

**Autonomous Stores:  
Sociotechnical Infrastructures, Imaginaries and  
Data Governance**

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**Research Brief**

**Media Coverage of Autonomous Stores: What futures are being created and disseminated?**

September 2024

**Introduction to the project**

The core goal of this project is to examine how autonomous stores are discursively and materially constituted, maintained and used. In other words, we seek to examine the worlding practices (Haraway 2016) of these infrastructures to ask what worlds they produce, transform, and reify, and with what implications. To do we draw upon two complementary research questions:

- (1) Identify and examine the sociotechnical imaginaries that drive and justify the development and regulation of these places;
- (2) Examine the practices and infrastructures through which autonomous stores are implemented, maintained and used, and the underlying concepts of autonomy and agency.

**Research team**

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**Research brief goal**

This research brief focuses on the first research question/task, that is, it focuses on the sociotechnical imaginaries of autonomous stores. Because these entities are new and unstable, the media have a large role in stabilizing them. We therefore focus on the sociotechnical imaginaries of AS circulating in the media.

### **Why sociotechnical imaginaries?**

Defined by Jasanoff (2015: 4) as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology”, sociotechnical imaginaries highlight the performative role of discourse and imagination in bringing entities and worlds into existence (see also Jasanoff & Kim 2009). Sociotechnical imaginaries are described by Sismondo (2020: 505) as infrastructures of imagining and planning, that is, they highlight the entanglements of social life with technological innovation and put in evidence the many ways in which thinking and writing about the future is actually a form of future-building.

### **Why the media?**

There are numerous reasons why we decided to focus on the media. First, autonomous stores are still unstable entities – there aren’t that many around, stakeholders are still unclear on what they are and what they will be – and thus the media, where they are “frequently” cited are key venues where these entities are stabilized, normalized and domesticated.

Moreover, the media are key in framing issues for both the public and decision-makers. Due to their reach, they are often venues where imaginaries circulate and reach global readerships.

Finally, the media often appropriate and translate narratives from other actors with their own agendas and are thus good research sites and objects of study, that is, places where we can examine the agendas of several stakeholders in the worlds of autonomous stores. Some studies have shown, for instance, that this allows tech companies to increasingly shape visions of the future and social norms (Mager & Katzenbach 2021)

### **Research questions:**

1. What visions, problems, and fantasies about autonomous stores circulate in the media?
2. What strategies drive, justify, and normalize the materialization of these imaginaries?

### **Methodology**

The first step towards conducting this analysis was identifying the main national and international actors engaged in the production of autonomous stores. These can be found here:

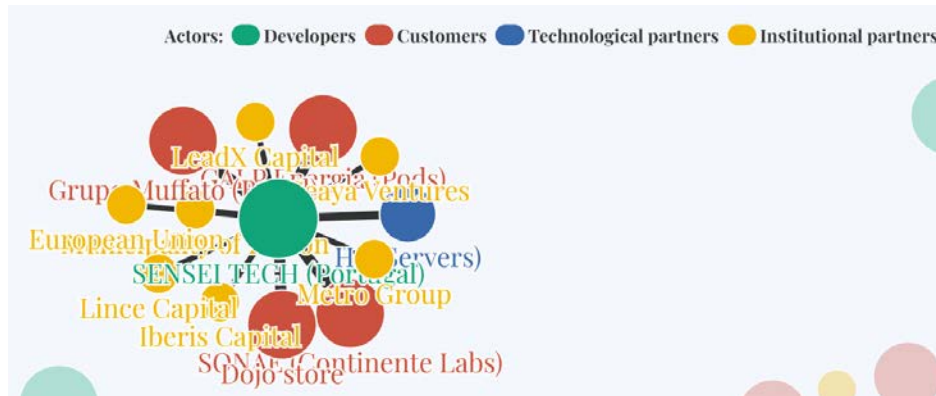


Fig. 1: Partial view of the actor map, focusing on the main national (Portuguese) actors. Extracted from: [https://autonomoustores.fcsh.unl.pt/?page\\_id=228](https://autonomoustores.fcsh.unl.pt/?page_id=228) (October 11, 2024)



