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The making of a method: operationalising the process of translation

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Abstract

Purpose – This paper extends the process of translation (PoT) by operationalising it as a methodological device for examining market formation in digitally mediated contexts. While PoT has traditionally been applied retrospectively as an analytical framework, limited guidance exists on how translation moments can be empirically identified as processes unfold. Integrating the PoT with issue mapping, this paper introduces concerned market mapping (CMM), to trace how agencements emerge, evolve and stabilise across digital platforms. Using the #ditchthestraw campaign as an illustrative case, the study demonstrates how problematisation, interessement, enrolment and mobilisation can be systematically identified within digital trace data. The findings show how digital devices participate in reconfiguring market agencements through recursive interactions. This paper aims to contribute methodologically by providing a framework for studying market dynamics in data-rich environments.

Design/methodology/approach – The study adopts a qualitative analysis approach to examine how digital market practices unfold through the PoT. Using scraped Instagram data from the #ditchthestraw campaign, the approach operationalises PoT as a methodological device by developing observable indicators for each translation moment and applying them systematically during coding. CMM integrates PoT sequencing with issue mapping to trace how visual, textual and relational devices reconfigure agencements in real time. This design enables the structured examination of distributed digital interactions and the dynamic formation of sustainable market practices.

Findings – The study demonstrates that operationalising the PoT enables systematic identification of how digital agencements evolve within online sustainability activism. Applying PoT to the #ditchthestraw campaign reveals how visual, textual and relational devices shift roles across problematisation, interessement, enrolment and mobilisation. Issue mapping shows how concerns cluster and reconfigure through digital interactions, highlighting distinct forms of denormalisation and normalisation as the campaign progresses. The findings show that digital devices are actively agencing market practices, moving from raising awareness to modelling alternatives and enrolling new actors. This approach makes visible the distributed processes through which market change unfolds in real time.

Originality/value – This study offers a novel methodological contribution by operationalising the PoT as a device for structuring, analysing and interpreting large-scale digital trace data. Whereas prior research has used PoT primarily as an analytical or retrospective framing tool, this paper develops a systematic, transparent procedure for empirically identifying translation moments as they unfold. By integrating PoT with CMM, the study extends the methodological repertoire of market studies and demonstrates how distributed agencing can

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be traced in real time on visual-first platforms. This approach provides new possibilities for examining digital market formation and sustainability activism.

Keywords Concerned market mapping, Digital research, Market studies, Methodological device, Process of translation

Paper type Research paper

The process of translation as a methodological device

From a market studies perspective, markets are not static structures, but dynamic, socio-technical arrangements shaped by heterogeneous actors and devices (Callon, 2008; Cochoy, 2014a). Market studies have conceptualised these arrangements through notions of agencement and agencing, emphasising the active reconfiguration of associations, devices and meanings (Cochoy, 2014b). To trace such processes empirically, some scholars have drawn on the process of translation (PoT) (Callon, 1986), which conceptualises market formation through four moments: problematisation, interessement, enrolment and mobilisation. While these views have advanced understanding of market dynamics, methodological tools for tracing such processes remain underdeveloped. Existing applications of the PoT are largely retrospective, analysing these moments after the fact (see Duguay, 2017), which risks overlooking real-time reconfigurations and overlapping actor roles.

Building on Callon's PoT and informed by Marres' issue mapping (2015), this paper introduces concerned market mapping (CMM) as an approach to study how markets become sites of concern. CMM enables the systematic visualisation and tracing of networks of actors, devices and emerging market concerns across digital platforms. Responding to calls for more transparent and transferable methodologies in market studies (Roscoe and Loza, 2019), our integration of issue mapping with PoT offers a perspective on how markets change and develop through ongoing interactions. This approach translates PoT's theoretical moments into empirical indicators and supports detection of overlapping and recursive translations in large data sets. The mapping approach provides a practical, replicable tool for studying distributed digital market practices. Its broader adaptability is illustrated through the #ditchthestraw movement, a campaign centred on opposing the use of single-use plastic straws. The development of the #ditchthestraw movement unfolds through visible digital interactions among diverse actors advancing alternative market practices.

This paper contributes methodologically to market studies by clarifying the distinct roles of PoT and CMM. Firstly, it demonstrates how PoT (Callon, 1986) can be operationalised as a methodological device by translating PoT's four moments into empirically observable indicators that structure organising, sequencing and coding of digital trace data. Secondly, building on this methodological foundation, CMM was developed as an analytical framework for examining how market concerns emerge, circulate and stabilise through socio-material configurations. By integrating issue mapping with the logic provided by PoT, CMM enables the study on how actors and devices shift roles across overlapping moments of translation. This is important because it enables the systematic tracing of how market concerns emerge, shift and stabilise through socio-material interactions in a digital environment.

Market studies approach and the challenge with digitalisation

From a market studies perspective, markets are continuously performed socio-material arrangements (Callon, 2008). Central to this view is agencement, a heterogeneous configuration of human and non-human elements, including actors, devices and calculative tools, that enables particular forms of market action (Callon, 2008). Agencing refers to the ongoing work through which these elements are aligned, destabilised and reassembled,

allowing markets to emerge and transform over time (Callon, 2008). This perspective shifts attention from individual actors to the relational and performative dynamics through which markets are enacted. This focus becomes particularly salient in digital contexts where platforms, images, hashtags and users interact in distributed and evolving ways. As digitalisation introduces new actors and reconfigures relationships with traditional market players, market studies offers a useful lens to examine these developments (Hagberg and Kjellberg, 2020). This is evident in grassroots movements that leverage digital tools to drive social change (Mathers, 2024). Yet researchers still face challenges in tracing the fluidity of market actions and formations, largely due to limited methodological approaches suited for the dynamic and evolving nature of markets. Digital environments generate heterogeneous and rapidly changing data sets in which actors and devices continually shift roles. Traditional qualitative tools often struggle to capture these dynamics, focusing on static themes or rich description without a means of systematically tracing temporal and relational change. Recent work argues that market studies have prioritised "thick descriptions" of markets while lacking methodological tools capable of tracing the relational dynamics that underpin market action in digital environments (Lee *et al.*, 2024). Content-analytic approaches have been criticised for cataloguing elements without capturing how they become effective through enrolment in broader assemblages of market practice (ibid). These critiques reinforce the need for methodological designs that remain sensitive to socio-material relations while scalable to large digital data sets. To navigate this challenge, researchers are often encouraged to draw on multiple methods to adequately represent the complexity inherent in market phenomena (Mason, 2024). Responding to these discussions, the present study uses the PoT as a methodological device to examine how socio-material dynamics unfold within large-scale digital data.

