal et al., 2010, 2011; Kopalle et al., 2009). The literature has explored the effects of low price guarantees (Biswas et al., 2006), dynamic pricing models (Hall et al., 2010), and mobile payments on consumers’ price images of retail stores (Falk et al., 2016), among others. However, while prior studies have examined different retail price innovations, they have so far tended to neglect the more material aspects of pricing innovations: that is, the particular devices involved in price representation. Further, there has so far been a paucity of studies addressing how digital forms of pricing interrelate with their more analogue counterparts. Moreover, so far, existing studies have paid insufficient attention to the process of innovation, including how and why particular digital technologies face resistance.

Theoretically, we draw upon infrastructure studies (Bowker et al., 2010) and market studies (Callon, 1998), two fields of research inspired by science and technology and the Actor-Network Theory (ANT). More specifically, we rely on the previous literature focused on price representation practices in retailing (e.g. Grandclément, 2008; Hagberg and Kjellberg, 2015). These works portray markets not as abstract platforms connecting supply and demand, but as complex “agencements” (Callon et al., 2007; Callon, 2016) or arrangements of human actors, organizational schemes, and material artifacts that shape and perform the economic game. Within such configurations, “price

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representations,” price infrastructures, and price display techniques—rather than abstract and automatic “price adjustment” mechanisms—play major roles.

Empirically, this paper draws on several different sources. First, it builds a longitudinal “archaeology of price tags” based on a systematic reading of the trade journal *The Progressive Grocer* from 1922 to the present. Second, it references an ethnographic study of three stores equipped with ESLs from one specific provider, including observations within these stores documented through field notes, photos, and interviews with retail managers and ESL professionals, as well as observations of the websites of ESL providers. Third, it is based on a short ethnography of paper price tags in New York City performed in 2016. The paper shows how ESLs prolong but also challenge nearly a century of price display technologies by improving the chain of “price representations” (Hagberg and Kjellberg, 2015) by adding new possibilities in terms of price flexibility. Further, it explores how the claims of ESL providers and the promises of their technologies should be questioned as soon as these claims and devices are put into practice, particularly when ESL faces competition from classic paper price display techniques.

The paper is structured as follows. In the next section, we introduce our theoretical framework. This is followed by a section describing our method. Thereafter, our findings are presented in four sections. The first of these sections traces the history of price tags and the role of ESLs within this history, then discusses ESL providers and how and why the stores under study have been equipped with ESLs. In the second section, we further explore ESLs by entering stores and by presenting the three variants of price representation observed during our visual ethnography. The third section analyses the interaction between paper and electronic tags that represents prices in food retail markets. In the fourth section, we further elaborate on these findings by putting contemporary ESLs into perspective. Finally, we conclude with some reflective remarks.

2. Theoretical framework

Theoretically, this paper draws on previous work on science and technology studies on markets and innovation and price representations in retail settings, presented below in two sections.

2.1. Infrastructures, innovations, and markets

First, the paper draws upon studies of infrastructure (e.g. Bowker et al., 2010) and markets (e.g. Callon, 1998), two fields of research inspired by science and technology studies and Actor-Network Theory (ANT).

Science and technology studies have long explored the complex interactions between human beings and material artifacts. The so-called Social Construction Of Technology (SCOT) model suggests that technologies are neither neutral nor detached from social and political stakes. ANT proposes a more symmetrical approach in which human and non-human entities combine their properties to shape social action, without any of them a priori superseding the other (Callon, 1986). Both approaches have traditionally focused primarily on the engineers and entrepreneurs who design and implement technologies (Akrich et al., 1988; Bijker and Law, 1992; Latour, 1992). More recently however, greater attention has been paid to users, both as co-innovators (Oudshoorn and Pinch, 2003; Von Hippel, 2005) and as the targets of technological efforts (Hyysalo et al., 2016). Within this perspective, we will examine price display techniques that will help us pay close attention to not only the views of ESL providers, but also the perspectives of their clients and ESL technology itself.

Infrastructure studies insist on “collective equipment necessary to human activities,” such as road and computer networks, defined as “a broad category referring to pervasive enabling resources in network form” (Bowker et al., 2010). Considering price display equipment as

infrastructures illustrates that prices are neither abstract entities nor isolated numerals, as economics tends to represent them, but are instead interconnected entities whose technological design frames consumers’ cognition and behavior.

This view supports the agenda of market studies, a body of work that proposes to study markets as the performative enactments of economic and managerial theories (e.g. price models or pricing strategies) (Callon, 1998) through the use of ad hoc “calculative devices” (Callon and Muniesa, 2005). Fabian Muniesa and his colleagues further refined this view by proposing that markets should be considered as specific forms of “agencements” (Muniesa et al., 2007), a French synonym for “arrangements.” By alluding to both “agent” and “agency,” this notion emphasizes the distribution of action between human agents and technical artifacts. Price display systems, as human-driven tools that nevertheless have their own agency (e.g. their own capacity to act), clearly fall within this category.

All of these works support the perspective of markets not as abstract platforms connecting supply and demand, but as complex “infrastructures” and “agencements” comprising human actors, organizational schemes, and material artifacts. These infrastructures and agencements shape and perform the economic game. Within such configurations, the major role is played not by abstract and automatic “price adjustment” mechanisms, but by price display techniques.

2.2. Price representations

We also draw upon previous contributions relating prices and price representation practices in retailing. Traditionally, prices have been considered by mainstream economics to be neutral outcomes of exchanges, theorized under the familiar law of supply and demand. From a marketing perspective, however, prices have instead been conceived as a tool within the marketing mix used by marketers to position products in the market (Borden, 1964). Within marketing, extensive attention has been paid to retail pricing, including the use of different pricing strategies, practices, and techniques and consumer perceptions of retail prices (e.g., Ahmetoglu et al., 2014; Biswas et al., 2006; Falk et al., 2016; Grewal et al., 2010, 2011; Hall et al., 2010; Kopalle et al., 2009; Lombart et al., 2016). However, despite this extensive body of literature, there is a relative paucity of studies addressing the actual work of representing both prices and the material aspects of price representations (Hagberg and Kjellberg, 2015). This brings us closer to the notion of “practices” (Shove et al., 2012) and back to the concept of “market agencement” (Callon, 2016).

According to Shove et al. (2012), practices are combinations of materials, competence, and meaning. According to this perspective, there is no such thing as autonomous people making decisions within a given external context; rather, the social world is made of practices formed through webs of infrastructures, artifacts, culture, norms, skills, and actions (Shove, 2010). Prices are both the expressions of “practices” and the production of particular “market agencements.” As practices, prices are not reducible to managerial action, but are instead the expression of the multidimensional practice of price fixing. As aspects of market agencement, prices are not the neutral outcome of the interaction between the supposedly independent blocks of “supply” and “demand,” but represent, rather, the production of a hybrid network of objects and actions designed to value and qualify goods (Callon and Muniesa, 2005).

Grandclément (2008) showed that prices are ubiquitous in retail stores by studying the concrete actions of the retailers who handle prices in what she called a “jungle of paper.” She drew attention to the fact that prices are primarily material entities, requiring paper, cardboard, plastic, etc. They also tend to involve visual, material, and discursive elements and to take multiple forms. This ubiquity and plurality led Grandclément (2008) to notice that many of the prices displayed in stores do not reflect what customers actually pay (e.g. special prices may be offered for “virtual bundles,” but many consumers still buy single goods). Hence, she distinguished between “prices of calculation” and “paid prices.” Secondly, she claimed that

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