On the Potency of Online User Representation: Insights from the Sharing Economy

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Abstract Online user representation (UR) is a cornerstone of platform-mediated interactions within the sharing economy. While the general usefulness of UR artifacts for facilitating online and offline interactions is widely acknowledged and understood, the underlying mechanisms and operating principles often require a more detailed analysis. In this chapter, we thus introduce a systematic framework grounded in signaling and social presence theory for analyzing UR artifacts for online platforms in general—and the sharing economy in particular. We apply our framework as a structural lens in a case study on user profiles on Airbnb, unveiling structural similarities and differences between the opposing market sides. We discuss our findings against the backdrop of emerging information systems research directions and suggest paths for future work on the sharing economy.

1 Introduction

An ever-increasing number of businesses in today's e-commerce landscape facilitate the renting, sharing, lending, and selling of resources. In this platform or sharing economy, platforms from A(irbnb) to Z(imride) connect providers (e.g., hosts, sellers) and consumers (e.g., guests, buyers) to co-create value. Importantly, even though many of these multisided markets facilitate interactions that take place in the physical world (e.g., accommodation or ride sharing), the initiation, trust-building, and booking processes are entirely mediated by platforms. To do so, platform companies make use of a variety of *user representation* (UR) artifacts to establish trust between users (Hesse et al. 2020a). In fact, platforms vary greatly with regard

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H. Gimpel et al. (eds.), *Market Engineering*,
https://doi.org/10.1007/978-3-030-66661-3_10

to how and what kind of value is created (e.g., social and/or economic; Dann et al. 2020). Since this also affects the respective need for trust and how users engage, it is not surprising that platforms also differ with regard to the array of the UR artifacts they employ. Consequently, research on the role, use, and effects of UR artifacts is also diverse in terms of domains, platforms, dependent variables, theory, methods, and publication outlets (Dann et al. 2019).

Notwithstanding the multifaceted platform landscape, we observe a range of commonalities and "best practices" in how platforms employ UR artifacts and how this, in turn, affects user perceptions and behavior. For instance, a great majority of platforms uses rating systems to keep track of their users' behavior and reputation. Star ratings and text reviews are commonly considered the "hardest" currency when it comes to substantiating one's credibility for online transactions (Teubner et al. 2017). These cues (1) are provided by others, (2) aggregate the experience of prior transaction partners, and (3) can only be issued by these partners (e.g., guests or passengers). In particular this seclusion makes such cues reliable (very much in contrast to "open" product review platforms, on which anyone can rate anything—be it products, hotels, restaurants, or medical doctors). While rating systems do not come without shortcomings and side effects (e.g., fake reviews, rating inflation; Filippas et al. 2017; Teubner and Glaser 2018), they have become a central pillar of many platforms' operations and—from the individual user perspective—an essential tool to present oneself, evaluate others, and successfully engage in online markets (Teubner et al. 2017). In view of the importance and prominence of rating systems, other—"softer"—UR artifacts are sometimes overlooked. More specifically, there exists a wide range of other important ways of engendering trust, including the provision of profile photos, self-descriptions, and platform-issued labels.

In this chapter, we propose a conceptual framework for the diverse landscape of UR artifacts and link their cause-and-effect relationships to theory (Sect. 2). We then survey empirical findings on the pathways captured in the framework (Sect. 3), present data from a case study on Airbnb hosts and guests (Sect. 4), discuss ongoing discourse and developments (Sect. 5), and provide concluding thoughts (Sect. 6).

2 Theoretical Background

2.1 Signaling and Social Presence Theory

The way UR artifacts engender trust can roughly be described by two, partially overlapping routes. First, UR artifacts can serve to *signal* a user's trustworthiness (Spence 1973). This acknowledges that, like many other markets, transactions on sharing platforms feature information asymmetry between providers and consumers. Through the signal, a user demonstrates a track record of trustworthy behavior. In most cases, it is the provider who sends the signal. In some cases, however, consumers also have to market themselves and demonstrate their trust-

worthiness in order to be given permission to book (Karlsson et al. 2017). Since self-references cannot work through this route ("talk is cheap"), the involvement of a third party is required. This is reflected in the omnipresence of numerical and textual rating and review systems. In most cases, platforms use *mutual* rating systems, through which providers and consumers evaluate each other once a transaction has been completed. Thereby, they build up a reputation over time, reflecting the cumulative and aggregated experiences of *prior* transaction partners, which serves as a leap of faith for *future* ones. Moreover, ratings are usually provided *simultaneously*, avoiding (or at least mitigating) the detrimental effects of collusion and fear of retaliation.