Operationalising the process of translation

To examine how agencements are formed and reconfigured, scholars within science and technology studies (Latour, 1987) and market studies (Callon, 1998) have drawn on Callon's PoT (1986). PoT conceptualises collective action as unfolding through four analytically distinct yet overlapping moments: problematisation, interessement, enrolment and mobilisation. According to Callon (1986), problematisation involved the articulation of a shared problem and the definition of an obligatory passage point. Interessement, he explains, refers to efforts to stabilise identities and disrupt existing attachments; enrolment concerns the recruiting and aligning of actors around proposed roles, and mobilisation denotes the enactment and extension of these roles within a broader network. While PoT has proven analytically powerful for understanding how markets and socio-technological arrangements take shape, its moments are often invoked retrospectively, leaving open the question of how they might be identified empirically as processes unfold.

Prior studies have mobilised PoT as an analytical framework to interpret market and organisational phenomena. For example, Freeman (2009) explores how meanings and networks are negotiated, while Duguay (2017) analyses how digital platforms translate concerns about authenticity into technical and social arrangements. These studies highlight PoT's value in revealing how actor-networks are stabilised and contested. Building on these contributions, the present study extends PoT by examining how the moments themselves can be translated into empirically observable indicators that guide data organisation, coding and analysis within large-scale digital data sets.

Table 1 outlines how PoT has been used across different domains. Furthermore, it highlights a gap that the present work addresses, demonstrating how PoT can be used as a

Table 1. Previous uses of the process of translation

Researcher	Use of the process of translation	Empirical application	Contribution
Callon (1986) – Some elements of a sociology of translation	Introduces the process of translation to explain how actor-networks form and stabilise	Case of marine biologists, fishermen, and scallops in St Brieuc Bay	Establishes PoT as a foundational framework in STS; shows how scientific knowledge and socio-technical networks co-evolve
Aboelenien and Arsel (2024) – The shaping of marketplace moral sentiments	Mobilises PoT as an analytical lens to theorise how marketplace moral sentiments are shaped through iterative translation across actors	Meta-synthesis of 101 market cases (e.g. tattoos, cannabis, meat, medical masks)	Extends PoT to morality in markets; develops typology of sentiments as outcomes of translations
Smith *et al*. (2010) – The story of a university knowledge exchange	Applies PoT to trace how knowledge exchange (KE) networks in universities emerge and stabilise	Case study of KE in a UK management school, based on interview data	Shows how KE actor-networks adapt to shifting policy and funding; highlights non-human actors
Duguay (2017) – Dressing up Tinderella	Combines PoT with Giddens' authenticity to examine how digital platforms translate concerns about authenticity into technical and social solutions	Tinder app: walkthrough analysis of its design, promotional materials, and user discourses	Reveals how Tinder frames authenticity through Facebook integration and normative identity claims; shows how translation can both stabilise and be overflowed by user resistance

Source(s): Authors' own work

methodological tool for structuring empirical inquiry and tracing the active work of agencing in distributed, digital contexts.

During the development of this research, a central methodological challenge concerned how to identify empirically the four moments of translation within large-scale digital data. Although PoT has been widely applied as an analytical framework (Callon, 1986), the literature offers limited guidance on how its moments can be operationalised in practice. To address this, PoT's conceptual attributes were translated into explicit empirical indicators that structured data organisation and coding. Public Instagram posts were scraped using dedicated software, generating a data set that required iterative engagement between theory and data. Each post was examined to determine whether it reflected problematisation, interessement, enrolment, mobilisation or overlapping moments. Thus, PoT was repositioned from a retrospective interpretive lens to a methodological device for tracing translation as it unfolded, rendering its moments observable through patterned visual, textual and relational signals in digital data. Furthermore, it allowed for the dynamic tracing of how actors and devices enter and exit the frame, revealing the roles they performed and the configurations through which they become implicated in the phenomenon being examined.

Integrating issue mapping

Issue mapping offers a complementary means of examining how concerns emerge and circulate across digital environments (Marres, 2015). It highlights the relational configurations through which issues gain coherence, drawing attention to how objects, devices, hashtags and users collectively articulate and contest market concerns. While issue mapping effectively represents relational complexity, it provides only limited insight into how problems, roles and

alignments shift over time. In contrast, PoT (Callon, 1986) offers a dynamic framework for tracing such shifts but lacks the methodological apparatus to visualise them at scale in distributed digital contexts. Bringing the two approaches together, therefore, allows each to counterbalance the other: issue mapping materialises the relational dynamics through which translation unfolds, and PoT provides the conceptual structure for distinguishing the kinds of agencing at work.

CMM is proposed in this paper as a methodological device that integrates Callon's (1986) PoT with Marres' (2015) issue mapping. Rather than serving solely as an analytical lens, CMM structures the research process by translating PoT's four moments into empirically observable indicators that guide data organisation, coding and visualisation. In doing so, this study situates CMM within the broader methodological tradition of market studies, complementing processual and relational approaches such as marketography (see Roscoe and Loza, 2019) while extending the capacity to trace translation dynamics in large-scale, digitally mediated environments. Issue mapping (Marres, 2015) provides the relational and visual layer through which market concerns are traced, while PoT supplies the processual logic for distinguishing different forms of agencing at work. Together, these components enable the nuanced examination of how market concerns are articulated, negotiated and stabilised across large-scale digital data sets (Lee *et al.*, 2024).

Applying concerned market mapping

The application of CMM unfolds through a series of structured stages designed to maintain transparency and enable methodological replication. Within this process, PoT is not only used as an analytical lens but also as a methodological device that shapes the constitution of the empirical field. Digital data is technically gathered through the identification of a focal market concern and its associated digital traces, operationalised here through the hashtag #ditchthestraw. However, PoT reconfigures as a methodological device here because it informs what is recognised in this space. PoT guides what is understood as data, which actors, devices and concerns are followed. In this sense, PoT shapes sampling decisions and structures the sequencing of observations according to the PoT. PoT directs how translation processes are identified, differentiated and traced as they unfold instead of being applied retrospectively to interpret an already defined data set.

