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DOING INTERNET GOVERNANCE - STS-INFORMED PERSPECTIVES ON ORDERING THE NET

Joint Panel

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CONTINUOUS ORDERINGS AND ALGORITHMIC TRANSLATIONS: HOW STS OPENS UP AND RE-ASSEMBLES INTERNET GOVERNANCE

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This paper contributes to the recent move towards a more systematic reflection on the conceptual foundations of internet governance. Recently, scholars have begun to challenge the prevalent focus on internet governance institutions such as ICANN and IGF and opened up the question what constitutes internet governance in the first place. Perspectives rooted in Science and Technology Studies (STS) can inform this debate in various ways: they highlight the multi-sited and networked character of governance and ordering, the performative function of the debates themselves, the agency of the infrastructure and materialities involved etc (Musiani 2014). These stimuli from STS help to

overcome the institutionalist bias in internet governance and shed light on highly relevant phenomena contributing to ordering the net.

This paper builds on these debates that question and open-up conventional understandings of internet governance and addresses two key, interlinked questions within that debate: Firstly, as we detach the notion of internet governance from governing organizations, how are we to understand ordering and governing processes in the digital realm? In other words: What is it that we are talking about, when we talk about internet governance? Secondly, this raises the question how technologies (infrastructures, platforms, devices, algorithms) reflect and influence, mediate and translate these ordering processes. The paper contributes to this nascent discussion by mobilizing concepts from STS such as “ordering” (Law 1992, 1994; Flyverbom 2011) and “translations” (Callon 1986; Latour 1991) to address these key questions. The conceptual considerations are illustrated along the case of copyright regulation on video platforms like YouTube that apply content matching algorithms to detect copyright infringing material.

The first question relates to the understanding of internet governance itself. Traditionally, when talking about internet governance researchers and practitioners referred to the new organizations and institutions that had been established explicitly to regulate and discuss issues of internet governance, such as ICANN and IGF. Recently, authors have criticized this institutional focus in internet governance research. Instead, they highlight the continuous, heterogenous and multi-sited character of the activities and processes that contribute to the ordering of the net (Chenini 2009, DeNardis 2012, 2014, Eeten/Mueller 2013, Hofmann et al. 2014). This paper suggests to address these heterogenous process of internet governance with the concept of “ordering”. In contrast to regulatory and institutional perspectives in law, political science and economics, an STS-perspective does not primarily ask for decisions about (more or less) collectively binding rules, enforcement measures and the structure of transaction costs but instead interrogates the fabric of the social itself – as John Law (1994: 101) famously put it: „There is no social order. Rather, there are endless attempts at ordering.“ Michael Flyverbom (2011) has already used this notion of ordering – instead of regulation or control – to highlight the mundane activities that constitute internet governance: the „practices, interactions and assemblages at play in the socio-political space under scrutiny - the work, techniques and interactions through which the global information society was made governable.“ (Flyverbom 2010: 426) But these practices not only take place around the United Nations bodies so instructively studied by Flyverbom, instead they continuously happen by ways of economic and technological developments driven by platform providers (Gillespie 2010, DeNardis 2012), decisions and rulings about the internet infrastructure (DeNardis 2012), the interconnection agreement between network providers (Meier-Hahn 2015), the day-to-day handling and regulation of user-generated-content on platforms such as Facebook, YouTube and Twitter. The concept of ordering thus opens up ways to investigate these diverse practices as internet governance, as they are not seen as mere objects of regulation, but as elements constitutive to articulating, reifying and questioning established, emerging or contested norms. The continuously emerging and dissolving order is, in this view, an “effect generated by heterogeneous means“ (Law 1992: 382).