The second route is described by *social presence theory* (Cyr et al. 2009; Gefen and Straub 2003; Short et al. 1976). Since the entire pre-purchase phase is carried out online (platform-, online-, and screen-mediated), the evolutionary processes and channels through which people conventionally establish trust are not available (e.g., physical closeness, body language, subtle gestures and countenance, biological messengers). At the same time, however, trust is even more essential in this setup due to information asymmetry and low (perceived) accountability and accessibility in case of problems. To bridge this trust gap, platform operators attempt to convey social cues through the platform's web interface. The resulting *social presence* can be understood as "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships" (Short et al. 1976, p. 65), as enabled by the communication medium. As any pre-transactional communication is mediated through the platform, perceived social presence reflects how different UR artifacts convey a sense of the other person being psychologically present. It is through this social presence that UR artifacts engender trust—even without "proof." Prime examples of cues to achieve this are profile photos, self-descriptions, and the provision of other personal data.

2.2 Framework of User Representation Artifacts

As outlined above, many (sharing) platform operators make use of a variety of mechanisms, systems, and UR artifacts that enable the display of personal as well as transactional information. Importantly, trust is a multidimensional construct and involves different actors and relations on sharing platforms (Hawlitschek et al. 2016d). It is hence important to differentiate between the main actors involved. With regard to the "source" of UR artifacts, it can be distinguished between the *users themselves* (who, e.g., upload a photo or write a self-description), *other users* (who, e.g., write text reviews or issue star ratings), and *the platform* (which, e.g., collects, aggregates, and displays corroboratory or transactional information about users, infers data (Custers 2018), awards badges, and verifies identities).

Additionally, artifacts can be distinguished by the type of information they convey (e.g., personal/non-personal) and their visual display (e.g., pictorial, numerical, textual). Last, there are the resulting user perceptions, behaviors, and market out-

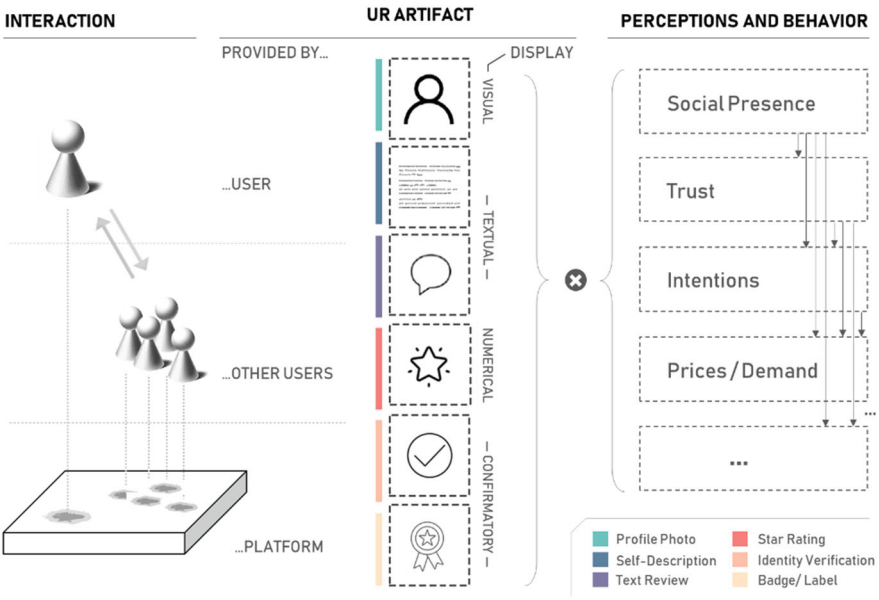

Fig. 1 Sharing economy UR artifact framework

comes caused by the artifacts' presence and specific properties (e.g., social presence, trust, purchase intentions, prices, demand, etc.), which are usually interdependent. Figure 1 summarizes this platform-user interaction, UR artifacts, and outcome variables.