The *first stage* involves the systematic collection of digital trace data that relate to the focal concern. Data collection typically uses an automated web-scraping tool (such as Phantombuster, which was used for this research) to retrieve publicly accessible social media posts associated with predetermined query terms or hashtags. Scraping parameters include the selection of relevant search terms, the time-based range of the inquiry and the types of media to be captured, together with the extraction of associated metadata such as user handles, URLs, captions, engagement metrics, posting dates, locations and the full set of accompanying hashtags. The resulting data set is exported into a structured file format (for example, Excel or CSV) and stored securely. Ethical considerations form part of this stage and include the exclusion of private or deleted content and the anonymisation of user identifiers where appropriate. As Instagram users consent to platform terms permitting access to publicly shared content (Meta, 2024), and as hashtag use situates posts within broader public discourse (Townsend and Wallace, 2016), the data analysed here are treated as publicly available. However, distinctions between public and private online environments remain important, with hashtagged content associated with a reduced expectation of privacy (ibid). Accordingly, data were anonymised and handled with care to minimise potential harm. The *second stage* consists of cleaning and preparing the data set for analysis. In practice, this involves removing duplicate entries and eliminating spam content, filtering

posts according to relevance or language and addressing inconsistencies created by scraping artefacts. Once cleaned, the data set is imported into qualitative analysis software such as NVivo, which serves as a platform for organising, reviewing and categorising posts. This stage ensures that the material is analytically workable and that subsequent coding is conducted on a coherent and consistent data set.

The *third stage* introduces an initial descriptive and organisational layer to the analysis. Posts are categorised according to relevant attributes, such as media type, and examined for recurrent textual and visual patterns. Exploratory analyses may include identifying frequently co-occurring hashtags, noting prominent visual motifs or mapping the distribution of post types. Although preliminary, this descriptive work provides essential context by establishing how the issue circulates within the data set before theoretical coding is applied.

The *fourth stage* involves the operationalisation of the PoT through a set of explicit indicators linked to each of its four moments. These indicators guide the coding of posts by identifying empirically observable indicators of problematisation, interessement, enrolment and mobilisation. Each post is examined in terms of both its visual composition and visual and textual content and may be assigned multiple PoT codes where moments overlap. Coding is primarily qualitative and interpretive but conducted systematically. While guided by clearly defined indicators, the coding process involved interpretive judgment in identifying how moments of translation were expressed across posts. For example, for this research, posts depicting environmental harm or defining a shared problem are coded as problematisation; posts interrupting established consumption practices or proposing sustainable alternatives are coded as interessement; content that stabilises new roles or explicitly invites others to participate is coded as enrolment; and posts demonstrating enacted behaviour change or amplified commitment are coded as mobilisation. Through this process, the data set is transformed from a heterogeneous collection of posts into a structured analytical representation of translation processes.

The *fifth stage* centres on mapping and visualisation. Using the coded data set, adjacency matrices [1] are constructed to capture co-occurrences among actors, hashtags, devices or coded attributes. For this research, NVivo was used to create the matrices based on the coding used. These matrices are then imported into network-mapping software such as Social Network Visualizer or Gephi, where relational maps are generated. In these maps, nodes represent entities (e.g. actors, devices and market concerns), and edges reflect their associations based on co-presence within posts. Filters may be applied to isolate relationships pertinent to each PoT moment, allowing for the production of both moment-specific and composite visualisations. These maps serve as analytical devices for identifying clusters, bridging elements, central actors and shifts in association patterns over time.

The *sixth stage* introduces an iterative and reflexive dimension to the analysis. Mapping outputs frequently reveal unanticipated associations or emergent clusters that warrant further examination. In such cases, the visualisations prompt the re-inspection of posts, the refinement of coding decisions or the adjustment of PoT indicators to better reflect observed patterns. This recursive movement between coding and visualisation mirrors the processual nature of translation itself and ensures alignment between theoretical expectations and empirical findings.

The *final stage* involves interpreting the mapped configurations in light of PoT's processual logic. Interpretation focuses on how the concern is articulated and stabilised, how actors and devices align around shared problem definitions, how new practices or roles emerge, and how these are extended and reproduced through digital interactions. Through the integration of coded content and relational visualisation, this stage draws together the socio-material dynamics made visible through CMM and provides an empirically grounded

account of how market concerns are assembled, contested and reconfigured. This multi-stage process produced a set of empirically grounded outputs that enabled the identification of key insights into how market concerns are translated and reconfigured in a digital context.

Outputs of concerned market mapping

Through the comprehensive operationalisation of PoT with CMM, the study produced three main outputs: (1) a structured record of how PoT moments are distributed across digital material, enabling reproducibility and comparison across cases. (2) Visual representations of how actors, devices and market concerns connect, evolve and stabilise. (3) A processual account of translation that moves beyond description to trace socio-material reconfigurations as they occur.

Within CMM, issue mapping allows researchers to identify which actors and devices become central or peripheral, how market concerns are articulated and connected, and how collective actions shape the broader agencement. This aligns with Lee *et al.*'s (2024) contention that digital artefacts must be followed and mapped as actors, with analytic attention directed not only to their content but to the relations they mobilise. Whereas Lee *et al.* (2024) focus primarily on textual co-occurrence, CMM extends this relational mapping to include images, tagging practices and post compositions, elements fundamental to performative activism on visual platforms such as Instagram and through which PoT's moments can be traced. In this way, CMM moves beyond static or thematic analyses that capture only isolated snapshots of market discourse. Instead, it offers a dynamic, relational perspective, showing how concerned markets take shape over time. Beyond the illustrative case of #ditchthestraw, CMM is applicable to a range of digitally mediated market contexts where market concerns are articulated and contested through platform practices. These include campaigns addressing fast fashion and labour conditions, online controversies surrounding food sustainability and alternative proteins and digitally organised consumer movements challenging platform governance or data privacy practices. In each case, CMM offers a means of tracing how market concerns are translated into market attachments and enacted through distributed socio-material configurations. This includes digitally mediated movements, platform governance controversies and emerging markets organised around ethical consumption, where market concerns circulate through distributed socio-material configurations.

Similar to semantic network analysis, which examines link strength between co-occurring concepts to reveal systematic features in a data set (Lee *et al.*, 2024), issue mapping extends this logic qualitatively by following how actors, devices and market concerns become interconnected through digital traces. Rather than merely counting occurrences, it reveals patterned relations that underpin the collective construction of a concern, showing how coherence emerges through repeated linkages and co-appearances across posts. In doing so, issue mapping contributes to what Lee *et al.* (2024) describe as the effort to 'quantify the qualitative,' making visible the structural organisation of meaning while preserving attention to the socio-material composition of digital market practices.