The second part of the paper addresses the relationship between these heterogeneous means of ordering. A core theme in current debates on internet governance relates to the role of technology (infrastructures, platforms, devices, algorithms) in ordering the net. Lessig (1999) had highlighted this dimension early-on with his catch-phrase “code is law”, recent contributions emphasize the “politics of platforms” (Gillespie 2010, Langlois 2013, Hands 2013) and the materialization of political conflicts within the internet’s architecture and infrastructure (DeNardis 2012). This paper contributes to this debate by mobilizing the STS concept of “translation” (Callon 1986). This notion – that Latour (1991) explained illustratively with his hotel key narrative – accounts for the (sometimes tiny) shifts that occur when norms and practices circulate across people, things, and contexts. By translating ‘leave your key at the front desk’ from an oral appeal to a heavy object attached to the hotel key, the hotel manager not only enrolls a more powerful functional equivalent, instead the whole arrangement is displaced. For studying the growing salience of political conflicts mediated through digital technologies (DeNardis 2012) this proves an instructive perspective. For example, content regulation on online platforms is increasingly enacted by algorithmic filtering systems that scan uploaded texts, videos and audio material for possible copyright infringements and user rights violations. Systems like YouTube’s ContentID matching algorithm translate legal copyright norms into computable pattern recognition, assuming every match to be a copyright infringement at first. The algorithmic translation of copyright thus comes with a displacement of the frameworks that govern the circulation of cultural works. These new arrangements consider infringement as the default and contribute to the growing privatization of internet governance. By providing this algorithmic system in combination with a license clearing mechanism, YouTube becomes a key arbiter of copyright regulation worldwide (Dobusch 2014). Thus, the concept of translation proves a useful concept for investigating the role of technology in handling governance conflicts: algorithms and infrastructures not only mediate or enforce legally or socially articulated norms, but they translate these into something different, something computable, instigate different dynamics, and contribute in this manner to re-assembling the social (Latour 2007) – and as it is here: internet governance.

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PRACTICES, PLURALITY, PERFORMATIVITY AND PLUMBING: STS APPROACHES MEET INTERNET GOVERNANCE RESEARCH

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Recent scholarship provides the opportunity for an assessment of the underexplored, but promising, marriage between science and technology studies (STS) and Internet governance (IG) research. This paper¹ seeks to discuss the ways in which STS scholars' approaches to IG bring to the fore a number of aspects that political and legal sciences – the disciplines that have so far mostly shaped the field – have addressed only incompletely so far, but are crucial to understand today's governance of the Internet as a complex sociotechnical system of systems. These aspects include the day-to-day, mundane practices that constitute IG alongside global fora and transnational political initiatives; the plurality and "networkedness" of hybrid devices and arrangements that populate, shape, and define IG processes; the performative function of these arrangements vis-à-vis the virtual, yet very material, worlds they seek to regulate; the invisibility, pervasiveness, and agency of infrastructure.

The paper first addresses the debate on the "boundaries" of the Internet governance field. While the research that explores it is certainly "in the making" (Latour, 1987), the very definition of IG is contested by differing groups across political and ideological lines. Among the most accepted definitions is the one authored by the United Nations-promoted Working Group on Internet Governance (WGIG, 2005), broad enough to reach wide consensus, but has nonetheless been criticized for its limited usefulness in drawing the boundaries of the field (Malcolm, 2008). The consequence of this definition is that scholars seeking to elaborate a theory of Internet governance have always been heavily informed by assumptions about the nature of the social forces and agencies underpinning the IG phenomenon (Cheniti, 2009). STS scholars tackle this issue by suggesting, in essence, that not only is it not necessary to provide one precise definition and perimeter of IG, but that the assumptions derived from this operation may go to the detriment of apprehending how the practice of Internet governance is enacted, in pervasive, networked and often invisible ways (Ziewitz & Pentzold, 2013).

Secondly, the paper shows how, trying to bring together a young discipline of disciplines and an emerging field of study, STS scholars of Internet governance have a common interest in the epistemological, methodological and lexical implications of their work. Indeed, STS provides a vocabulary and a toolbox, both of which confront and dialogue with vocabularies and tools of political and legal sciences on one hand, engineering sciences on the other. 'Classic' STS concepts and references such as Geoffrey Bowker

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and Susan Leigh Star's work on standards (1996), Bruno Latour's technical mediation (1994), Michel Callon's sociology of translation (1986), as well as Tarleton Gillespie's more recent research on the "politics of platforms" (2010) are mobilized and updated in order to bring to the fore the "power and politics" qualities of technical architectures, the uses of Internet governance technologies as "hidden levers for content control", and the privatization of IG (DeNardis, 2012).