3 User Representation Artifacts

In the following, we explore some of the empirical evidence among the UR artifacts as provided in Fig. 1. There is ample research on the use and effects of UR artifacts in the sharing economy—especially on Airbnb (Dann et al. 2019)—which serves both as a prime example *and* a testbed for platform-related research. Thereby, it is important to note that the UR artifacts employed by Airbnb are widely used across many other platforms.

Profile Photos Faces create trust (Teubner and Hawlitschek 2018). This basic human principle has been widely leveraged by the designers of social media and two-sided market platforms. Several ride-sharing platforms, for instance, prompted their users to complete their profiles, upload pictures, and even provide a filter to search for rides by drivers with a profile photo only. The beneficial effects of profile photos have been demonstrated for various contexts and applications, including accommodation sharing (Abramova 2020; Ert et al. 2016; Ert and Fleischer 2017;

Jaeger et al. 2019), gift-giving networks (Teubner et al. 2013), trust experiments (Bente et al. 2012, 2014), corporate ideation processes (Wagenknecht et al. 2018), and equity crowdfunding (Klement and Teubner 2019). Importantly, *avatars* also engender social presence and trust in a similar way to actual photographs (Al Jaroodi et al. 2019; Teubner et al. 2013, 2014).

Self-Descriptions By deciding which information they disclose, users can determine how they are perceived by others (Tussyadiah and Park 2018). Self-descriptions hence help to create a vivid picture of a particular person and hence allow them to be perceived as a real and multifaceted human being. By making use of self-descriptions, users can trigger expectations of economic and social value (Dann et al. 2020); induce feelings of connectedness, sociability, and intimacy; and hence increase liking and understanding (Altman and Taylor 1973; Janssen et al. 2014). While there exists a range of information that people frequently disclose, information on occupation, personal background, and personal interests is considered particularly beneficial (Ma et al. 2017; Tussyadiah 2016; Zhang et al. 2018).

Rating Scores The trust-building capacity of star ratings as well as the financial premium of a good reputation has been demonstrated repeatedly and for various contexts (Abramova et al. 2017; Teubner et al. 2017). Consequently, recent research has started to shift on the pitfalls and issues of rating systems, such as rating skewness (Teubner and Glaser 2018), rating inflation over time (Filippas et al. 2017), fake reviews (Moon et al. 2020; Wu et al. 2020), as well as rating response mechanisms and strategies (Abramova et al. 2015; Greiner et al. 2020).

Text Reviews The effects of text reviews on user trust and behavior are more complex than numerical scores as they differ in various dimensions such as length, language, valence, and context. Importantly, text reviews combine two important aspects of other trust cues as they are issued by third parties (i.e., credibility such as star ratings) and pertain to personal information (i.e., sociability such as self-descriptions) (Dann et al. 2020). In contrast to most other UR artifacts, text reviews have received little research attention when it comes to assessing their effect through rigorous experimentation.

Identity Verification One means to counter uncertainty, especially against malicious actors on platforms, is identity verification. To do so, the user's face can be screened during a short webcam session, showing their ID card next to their face, possibly having a brief chat with a platform employee passing a basic sanity check. To indicate profile veracity, the platform then shows a small icon that signifies that the user's identity has been certified. While the general idea of verification is widespread across the sharing economy (Hawlitschek et al. 2016c; Mazzella et al. 2016), empirical evidence is still rather scarce. Verification was found to positively influence transaction intentions by increasing trust in the prospective transaction partners (Siegfried et al. 2020). In contrast to other true cues, verified IDs do not, however, necessarily reflect in price markups (Teubner et al. 2017; Xie and Mao

2017). Yet, identity verification represents a popular tool for platform operators as it is inexpensive and can establish a very basic level of trust.

Badges Badges can be regarded as a means for platform operators to address existing weaknesses of reputation systems by introducing additional signals of stellar quality, allowing complementors to stand out even when five-star rating scores are omnipresent. In this regard, Airbnb's *Superhost* badge is one of the most prominent examples for such platform-generated cues (Liang et al. 2017). However, the origin of badges in the gamification literature suggests that their influence exceeds their add-on role in reputation systems. In fact, badges as a simple element of game design have the potential to increase user activity on (sharing) platforms in terms of transactions and comments (Hamari 2017).