Demonstration case: the #ditchthestraw campaign

To demonstrate the use of CMM, this paper focuses on the illustrative case of #ditchthestraw, an anti-single-use plastic straw campaign. This campaign is particularly well-suited as an example because it embodies the core features of dynamic, distributed agencing. The campaign is not directed by a single actor but emerges from the collective actions of multiple actors who each contribute to defining the problem and promoting solutions. As the anti-single-use straw movement gained traction, it mobilised diverse publics and encouraged shifts in consumption practices, eventually influencing policy and brand responses. By

tracing the campaign back to its origins, this study examines how such mobilisation unfolded and how moments of translation materialised through these distributed interactions.

Applying the CMM to the #ditchthestraw campaign

The empirical application of CMM was conducted using a data set of publicly available Instagram posts associated with the query "#ditchthestraw," collected through the automated scraping tool Phantombuster. The data set spans 27 February 2014–13 November 2021 and comprises 3,840 posts, each including metadata such as captions, hashtags, media type, engagement metrics, date and location. Data was exported to Excel, cleaned to remove duplicates, spam and non-English posts and subsequently imported into NVivo for organisation and coding. Ethical procedures followed established digital research procedures, including the exclusion of private or deleted content and anonymisation of user identifiers where appropriate.

The PoT was operationalised through the empirical indicators outlined in Table 2. Posts were coded according to whether their visual and textual content reflected problematisation, interessement, enrolment, mobilisation or overlapping moments. Coding combined systematic qualitative interpretation with consistent application of PoT indicators, allowing translation moments to be traced across the data set. Adjacency matrices generated in NVivo from the coded data were imported into network-mapping software to produce issue maps corresponding to each moment of translation. These maps functioned as analytical devices, revealing relational clusters, bridging devices and shifts in actor and device roles over time.

The analysis proceeded iteratively, with visualisations informing refinements to coding and indicator specification. This recursive movement between coding and mapping enabled systematic tracing of how actors and devices entered, exited and shifted roles across translation moments. Interpreting the mapped configurations through PoT's processual logic made it possible to identify how problem definitions were stabilised, how participation expanded and how new practices became enacted and reproduced across the digital

Table 2. Process of translation methodological indicators

Moment of PoT	Methodological indicator
Problematisation	Content that frames SUPSs as harmful by linking them to environmental damage or pollution. This includes images, captions or hashtags depicting negative outcomes and positioning the elimination of SUPSs as the only viable solution, thus establishing an obligatory passage point
Interessement	Content that seeks to destabilise established practices involving SUPSs and promote alternative, more sustainable behaviours. This includes discourse, images or hashtags that challenge existing norms, highlight negative consequences or offer alternative consumption guidelines. Efforts to disassociate users from harmful practices and encourage new alignments framed as necessary, urgent, and desirable
Enrolment	Content in which users actively recruit others to join the movement. This includes calls to action, tagging, campaign-related hashtags, encouragement of participation by others, and the use of social pressure through public critique. Enrolment is visible when posts aim to expand participation through direct solicitation, positive reinforcement or normative appeals
Mobilisation	Content showing that the goals of the agencement have been enacted. Mobilisation is indicated by actors adopting new practices and integrating them into their identity, often through images, captions or hashtags. This includes posts by individuals, businesses or institutions demonstrating behavioural change or declaring policy shifts aligned with the original problematisation

Source(s): Authors' own work

agencement. The #ditchthestraw campaign provides an empirically rich demonstration of this processual dynamic, revealing how concern for environmental harm emerged, circulated and stabilised through distributed interactions among heterogeneous actors and devices. In the following section, the CMM process is presented through the sequential moments of PoT. This demonstrates how each stage of translation became empirically observable with the data (see Table 2). Through this application, CMM operationalises PoT as a methodological device for tracing evolving market concerns in large-scale digital environments.

Problematisation

PoT is often discussed as the foundational moment of the translation process (Callon, 1986). This stage establishes the necessity for change by conveying the problematic outcomes of existing system conditions. Problematisation is essential in this process as it frames the current situation as untenable, opening others up for change (Flaig *et al.*, 2021). While scholars provide an understanding of what problematisation does (Callon, 1986; Flaig *et al.*, 2021), the question remains: how can problematisation be identified within data?

To address this question, the conceptual attributes of problematisation were translated into empirical indicators. In the empirical data, problematisation was identified where posts linked Single-use plastic straws (SUPSs) to environmental harm and framed their elimination as necessary, establishing an obligatory passage point. Specifically, instances of problematisation were coded when discourse or imagery highlighted the damaging impacts of SUPS practices and positioned the elimination of SUPSs as the only logical solution, thereby establishing an obligatory passage point.

Interessement

Callon (1986) described interessement as the phase during which attempts are made to impose and stabilise the identities of the actors established during problematisation. In this stage, actors use strategies to position the problem in a way that appeals to others, making engagement seem desirable, necessary or inevitable.

To identify interessement, by focusing on instances where efforts were made to denormalise consumption practices involving SUPSs and to normalise alternative, more sustainable behaviours. Such efforts were identified through images, discourse and hashtags that articulated guidelines or expectations regarding how market practices should evolve (Kjellberg and Helgesson, 2007). In empirical data, interessement was often manifested through coordinated campaigns that sought to interrupt or destabilise established consumption practices associated with SUPSs. These artefacts worked to disassociate actors from previously normalised behaviours, brands or products by highlighting negative consequences, promoting alternative actions or casting doubt on existing attachments. Researchers identified and coded these moments by tracing efforts to weaken existing ties, challenge the legitimacy of competing practices and establish new points of attachment around the identified concern. These manifestations included both discouragement of SUPS use and the positive representation of new consumption norms, as framed by market actors seeking to reshape everyday practices.

Enrolment

During the stage of enrolment, efforts are made to enlist other actors to believe in and support the identified cause (Latour, 1987). At this point in the PoT, actants align with the defined goals and responsibilities of the agencement. They become "allies" and engage actively in the unfolding network (Callon, 1986). In digital environments, platforms such as Instagram provide effective and interesting mechanisms for facilitating enrolment by enabling users to rapidly mobilise networks of friends, family and broader audiences (Saxton and Wang, 2014).