Fig. 2: Partial view of the actor-map, focusing on the main international actors. Extracted from: [https://autonomoustores.fcsh.unl.pt/?page\\_id=228](https://autonomoustores.fcsh.unl.pt/?page_id=228) (October 11, 2024)

Having acquired insight into the main actors, we then generated data from several sources in Portugal, the United States and the United Kingdom. We focused on the period from 2016 (when Amazon first announced its ‘Amazon Go’ store thus heralding the birth of autonomous stores) and 2023 (when the research was conducted). The venues and rationales for their choice are detailed below:

- a. Portugal: We used an automatic tool to ‘find’ articles published in both generalist, mainstream newspapers and specialized outlets. This search was then complemented with a manual search using google.

- b. Global readerships: In order to examine how narratives are being globally built, we examined three venues that publish in English and have international readerships - The Guardian (UK, generalist newspaper), The New York Times (USA, generalist newspaper), Wired Magazine (USA, technology specialized magazine). Articles were searched manually in the different site of each publication.

We then used thematic analysis (Braun & Clarke 2004) to identify the main themes and codes emerging across these distinct contexts. We used MaxQDA for this step of the analysis.

Media outlets	Number of articles (percentage)
Portuguese mainstream and specialized outlets	59 (43)
The Guardian (generalist, UK)	32 (23.3)
New York Times (generalist, USA)	28 (20.4)
Wired Magazine (specialized, USA)	18 (13.1) including two sponsored articles
<b>Total</b>	<b>137 (100)</b>

Fig. 3: Number of articles extracted/identified in the different sources

## Findings

### 1. Definition of AS

How are autonomous stores defined in the media?

<p>“our mission is to create smart stores that intuitively understand customers' needs and help retailers provide them with a more convenient, frictionless and personalized experience and service than has been possible to date”. (PT specialized venue 2018, news article)</p>	<p>Materialization of the ideals of convenience and personalization, which are aligned with the vision of the consumer as the neoliberal (autonomous) individual</p>
<p>“Our checkout-free shopping experience is made possible by the same types of technologies used in self-driving cars: computer vision, sensor fusion, and deep learning” (The Guardian 2016, news article)</p>	<p>Futuristic narrative, highlighting the technologies that are part of a cutting-edge technological infrastructure, such that: Tech innovations = Progress</p>

"the services offered by [Portugal's] new startup star promises to revolutionize the way we shop"  
(PT specialized venue 2021, news article)

## 2. Conjuring users

As they create the entity of the 'autonomous stores', the media conjure their users and the needs of said users.

"[It] is a really interesting retail concept which fits a busy consumer lifestyle, particularly in the convenience store space. In this space people use words like "frictionless" and "painless" shopping." (The Guardian 2017, news article)

"These stores are positioned at millennial parents who are busy, they want to be in and out, they don't want to waste their time [...]. And younger people, generation Z, just don't want to interact with store staff." (The Guardian 2021, news article)

"Other benefits will come in the form of more marketing data, more targeted deals and a faster and more satisfying experience for customers – particularly urban customers – who want their stuff quick and convenient." (The Guardian 2018, news article)

"The store is only open to shoppers who can download an app on their smartphone, which rules out those who rely on welfare food stamps" (The Guardian 2018, opinion piece)

Users are envisioned as being:

- Busy
- Young
- Urban

Searching for:

- Convenience
- Frictionless or painless shopping

To the exclusion of:

- Elderly
- People who rely on welfare

(though these issues are only brought up in opinion and editorial pieces)

## 3. Needs

What (and whose) needs are driving the development of autonomous stores? In our queries, we found that the media tend to agglomerate and confuse two kinds of users: retailers and consumers. These have distinct motivations and goals but the media tend to subsume them thus eluding their differences and power differentials.