Beyond such artifacts, there exist other relevant levers that platform operators employ to promote trust building, including the design (and size) of text input areas (Gebbia 2016) and even the choice of colors (Hawlitschek et al. 2016a). Note that truthful platform design and marketing claims are of particular importance to avoid perceptions of "sharewashing," which may backfire and undermine the platform's trustworthiness in the eyes of current and future consumers (Hawlitschek et al. 2018b). Moreover, beyond strategies to create and increase trust, some measures aim at lowering the necessary levels of trust for users to engage (i.e., the trust thresholds), for instance by providing insurance (Chica et al. 2019).

4 Case Study: User Representation on Airbnb

In this section, we report results from a data-based case study on how hosts and guests present themselves on the accommodation-sharing platform Airbnb through various UR artifacts. To do so, we draw on the online repository InsideAirbnb.com on listing data and user reviews and, based on this, run proprietary web crawlers to extract the relevant information from Airbnb.

Using InsideAirbnb's listing data (*listings.csv*), we identified a random sample of 5000 hosts based in Berlin, Germany, yielding information on name, profile image (URL), rating score, self-description, verifications, etc. Moreover, based on all reviews received by hosts in Berlin (*reviews.csv*) in 2019 (i.e., before the global emergence of COVID-19), we extracted a random sample of 5000 guests. Note that not every transaction is actually reflected in a review and estimates on this fraction vary. Hence this data will be somewhat biased toward "review-writing" guests. While, to the best of our knowledge, data on guests is not provided by any data repository, guests also have profile pages similar to hosts (i.e., a user ID) linked to a unique online profile. By analyzing these profiles, we investigated how guests represent themselves, including their profile image and self-description. For all $2 \times 5000 = 10{,}000$ user profiles (hosts and guests), we manually inspected and categorized the profile photos (portrait-like, multiple persons, etc.). This data allowed us to compare how hosts and guests differ in terms of presenting themselves

Table 1 Summary statistics of hosts and guests

UR artifact	Hosts	Guests	Dif. sig.[a]
Has profile image	99.4%	97.0%	Yes
Portrait-like photo	72.6%	73.3%	No
Multiple persons	11.4%	15.0%	Yes
Person/s visible but no face/s identifiable	8.2%	5.8%	Yes
Objects, landscapes, or buildings	6.2%	2.1%	Yes
Avatar	1.0%	0.8%	No
Has self-description	47.0%	47.2%	No
Explicit statement of occupation	24.3%	19.4%	Yes
Has identity verification	36.0%	73.2%	Yes
Average number of ratings/reviews	19.7	10.7	Yes
Average rating score	94.9	—	—
Also active on the opposite market side	66.7%	8.0%	Yes
Has superhost badge[b]	14.4%	—	—
Fraction of females[(based on name)]	52.4%	49.2%	Yes

Note: [a]Significance of difference based on two-sample proportion test ($p < .05$)
[b]Airbnb issues its superhost badge to "experienced hosts who provide a shining example for other hosts, and extraordinary experiences for their guests" based on transaction volume (≥10 stays), rating score (≥4.8 stars), response rate (≥90%), and cancellation rate (≤1%) (Airbnb 2020)

to the respective other market side. Table 1 provides summary statistics for the usage of UR artifacts by hosts and guests in the sample.

It is worth noting that hosts and guests are very similar in terms of how they present themselves on the platform. Specifically, both groups provide a profile photo almost all of the time, with very similar distributions on what these photos actually show. Moreover, both groups provide a self-description (47%) as well as an explicit statement of their occupation with very similar frequency.

The only stark difference occurs with regard to identity verification, where only 36% of all hosts but 73.2% of all guests make use of this feature. Similarly, both market sides exhibit similar shares of male/female users. Overall, one could expect that this high similarity is rooted in a degree of "side-switching" on the platform (Stummer et al. 2018), that is, users who are active both as hosts and guests. However, while 66.7% of hosts also use the platform to travel themselves, only 8% of all guests are also active as hosts. One possible explanation for this symmetry is the fact that the trust requirements are also mutual due to the high degree of economic and social exposure both for hosts and guests. In consequence, there appears to have emerged a common platform etiquette agreed upon by both market sides.