Again, for this research, it was necessary to establish specific indicators, so it was understood when the moment of enrolment was being observed. For the purposes of this research, enrolment is understood as actions within the #ditchthestraw campaign where users actively sought to recruit others to join the movement. Such actions were identified by several empirical indicators, including explicit calls to action, the strategic use of digital devices to engage others, the encouragement of businesses and individuals to align with the campaign's objectives and the application of social pressure through the public critique of undesirable practices. Enrolment was therefore identified when posts demonstrated efforts to actively expand participation, whether through direct solicitation, positive reinforcement or normative pressure.

Mobilisation

The moment of mobilisation is where alignment and agreement among network actors become evident (Laasch *et al*., 2020). Callon (1986) described mobilisation as the enactment of previously defined roles within the spaces actors inhabit, directed towards addressing the focal problem identified during problematisation. Mobilisation involves actors appropriating the message, integrating it into their own identities and carrying it forward into other contexts (Laasch *et al*., 2020). At this stage, the reconfigured agencement becomes stabilised and enacted through practice, as actors begin to perform and reproduce the newly aligned market configuration. While these scholars provide a clear theoretical account of the moment of mobilisation, challenges remain in determining how to identify and observe mobilisation especially within large data sets.

For the purpose of this research, mobilisation is identified as visual artefacts or textual communication that makes clear that the goals set at the conception of the agencement have come into fruition and are put into action. Mobilisation can be made visible through actors, agencing devices such as captions and hashtags. Specifically, for this research, it is when the actors within the agencement demonstrate they have made a change to their single-use plastic practices through attempts to incorporate it as part of their identity. This may be signalled through displays of consumption practices or an indication that this new practice has been adopted as part of the user's identity through the use of hashtags. This may be viewed through restaurants, businesses or government localities declaring a change in their practices or regulations through images or discourse. Mobilisation is visible when the post contains images or discourse that represents the user's implementation of the original obligatory passage point (the elimination of SUPSs).

Insights from concerned market mapping

The use of CMM is vital in digital research, as platforms enable users to create content encompassing multiple moments simultaneously. Using CMM highlighted how #ditchthestraw took shape and evolved, revealing how visual and textual tactics challenged norms and fostered environmental awareness. Categorising content solely by surface features would obscure the performative roles that actants play across different moments of PoT. One clear example is the evolving use of the turtle. During problematisation, an image of a turtle injured by a plastic straw (Plate 1) circulated widely, framing SUPSs as devices of environmental harm. In agencing terms, this image acted as a device reconfiguring the meaning of single-use plastics within the agencement. Without the PoT framework, it would appear merely as a thematic symbol; here, it represents a deliberate act of reconfiguration. As the campaign progressed, the turtle's function shifted. In the phase of enrolment, it was repurposed as a unifying campaign symbol to invite participation (Figure 1). The sequencing enabled by PoT exposes how the same image performs different work across the

Plate 1. Sea turtle injured by a plastic straw, illustrating the problematisation of plastic straw consumption through the visualisation of environmental harm

Figure 1. Instagram post linking marine wildlife protection to plastic straw reduction through emotionally framed problematisation

campaign – moving from emotional problem framing to participant recruitment. A purely thematic account would miss this strategic reconfiguration, masking the image's central role in shaping the campaign's market influence.

The process of translation as a methodological device: making moments empirically visible

This section reviews what was observed through the operationalisation of Callon's (1986) four moments of translation. The section traces how actors, devices and market concerns shifted roles across these moments, revealing the staged yet overlapping dynamics through which the agencement evolved.

Visualising problematisation

Through CMM, this research identified agencing activities that foregrounded the problematisation of SUPSs as environmentally destructive and socially unacceptable. Issue mapping reveals the material and symbolic construction of this framing, linking images of turtles, other animals, oceans and pollution to campaign messages. Plate 2 shows how problematisation emerges through focal codes such as #savetheturtles and materiality – animal/turtle, emphasising the urgency of protecting marine life. These relatively isolated nodes underscore a deliberate focus within problematisation: the campaign frames single-use plastics as an immediate threat to marine life rather than situating them within broader environmental debates or solutions. This focus created a

Plate 2. Beach clean-up photograph illustrating the problematisation of plastic straw consumption through the material accumulation of plastic waste

clear narrative by highlighting the direct harm that single-use plastics caused to marine life as a stand-alone problem that demands quick attention.

Some devices can be observed in the moment of problematisation, with hashtags such as #plasticfree, #ecofriendly and #zerowaste strongly connected to this phase. As these are not problematisation actors or devices, their involvement suggests they act as agencing tools to expand the post's reach to others interested in the message. The findings illuminated by the issue map show how actors define SUPSs as problematic by visually linking plastic consumption with environmental harm. Posts coded as problematisation frequently paired images of marine animals or polluted beaches with hashtags expressing calls to reject plastic, such as #stopsucking, #saynotoplastic and #savetheplanet, which appear in close relational proximity on the issue map.

These hashtags operate as bridging devices: while originating in harm-framing posts, they simultaneously discourage the continued use of SUPSs, signalling that denormalisation begins within early problematisation activities rather than emerging only later in the campaign. The issue map, therefore, visualises the overlap between these stages through clusters where environmental harm imagery connects directly to normative directives encouraging behaviour change.

Through the structuring of the data set using PoT indicators, instances of problematisation were identified where actors explicitly linked SUPSs to environmental harm. This was evident in posts coded as problematisation that paired emotionally charged visuals of marine animals (Figure 1) and polluted beaches (Figure 2) with captions such as "save the turtles" and hashtags including #savetheturtles and #noplastic (Figure 3). These devices functioned to materially foreground the consequences of SUPSs and position their elimination as the only viable response.

Figure 2. Instagram caption illustrating interessement through the use of hashtags to connect #DitchTheStraw with broader environmental concerns

Figure 3. Instagram post promoting reusable straws as an interessement device for alternative consumption practices

Visualising interessement

Interessement marked a reconfiguration in the agencement, where actants from problematisation (e.g. turtles, oceans) faded, and broader, less emotionally anchored language (e.g. #saynotoplastic) became prominent. The issue map reveals that interessement in #ditchthestraw manifests in two distinct ways: through denormalisation and normalisation. The map also shows that interessement involves more interconnections than problematisation and a notable increase in hashtag use. Issue mapping complements this by visualising those coded relations at scale, showing how denormalisation and normalisation cluster as distinct yet connected configurations within interessement (Figure 4).