The paper then examines how the very concepts related to governance, of the Internet and beyond, that have interrogated political science in the past few years – like the cumbersome multi-stakeholderism – are being revisited in light of STS-born concepts like socio-technical assemblages and hybrid forums, defined by Callon et al. as "political institutions [...] expanded and improved to manage [...] controversies, to transform them into productive conversations, and to bring about 'technical democracy' [...] in which experts, non-experts, ordinary citizens, and politicians come together" (Callon et al., 2009). Understanding multi-stakeholder arrangements as hybrid forums helps to shed light on how these arrangements enact a relational conception of authority, one based on networking and "facilitation of linkages between social worlds" as a form of power (Flyverbom, 2011). The debate on multi-stakeholderism in IG is also bound to be revisited because of the increasing privatization of IG (DeNardis, 2014; Brousseau et al., 2012). If the role of the private sector is more and more important in Internet governance arrangements, the technology-embedded nature of their intervention - how they "hold stakes" in the Internet and act accordingly - can be placed at the foreground by STS methods.

Finally, the paper addresses another common thread in STS-informed approaches to Internet governance: the examination of the structuring and performative effects that controversies and negotiations have on governance. To put it in the words of Ziewitz and Pentzold (2010), STS IG-related contributions present different versions of the worlds in which notions of governance take place. Thus, for the analyst, the negotiations and controversies that take place around claims of "Internet governanc-ing" (Cheniti, 2009b) can be viewed as performative, inasmuch as they "both implicate and are implicated in creating the worlds in which a mode of governance makes sense" (Ziewitz & Pentzold, 2010: 20). In IG, the very processes by which norms evolve - are put to the test, made the subject of conflict and realignment, destabilization and re-stabilization - becomes central, as they provide different types of guarantees to the various stakeholders.

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DUALITY SQUARED: ENHANCING THEORITIZATION OF INTERNET GOVERNANCE WITH SCIENCE AND TECHNOLOGY STUDIES

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There is a growing interest in the study of Internet governance, but the demarcation of this field or even the use of the term “Internet governance” in scholarship remain ambiguous and contested. In her 2012 preliminary analysis of self-identified Internet governance scholarship, Laura DeNardis, showed that 42% of publications focused on either “nation state in Internet governance” or “assessments of WSIS/IGF processes” (DeNardis, 2010, pp. 3–5). Similarly, van Eeten and Mueller (2013) describe the current state of scholarly literature as focused “almost exclusively on international institutions involved in explicit discussions of the global governance of the Internet” (p. 721). These authors make an argument for the study of private institutions involved in Internet governance through steering of the day-to-day business arrangements running the Internet infrastructure. The goal of this paper is to extend this conceptualization of Internet governance further, to include other decision-making activities and practices with constitutive effect that shape the Internet. I put forward a proposal for the “duality squared” model of Internet governance that brings together the notions of agency (of policymakers, technology designers, and technology users), social systems (as a reference to values in policy and design), and social structures within which practices and decisions evolve.

Building on Braman’s (2009) definition of governance as “decision-making with constitutive [structural] effect whether it takes place within the public or private sectors, and formally or informally” (p. 3), I claim that governance of the Internet extends beyond formal policymaking by either public or private actors and involves decisions made not only about the physical layer (borrowing from Benkler, 2006). Internet governance involves “decision-making with constitutive effect” that occurs also at the logical and the content layers and, in addition to policymakers, involves both technology designers and users of those technologies. Literature dealing with questions of Internet governance, however, rarely brings these various actors together. This is where lies the promise of contribution of science and technology studies (STS).

STS offer an invaluable conceptual toolset for explaining the constitutive effects of interactions among policymakers, technology designers, and technology users, and between those actors and the outcomes of their activity, being it policy, technology or practice. There is a growing number of STS-informed research on Internet governance that provides insights in the mundane practices around the management of Internet infrastructure (DeNardis, 2009), content monitoring (Mueller, Kuehn, & Santoso, 2012), or practices of Internet-related policy deliberation (Epstein, 2013; Flyverbom, 2011). Yet there are few to none attempts to provide a unified conceptual network for the ‘expansive’ notion of Internet governance. In fact, since Lessig’s “Pathetic Dot” theory (2006), there was little conceptual innovation in constructivist understanding of how governance, design, and adoption of the Internet and web-based technologies mutually shape each other.