5 Discussion

We shape our tools, and thereafter our tools shape us. (John Culkin)

In the sense of Culkin's *bon mot*, the selection, design, and use of UR tools have tremendous importance for how our (social and economic) online lives are organized (i.e., who gets what). Such tools must hence not be underestimated. Specifically, as UR artifacts depict actual people, they are likely to reproduce many of the problems inherent to social interactions (e.g., discrimination). Take the most common reputation systems as an example. While objectively designed to be equal for everyone, people's online reputation will, not least, depend on whether they manage to conduct their first transactions successfully. However, based on stereotypes and other factors, not everyone is "equally likely to obtain a first review" at all (Kas 2020, p. 13). Reputation systems may hence even exacerbate gender-, age-, or ethnicity-based inequality. This holds particularly true for sharing platforms, considering that platforms and platform paradigms play an ever-increasing role in our professional and private lives—and their strong dependence on personal characteristics. This also concerns a broad variety of domains, be it for booking accommodation (e.g., Airbnb, Booking.com), finding real estate (e.g., ImmoScout24), ride sharing (e.g., BlaBlaCar, Zimride), selling and buying used goods (e.g., eBay, Gumtree), crowdwork platforms for cleaning (e.g., Helpling), or other tasks (e.g., TaskRabbit, MyHammer), to name just a few.

Given this variety of contexts and perspectives, as we have demonstrated in the previous sections, UR needs to be understood in view of factors such as platform commerciality (e.g., Airbnb vs. Couchsurfing), user professionalism (e.g., eBay vs. Etsy), and user role (e.g., provider vs. consumer). Moreover, requirements will be different for different resource types (i.e., products/services; Hawlitschek et al. 2018c) and the implied degree of social interaction (Hesse et al. 2020a). Last, how and by whom matches are made (e.g., by the users or by the platform) is decisive (Hawlitschek et al. 2016b). Hence, different platforms will leverage different trust cues and combinations thereof to their users but, ultimately, to their own benefit. Much of the information systems literature tends to understand UR as a means to an end, for example, for trust building. In this sense, the main stance is often positive. Yet, despite the undisputed beneficial effects of UR, conveying personal information via these artifacts is not necessarily a straightforward decision, and there are a range of caveats that need to be taken into account. We will briefly touch on four views on the use of UR that have typically either received less attention or are still in emerging states.

1. **Privacy and Discrimination—**Users, platform operators, and regulators have to balance competing interests such as trust building versus protecting user privacy (Teubner and Flath 2019) and mitigating discrimination (Airbnb 2016; Cui et al. 2020; Edelman et al. 2017). Especially profile photos and user names are likely to lead to ethnicity-based discrimination. One response to this (as indicated by the case study above) seems to be that hosts, who are typically much more

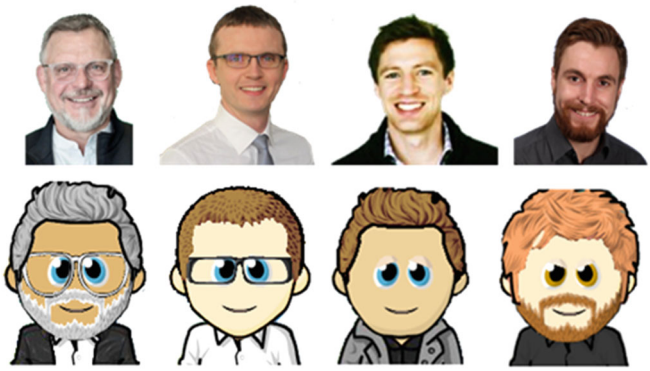

Fig. 2 Avatar examples

accessible to the general public than guests, use semi- or fully anonymous photos. In fact, hosts employ objects, buildings, and landscapes three times more often and obscured faces 40% more often than guests (see Table 1). Another avenue to address the issue of discrimination may be found in the way the different artifacts and other trust cues interact. For instance, while Edelman et al. (2017) found evidence of discrimination against users with distinctively African American (vs. distinctively white) names, Cui et al. (2020) found that this effect disappears once online reputation is available.