Figure 4. Instagram post encouraging consumers to question the necessity of plastic straws as an interessement strategy

Normalisation uses visual and textual content, such as images of beverages with plastic alternatives, to promote new consumption norms. The issue map also shows that normalisation holds the highest number of interconnections, indicating that many actants are focused on establishing new consumption practices as the dominant market version. Interestingly, promoting straw-free consumption plays a smaller role. Although the campaign is titled #ditchthestraw, the map suggests greater emphasis on promoting alternatives rather than eliminating straws entirely.

Where actants such as turtles, oceans and pollution, which were central to the emotionally resonant framing of problematisation are no longer prominent subjects of images or captions, the discourse pivots to more abstract and generalised appeals, with hashtags like #savetheplanet and #saynotoplastic (Figure 3) becoming increasingly visible. This shift signals a move away from emotive visual storytelling toward broader, collective calls to action and environmental responsibility. PoT's sequencing reveals how these acts accumulate and transition across moments.

To trace these dynamics, posts were categorised according to denormalisation or normalisation strategies. Normalisation appeared in content modelling alternative practices, for example, images of drinks without straws (Figure 5). Denormalisation reframed SUPSs as harmful and outdated (Figure 6). The issue map provides the empirical grounding for this observation: denormalisation and normalisation form separate relational clusters (Issue Map 2), with different devices occupying distinct positions within the network. Visual representations of new sustainable practices are becoming more central, whereas written critiques of consumption remain on the margins. This suggests a shift from disrupting current consumption patterns to enacting alternative ones.

Visualising enrolment

Observations of the moment of enrolment found a noticeable shift in the use of devices used during this phase, specifically in the deployment of hashtags and tagging. While

Figure 5. Instagram caption extending interessement by linking #DitchTheStraw to wider sustainability discourses through multiple environmental hashtags

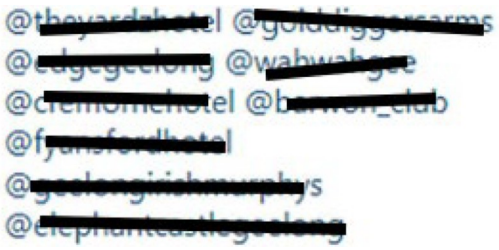

Figure 6. Instagram post illustrating enrolment through the tagging of organisations and individuals within the #DitchTheStraw network

interessement emphasised shifting narratives through emotionally and ecologically resonant hashtags (e.g. #savetheplanet), the enrolment phase reflects a more refined and targeted strategy. The issue map (Figure 7) reveals a refined strategy where hashtags and tagging not only gain prominence but are crucial in broadening the campaign's outreach. Hashtags serve as calls to action, such as #doyourbit and #savetheturtles, while others in the issue map extend communication to users with similar interests, such as #ecofriendly and #zerowaste. These, alongside tagging for enrolment (signalled in the map as Enrolment through Tagging), are instrumental in connecting unrelated users to the movement, significantly expanding visibility beyond one's immediate network.

Such mechanisms are vital for rapidly disseminating campaign messages, rallying support and driving collective action. While the issue map showcases the early reconfiguration of engagement, emphasising overlap between enrolment and interessement through strategic hashtag use, the enrolment map explores deeper into how social media amplifies reach and impact. The issue map shows how tagging and broader, more deliberate hashtag use function as bridges, linking campaign stages and supporting a cohesive narrative that amplifies reach. This strategy marks a shift from merely identifying sustainability issues to building a networked platform for widespread societal engagement and action.

Plate 3 demonstrates how hashtags function as symbolic calls to action (e.g #doyourbit). Furthermore, tagging and mentions (Plate 4) emerge as a significant device for enrolment, as

Figure 7. Instagram challenge illustrating enrolment by inviting consumers to participate in a collective plastic straw reduction initiative

Plate 3. Consumer displaying a reusable straw, illustrating enrolment into alternative consumption practices

did using addition, seemingly non-related hashtags (Plate 3), aimed at extending the campaign's reach beyond immediate networks. PoT's methodological use ensures that such incorporations are not simply catalogued as "engagement" but are situated in the specific phase of network expansion.

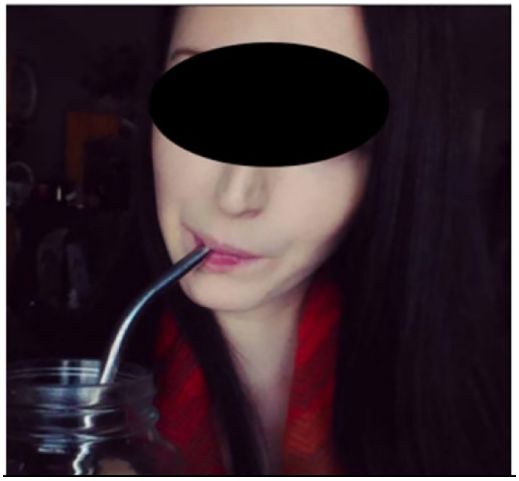

Plate 4. Consumer using a reusable metal straw in everyday practice, illustrating the mobilisation of reusable alternatives

During enrolment, it was also able to observe offers for temporary change (Figure 8), which included invitations to trial alternative practices without long-term commitment, creating low-barrier entry points. These enrolment strategies are instrumental in drawing new actors into the agencement and advancing the realisation of a market shift. When coded through PoT indicators, these features functioned as enrolment work, expanding participation and stabilising alignment.

Visualising mobilisation

The moment of mobilisation illustrated the evolving role of the agencement in fostering sustainable practice change. The issue map for mobilisation (Figure 9) makes visible a strong interconnection between mobilisation and images of people, beverages and plastic alternatives. These findings are likely because mobilisation manifests in posts where people declare and demonstrate a change in their single-use plastic consumption practices. The observed overlap suggests that consumer actions are influenced by observed online practices and that efforts to normalise sustainable consumption practices on digital platforms often

Figure 8. Instagram post illustrating mobilisation through an organisational commitment to becoming plastic straw free

Figure 9. Hospitality venue communicating a 'straws on request' policy, illustrating the mobilisation of new consumption practices

mimic mobilisation activities. The CMM framework differentiates between the intentions behind normalisation and mobilisation, focusing on their specific objectives and outcomes. Interestingly, during this phase, there is a noticeable absence of hashtags in the issue map, despite hashtags like #ecofriendly and #sustainablelife being prominent in the hashtag analysis. The absence of these elements suggests that, in this context, hashtags may serve more to extend audience reach than directly mobilise action.