This piece puts forward a proposal for a structuration-theory-based framework to analyze the interaction between information technology artifacts, their users, designers, and policymakers regulating information governance, as well as policy “artifacts” they

create (as in regulations and regulatory institutional settings). This framework is inspired by Giddens' (1984) Theory of Structuration and the work done by Orlikowski around technology adoption in organizations (Orlikowski, 1992, 2000). Compared to approaches such as social construction of technology (Oudshoorn & Pinch, 2007; Pinch, 1996; Pinch & Bijker, 1987) and actor-network theory (Callon & Latour, 1992; Callon, Law, & Latour, 1986; Pinch, 2006), structuration has had limited application in the social studies of technology. However, the attempts that were undertaken produced useful insights that allow building on the strengths of the "mainstream" approaches, while bridging the conceptual dualism regarding agency and structure.

The proposed model revolves around the notion of duality of social structures and human agency. Orlikowski (1992), and then DeSanctis and Poole (1994), have established the notion of duality of technology, which has since been widely employed in the study of technology use and adoption. Building on that work I develop the notion of "duality of policy" as a systemic "artifact" that embodies explicit negation of structures of signification, legitimation, and domination. I then integrate the notions of duality of information and duality of policy in a single model (thus "duality squared"). The resulting model views technology development, use, and regulation as occurring within the context of, and thus both challenging and reifying, existing social structures and systems (technology and policy). I will discuss potential applications of this model for unpacking notions such as multistakeholderism in Internet governance.

Conceptually, this proposal is motivated by my interest in the inherent tension between individual agency and micro-behaviors of individuals on the web, and the systemic and structural properties of the environments where information technologies are being created, regulated, and used. Practically, this work is fueled by the ongoing discussions about Internet governance and the growing body of literature on this topic, with particular emphasis on attempts to bring in conceptual contributions from STS. Technologies and policies governing how information can be created, used, shared, remixed, abused, etc. make a particularly interesting case for the analysis of the agency-structure tension both because of the ubiquitous presence of such technologies and policies in contemporary society and because of their fundamental importance for the notion of power in social analysis.

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LGBT RIGHTS CONFLICTS WITHIN INTERNET ARCHITECTURE AND GOVERNANCE

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Political conflicts are increasingly mediated by Internet infrastructure and governance rather than materializing at the level of content (DeNardis, 2012). Politically motivated distributed denial of service attacks (DDoS) have enabled governments to silence human rights organizations (Zuckerman et al., 2010). Private financial companies severed the flow of donations to WikiLeaks after it released U.S. diplomatic cables (Benkler, 2011). The Egyptian and Syrian governments disrupted Internet and phone service during political turmoil (Roberts et al., 2011). This phenomenon of infrastructure-embedded political conflict makes digital control points visible and illustrates the power of Internet governance levers in either restricting or expanding the public sphere.

Online political expression about LGBT (lesbian, gay, bisexual, transgender) issues has historically materialized at the level of content. Hundreds of thousands have participated in Dan Savage's "It Gets Better Campaign" to digitally speak out against bullying and give hope to LGBT youth (It Gets Better Project, 2013). Equality campaign "All Out" (2013) posted a video prior to the 2014 Russian Olympics depicting a lesbian figure skater winning the Olympics and breaking Russian law by publicly kissing her partner.

But conflicts over LGBT rights, similar to other social conflicts, are also increasingly mediated by systems of Internet architecture and governance. For example, members of Egypt's LGBT community have raised concerns that government authorities use the gay dating app Grindr to track down gay men (Tanriverdi, 2014). Activists hacked the Facebook fan page of Ridgedale Church after it expelled a family supportive of its lesbian daughter's appeal for domestic partner benefits. Private information intermediaries such as Yelp routinely make policy decisions regarding what LGBT-related comments to delete from its pages. Scholarship around LGBT rights issues has not yet caught up to this phenomenon, instead primarily focusing on critical issues of usability and online behavior, identity politics online, and LGBT cyberbullying.

This paper fills a gap in scholarship and policy by examining the rising phenomenon of infrastructure-based LGBT rights mediation. It employs an existing six-layer typology of Internet governance by DeNardis and Raymond (2013) as a conceptual framework for locating and analyzing empirical cases studies that could help establish how LGBT conflicts are mediated at various levels of Internet governance and what it might mean for the future of LGBT rights. These layers include: control of critical Internet resources such as Internet names and numbers; setting Internet standards; access and

interconnection coordination; cybersecurity governance; private information intermediation; and architecture-based intellectual property rights enforcement. The underlying research question examines whether LGBT rights conflicts embed within all six layers, even the most hidden and technical areas of coordination. The research findings locate cases, multiple cases, at all six layers of Internet infrastructure governance:

Case 1. The Domain Name System as Battlefield over a .Gay Top-Level Domain – The first case study examines contention over the approval of the proposed .gay top-level domain (TLD) by the Internet Corporation for Assigned Names and Numbers (ICANN). For example, countries like Saudi Arabia objected to the application arguing that a .gay TLD would violate moral values.