Qui bono?	Customer	Retailer
<p>“Amazon is keen to emphasize the customer benefits: nobody likes waiting in line to pay for groceries, or fumbling with one’s wallet at the register. But the same technology that automates away the checkout line will enable Amazon to track every move a customer makes.” (The Guardian 2017, news article)</p>	<p>Increasing convenience by removing “time consuming” checkout sites (deemed to be sources of friction)</p>	<p>Tracking customers’ every move</p>
<p>“For Vasco Portugal [Sensei’s CEO], [...] making the shopping experience as simple as going to the pantry or fridge” is an expectation in line with a new generation, used to ordering an Uber and paying via an app. ‘I truly believe we are giving retailers the capacity to eliminate something that does not make sense: lines’” (PT specialized media 2023, news article)</p>	<p>Producing a better shopping experience for consumers</p>	<p>Generating more data for retailers</p>
<p>“Sensei was created based on three pillars of inefficiency in retail: queues, the lack of information between the moment the customer picks up a product and pays for it, and the fact that the customer base, although huge, is mostly anonymous.” (PT generalist venue 2023, news article)</p>		<p>Removing sources of retail inefficiency: queues, customer invisibility in store, and customer anonymity</p>

#### 4. Discursive tropes and strategies

What tropes and figures are used as worlding (Haraway 2016) strategies? That is, what tropes and figures are mobilized about to normalize and domesticate autonomous stores?

	<b>Discursive tropes and figures</b>
<p>“Just Walk Out addresses consumers’ frustration with waiting in checkout lines, so they can quickly get their items and move on with the rest of their day. That’s the power of what machine learning can do to create <u>magical</u> experiences for consumers”. (Wired n.d., sponsored article; our emphasis)</p>	Magic
<p>“With this technology, Sensei enables physical retailers to manage their physical stores digitally. It is thus possible to provide these spaces with e-commerce features, such as a vast volume of data.” (PT specialized venue 2019, article)</p>	Phygital
<p>“Physical stores are an essential part of the consumer's shopping journey and, in the digital age, they must be enriched with personalized services thanks to new technologies linked to data analysis”</p>	The power (and importance) of data
<p>“Among the advantages of technology are the gains in human resources, the fact that there are no more stock-outs and the promise that there are no thefts in these stores.” (PT generalist venue 2023, news article)</p>	End of theft
<p>“If my grandmother has a smartphone to talk to her grandchildren or great-grandchildren, if she uses it for two or three applications, and if someone helps her through that configuration phase - we'll have people in the store to help her do that - I would argue that, after trying it once or twice, they will be the most loyal people.” (Two generalist PT venues 2021, news article)</p>	The grandmother

## 5. Implications

What implications of living with autonomous stores are envisioned and discussed in the media? And, by extension, what themes are not discussed in the media? The impacts of AS can be organized into two camps – the optimistic and pessimistic views. These two camps often take the same topics but put different spins on them.

	Optimistic	Pessimistic
<p>“In [the CEO’s] experience, in the stores where the system has been installed, there is a combination of [workers] more focused on the end customer, explaining how the system works, rather than mechanical work, “we are humanizing the work of the person in the store and not the other way around”” (PT generalist media 2023, news article)</p>	<p>AS will “humanize” work. Reorganization of staff.</p>	<p>AS will cause unemployment</p>
<p>“And, really, it is just the next logical development from the automated checkouts already in use in most supermarkets [...]. So by any measure, it’s hard to see how an operation like Amazon Go doesn’t ultimately mean fewer jobs” (The Guardian 2016, news article)</p> <p>“Physical stores are an inevitable part of the consumer's shopping journey and, in the digital age, they must be enriched with personalized services thanks to new technologies linked to data analysis” (PT specialized venue 2019, article)</p>	<p>It’s Amazon. It’s inevitable.</p>	<p>Will result in fewer jobs</p>
<p>“Now [Amazon] is trialling a queue-less, cashier-less grocery store. Sensors will track which items customers pick up and bill their account as they walk out. The benefit to those in a rush is obvious – but it means another lost opportunity for social contact, in the queue with fellow shoppers, with cashiers or the staff overseeing erratic self-checkouts.” (The Guardian 2016, editorial)</p>	<p>Convenience</p>	<p>Loss of social contact</p>