The issue map demonstrates how images become the primary means through which sustainable behaviours are modelled, promoted and normalised made clear through the node size and colour. This shift from symbolic representation to visual enactment suggested a deepening of the campaign's strategy, which was no longer merely encouraging awareness or engagement, the campaign now actively mobilises individuals as depicted by these examples (Figures 10 and 11). The high frequency of beverage images with plastic alternatives suggests a widespread adoption of the campaign's framing but mobilisation was further

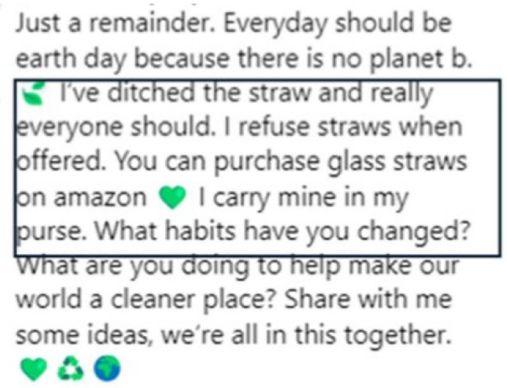

Figure 10. Instagram post encouraging the continued refusal of plastic straws while promoting reusable alternatives, illustrating the mobilisation of anti-plastic straw practices

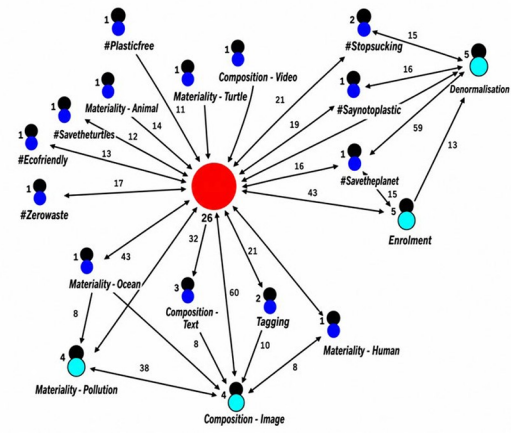

Figure 11. Problematisation map
Source: Authors' own work

evidenced by the circulation of posts showing institutional uptake (Figures 12 and 13) (e.g. restaurants banning plastic straws).

Mobilisation was identified by tracing posts that demonstrated broader adoption and stabilisation of the campaign's framing beyond its original network. Here, agencing reaches a point where the agencement's new configuration is sufficiently stabilised to be enacted in other contexts. Examples include posts celebrating institutional changes, such as restaurant bans on plastic straws, and community-wide participation in campaigns. These cases were based on clear indicators of widespread uptake (Figure 14) and replication of practices.

Mobilisation was identified through images of individuals using reusable straws, demonstrating enactment of the solution defined earlier and embedding the obligatory passage point (eliminating SUPSs) in practice. Such visual evidence indicated that new

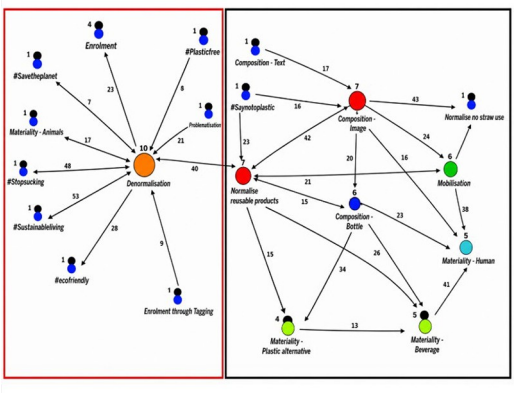

Figure 12. Interessement map
Source: Authors' own work

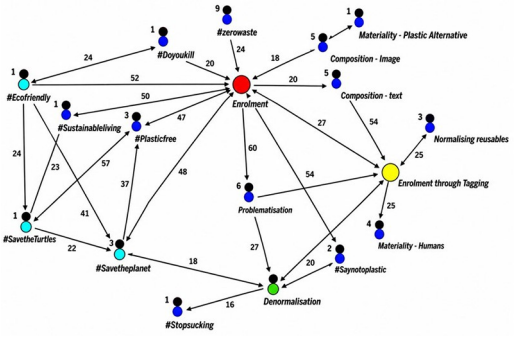

Figure 13. Enrolment map
Source: Authors' own work

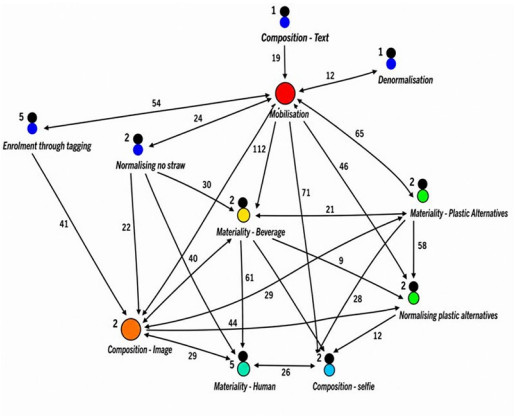

Figure 14. Mobilisation map
Source: Authors' own work

norms were not only being promoted but actively realised. Structuring of the data set through PoT made these practices observable as routine enactments rather than symbolic support

In summary, by operationalising PoT as a methodological device, this research made empirically visible the dynamic and staged nature of the agencement and its (re-)configuration within the #ditchthestraw campaign. The structured approach enabled the identification of distinct agencing activities across the four moments of translation, problematisation, interessement, enrolment and mobilisation, highlighting how actors and devices emerged and evolved roles throughout the campaign. This layered design not only traced the diffusion of market-shaping messages but also exposed how specific actors and devices worked strategically across stages to stabilise new market configurations and reframe consumption norms.

Discussion of findings

This study examined how the PoT (Callon, 1986) can be operationalised to trace the relational dynamics of market formation in digitally mediated environments. Organising digital trace data through the four moments of translation (see Table 3) enabled the analysis to follow how market concerns emerged, shifted and stabilised through reconfigurations of actors and devices. Consistent with a market studies perspective that understands markets as socio-material and continuously performed (Callon, 1998), translation unfolded through overlapping and recursive movements rather than a linear sequence.