It is hence not surprising that some users have reservations about providing personal data online but—at the same time—the need for building trust (in other people, organizations, and digital services) is only increasing. One means to address this dilemma could be trusted agencies that provide certified UR without publishing the underlying data. Similar to the identity verification process described above, profile photos could be verified and replaced by avatars that credibly portray some of the actual facial features (see Fig. 2). Such images are capable of conveying trust levels comparable to the actual photos (Teubner et al. 2013, 2014), without giving away one's actual photo (and the associated biometric information).

2. **Cross-platform Use—**As of today, platforms operate in mostly unconnected silos where each platform maintains its own set of UR artifacts and typically its own reputation system. Given the personal and social importance of UR for trust building and the fact that people use an increasing number of platforms, it should be asked how trust building may also be achieved across platform boundaries. Profiles may, for instance, refer back to information centrally stored elsewhere, for example, to social media accounts or digital identity aggregation services. Recent research has explored the notion of cross-platform signaling based on numerical rating scores (Hesse et al. 2020b; Hesse and Teubner 2019, 2020; Otto et al. 2018; Teubner et al. 2019, 2020). In fact, several e-commerce platforms already offer functions that allow ratings to be imported from other platforms

(e.g., Bonanza.com and Truegether.com, allowing rating imports from eBay and Amazon).

3. **Fake Reviews—**As outlined above, a particularly potent form of UR is ratings and reviews. Unsurprisingly, there has emerged a secondary (and largely illegal) market for this form of reputation. Meanwhile, there is also a rich body of literature on the prevalence and detection of fake reviews for e-commerce platforms (e.g., Amazon), travel platforms (e.g., Yelp, Tripadvisor, Booking.com), app stores, and many more (Wu et al. 2020). Such platforms are particularly prone to fake reviews as they mostly represent open environments in which almost anyone can rate a product, app, hotel, restaurant, employer, medical doctor, or accommodation at little to no cost. However, hardly any research has considered the role of fake reviews within the more secluded environments of sharing economy platforms (such as Airbnb or BlaBlaCar) where the privilege to submit a rating is directly linked to having actually concluded a transaction (including payment). This is by no means to say that there are no fake reviews in such environments, only that the hurdles to (a) commissioning and (b) detecting such reviews are higher. In fact, companies that offer reviews (e.g., fivestar-marketing.net) list a wide range of target markets including Amazon, app stores, Google, Facebook, Tripadvisor, and Jameda, but none of the popular sharing economy platforms (Ge and Voß 2020). Future work may hence want to take a closer look at the prevalence, causes, and effects of fake reviews on sharing economy platforms.
4. **Other Forms of UR—**In times of increasing numbers of online video conferences, it is highly conceivable that video formats will also find their way into the sharing economy. It is noteworthy that placement services such as *Talentcube* use videos to let job seekers present themselves to employers. Depending on context, other forms such as comp cards, git repositories, StackOverflow accounts, or even physiological data may be used (Peukert et al. 2018). Furthermore, it will be interesting to see how developments in IT and platform infrastructure affect user representation. While the use of distributed ledger technology is repeatedly being proposed for sharing economy applications, it is doubtful whether any application that involves physical interactions lends itself well to this technology (Hawlitschek et al. 2018a, 2020).

6 Concluding Note

You never get a second chance to make a first impression. (Andrew Grant)

Given that almost all sharing economy transactions are facilitated between strangers, UR artifacts replace face-to-face encounters in conveying first impressions. In this chapter, we have proposed a conceptual framework that captures the provision and display of widely used UR artifacts and briefly depicted the rich body of empirical evidence on their impact on user perception and behavior. Our analysis

shows that UR artifacts play a critical role in the formation of transactions in the sharing economy, and we observe a range of commonalties in how platforms employ them. We conclude that the role of UR artifacts on sharing economy platforms goes well beyond that of enriching the look and feel of the platform's user interface, even for artifacts that convey features which are not independently verified (e.g., profile photos, self-descriptions). Each individual element has important implications for the way users perceive the level of sociality on the platform, the degree to which they trust one another, and, ultimately, their willingness to engage in actual transactions. Further, our case study on Airbnb demonstrated the strong uptake of UR artifacts by both hosts and guests. We hope that this work provides a useful frame of reference for researchers and practitioners interested in facilitating trust and transactions in the sharing economy.

Acknowledgment This publication was supported by the Open Access fund of Technische Universität Berlin. Support is gratefully acknowledged.

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