<p>“Constant surveillance means there’s now shoplifting, but it has a whiff of Big Brother about it” (The Guardian 2018, opinion piece)</p> <p>“Amazon is likely to face some resistance as it colonizes more of our lives. People may not love the idea of their supermarkets spying on them, or every square inch of their homes being fed to an algorithm. But one should never underestimate how rapidly norms can be readjusted when capital requires it.” (The Guardian 2017, news article)</p>	<p>No theft</p>	<p>Big Brother surveillance</p> <p>Resistance (is futile)</p>
<p>“Amazon isn’t abandoning online retail for brick-and-mortar. Rather, it’s planning to fuse the two. It’s going to digitize our daily lives in ways that make surge-pricing your groceries look primitive by comparison. It’s going to expand Silicon Valley’s surveillance-based business model into physical space and make money from monitoring everything we do.” (The Guardian 2017, news article)</p>	<p>Phygital: Bringing the power of the internet to brick-an-mortar retail. Increased personalization. Better consumer experience.</p>	<p>Added surveillance. Surveillance capitalism.</p>

## Conclusions

The analysis of the sociotechnical imaginaries being created and circulating in the media show us a few different things:

1. The power of Amazon and tech companies in shaping the future is problematic and lacks analysis by media outlets
2. The media’s overreliance on industry actors: be it in the form of citations, interviews, etc, journalists too often rely on tech and industry for explanations and there is too little critique of these statements. Moreover, the same statements are picked up by different outlets and republished without critical analysis.
3. Generalized confusion/conflation of users: the media treat retailers and consumers as having the same goals and needs. This is not necessarily the case and it needs to be clarified.

4. Missing from media reports are important issues, such as:
  - a. Questions regarding the gendered and racialized history of automation;
  - b. Questions regarding what happens after data is collected;
  - c. Questions regarding the current legal frameworks
  - d.

### Communication, Dissemination and Publications

This analysis was generated with and through several activities conducted by project members. Amongst these we cite in chronological order:

1. Invited Guest on Podcast: ‘Antídoto’, episode on ‘A Vertigem dos Dados’. Antena 1. June 28, 2023.
2. Invited Guest on TV show ‘Sociedade Civil’. Episode on “Novos Media” (New Media). RTP2, Portuguese public TV channel. Feb. 8, 2024.
3. Keynote speaker. XVII Jornadas CIAC – Minds and Machines: AI in Communication, Culture and Arts. Centro de Investigação em Artes e Comunicação, Universidade do Algarve, Faro, Portugal, March 1, 2024.
4. Viseu, A. (2024 March). Interviewed by Deonilde, L. & Ramos, F. As Tecnologias Têm de Ser Reguladas. *Deco Proteste*, No. 465: 54-58.  
<https://www.deco.proteste.pt/tecnologia/computadores/entrevista/ana-viseu-tecnologias-tem-ser-reguladas>
5. Invited Facilitator. Reading Group on ‘Digital Technology & Society’. Session 10 on Surveillance Infrastructures (Infraestruturas de vigilância). Organized by Jussara Rowland and Ana Delicado (ICS). April 12, 2024.
6. XV Congreso Español de Sociología. Pereira, J., Viseu, A., Vicente, P. N. & Delicado, A. (2024). Autonomous stores’ as a new paradigm for retail? Sociotechnical imaginaries and media representations. Seville, Spain, June 26-29, 2024.
7. 6<sup>th</sup> Conference of the European Sociological Association. Viseu, A., Delicado, A. & Pereira, J. P. (2024). *What Makes a Store Smart and Autonomous? A Media Analysis of Sociotechnical Imaginaries*. Porto, Portugal, Aug. 27-30, 2024.
8. 10<sup>th</sup> European Communication Conference (ECREA). Viseu, A., Pereira, J. P. & Delicado, A. (2024). *Smart (and autonomous) in the city: A media analysis of sociotechnical imaginaries*. Ljubljana, Slovenia. 24-27 Sept. 2024.

9. Viseu, A., Pereira, J. P. & Delicado, A. (*accepted*). Smartness as a new paradigm for retail? Sociotechnical imaginaries of autonomous stores in the media. In Orrù, P. & Lupano, E. (Eds), *Artificial intelligence and human perception: media discourse and public opinion*, FrancoAngeli.