Applying CMM enabled these dynamics to be traced empirically. Although the approach may resemble retrospective analysis, it does not involve reconstructing issues after they have stabilised. The CMM framework is applied iteratively, tracing how issues are articulated, contested and reshaped as they emerge across moments. The analysis remains focused on the unfolding and provisional nature of market dynamics, rather than treating them as fixed objects of interpretation. Organising posts through translation indicators showed how actors and devices entered, exited and reappeared in different roles. This revealed market formation not as discursive expression but as ongoing agencing work (Cochoy, 2014a), in which relations were negotiated and stabilised through distributed interactions. Particular attention was drawn to the role of digital devices in this process. Hashtags, tagging practices and circulating imagery functioned not simply as communicative symbols but as performative elements contributing to the evolving configuration of the agencement. Their roles shifted across problematisation, interessement, enrolment and mobilisation (Callon, 1986), reconfiguring market attachments and supporting calls to treat digital artefacts as actors in their own right (Lee *et al.*, 2024). Translation moments overlapped, with early framing continuing to shape later recruitment and enactment.

Table 3. Operationalising concerned market mapping as a transferable methodological framework

Stage	Focus	Guide	Issue mapping
Identify focal concern	Shared concern and obligatory passage point	Tracing how the issue framed and which actors, devices or discourses define the focal problem?	Initial mapping of key actors, devices, framings and discourses making visual the points of convergence
Trace problematisation	Construction of the problem	Tracing how harm or instability articulated and relations reframed?	Extend mapping to trace the emergence problem definitions and tensions
Trace interessement	Disruption and realignment	Follow efforts to weaken existing attachments and promote alternatives	Update mapping to reflect the shift in alignments and contested relations
Trace enrolment	Expansion of alignment	Follow recruitment, coordination, and mechanisms aligning actors and devices	Map the stabilisation of connections and the coordination across various actors and devices
Trace mobilisation	Enactment and diffusion	Trace how practices are stabilised and reproduced through behavioural or institutional uptake?	Refine maps to capture how practices spread and become patterned
Interpret translation	Reconfiguration	Trace how translation unfolds recursively and reshapes market formation?	Bring issue mappings together to make sense of the broader reconfiguration

Source(s): Authors' own work

Sequencing translation clarified how relational dynamics unfolded through everyday digital activity. Structuring data through PoT indicators revealed how devices and actors performed different forms of agencing across phases, stabilising the emerging configuration. Practices that might appear symbolic were instead enacted through repeated digital interactions (Callon, 2008), reinforcing the view that markets are assembled through distributed and iterative practices.

The case of #ditchthestraw illustrates these dynamics clearly. The changing role of the turtle image framed plastic straws as environmentally harmful within problematisation (Callon, 1986), helping establish the issue. As the campaign progressed, the same image reappeared within enrolment, functioning as a shared symbol through which participation was encouraged and coordinated. This repositioning demonstrates how devices reconfigured across moments, contributing to the stabilisation of the agencement. These patterns become visible when translation is traced processually.

Taken together, the findings indicate that operationalising the PoT enables the evolving configuration of market relations to be observed empirically. Market formation emerges not as a fixed outcome but as a dynamic process shaped through interactions among human and non-human actors (Callon, 1998; Cochoy, 2014b). By tracing translation across overlapping moments, the analysis provides an account of how market concerns become stabilised practices through ongoing agencing in digitally mediated contexts.

Additionally, these findings contribute to market studies by demonstrating how PoT can be operationalised as a methodological device for tracing digitally mediated market formation. While previous studies have drawn on PoT as an analytical framework, this paper shows how PoT's moments can be rendered empirically observable. This extends methodological approaches for exploring how markets are (re-)configured and stabilised through socio-material practices (Callon, 1998).

The first contribution, demonstrates how PoT can be operationalised, using its empirical indicators to identify moments of translation within large data sets. Through operationalising PoT through CMM, translation functions both as an analytical lens and as a device structuring data organisation, coding and sequencing. This approach responds to calls within market studies for methods capable of tracing relational market processes at scale without reducing them to static description (Roscoe and Loza, 2019) and aligns with recent efforts to treat digital artefacts as actors in their own right (Lee *et al.*, 2024).

The second contribution concerns methodological transferability. By abstracting from the empirical illustration of #ditchthestraw, the study outlines a processual framework through which CMM can be applied to other digitally mediated market contexts. The framework clarifies how researchers may identify focal concerns, trace successive moments of translation and map evolving socio-material configurations. In doing so, it contributes to ongoing methodological discussions about how to analyse scraped digital data while retaining sensitivity to socio-material specificity and interpretive depth (Mason, 2024).

These contributions advance understanding of how market formation can be examined in digitally mediated settings. By rendering translation empirically traceable and integrating relational mapping with processual sequencing, the study provides both a conceptual refinement and a practical methodological framework for analysing how markets are assembled, contested and stabilised through distributed digital practices.

Conclusion

This paper explored how the PoT (Callon, 1986) can be used as a methodological device to examine digitally mediated market formations. By translating PoT's four stages into observable indicators, PoT guided how digital trace data were organised and follow digital

trace data, making it possible to observe how translation unfolded across the empirical material. From this methodological grounding, CMM was developed as a means of examining how market concerns take shape through changing socio-material configurations. Bringing issue mapping together with the processual structure of PoT made visible how actors and devices shifted roles across overlapping moments of translation. The findings from a market studies perspective of market continuously being reconfigured (Callon, 1998) and show how digital devices such as hashtags, tagging practices and circulating imagery participate in the reconfiguring of market agencements over time. Centrally, this paper demonstrates how PoT can be used as a methodological tool to empirically trace how agencements emerge, evolve and stabilise across digital platforms.

Future research could integrate qualitative methods, such as interviews or ethnography, to deepen understanding of user motivations, attachment formation and resistance to behavioural change. Extending this methodology to other platforms, industries or forms of market activism would further test its applicability and reveal new modes of distributed agencing. Future work should refine methods for tracing real-time translations in data-rich settings, extending CMM beyond sustainable activism to wider questions of market transformation.

Note

[1.] An adjacency matrix is a square matrix used to represent a network, where rows and columns correspond to the same set of nodes. Each cell indicates whether a tie exists between two nodes.

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