Case 2. Politics of Standards: Gamertags Restraining LGBT Expression – The second case examines restrictions on gay-related gamertags on multiplayer gaming platforms like Xbox. Technical standards, whether open specifications established by institutions such as the Internet Engineering Task Force (IETF), or more proprietary specifications used within a technology company's platform, involve technical design choices that both enable and constrain behavior online. The technical specifications (rules) within Microsoft's multiplayer platform Xbox Live excluded LGBT-identifying gamers through restrictive gamertag user names.

Case 3. Governments and Private Entities Controlling Access to LGBT-related Content – The third case analysis examines the use of access and interconnection control points by the Russian government to diminish LGBT visibility online, as well as private technology companies blocking access to LGBT-related information.

Case 4. Cybersecurity and Conflicts over LGBT Rights – The fourth case examines the hacking of an anti-gay church's website to make the organization an involuntary advocate for LGBT rights and a case of a hacker associated with the global network Anonymous targeting the Nigerian government's website over the country's anti-LGBT stance.

Case 5. LGBT Conflicts Mediated through Private Information Intermediaries - Private intermediaries assume an increasingly important role in mediating civil liberties like privacy and free expression (Balkin, 2009). For example, Facebook came under attack for terminating the user accounts of drag queens and other members of the LGBT community over their violation of real name policies. Legendary drag queen Sister Roma and other members of the LGBT community played a central role in challenging Facebook to relax its policy (Holpuch, 2014).

Case 6. Architecture-based Intellectual Property Rights Enforcement and LGBT Rights – The final case area examines a conflict resolving whether the satirical website chickfilafoundation.com constituted a violation of Chick-fil-A's trademark. The World Intellectual Property Organization (WIPO) was at the center of a dispute over the website chickfilafoundation.com that parodied Chick-fil-A's traditional family values and its stance against marriage equality. Considering the website as "confusingly similar" to the Chick-fil-A name and design, representatives of the fast food chain filed a trademark

violation complaint. While WIPO (2012) found the website to be “confusingly similar” to the Chick-fil-A trademark, it rejected the complaint as the site had not been created in “bad faith” or for commercial purposes.

The paper explains the applicability of the six-layer typology for analyzing the various layers of Internet infrastructure governance, develops the six case areas in which each of these layers directly mediates LGBT rights conflicts, and presents a future agenda for research into this nascent phenomenon. It concludes with a discussion of the implications of infrastructure-based rights mediation for the techniques of LGBT rights activists and identifies several open debates over the future of Internet governance that could have implications for the future of LGBT expression and identity formation in the online public sphere.

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The Cloud as a Modular Infrastructure: Implications for Governance

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From the perspective of policy analysis, cloud computing presents itself as an object with particularly problematic boundaries. Depending on one's mood and perspective, cloud computing can be variously characterized as: (a) the realization of computing's promise as *utility*, the freedom to access processing power and storage as instantaneously and flexibility as electricity, water and gas (Armbrust et al. 2010); (b) a new era in the *economics* of computing, allowing providers to price computation at an unprecedented granular level, transforming fixed capital investments into operational expenses, and lowering barriers to entry for computing innovation (Weinman 2012); (c) a return to the mainframe era and its model of *centralized control* of resources (Lanier 2010); (d) the development of a new industrial form, the *data center*, devoted to the efficient transformation of electrical power into flows of bits (Barroso and Hölzle 2009); (e) the computing architecture appropriate to the era of *Big Data/Big Brother*, dramatically increasing the capabilities of governments, businesses, and scientists for surveillance, targeted advertising, and research (Mosco 2014; Clarke et al. 2013); (f) the elevation of *access to broadband* as a key economic issue for governments all over the world, as well as the defining material line between the digital haves and have-nots (FCC 2010); (g) another illustration of the power of *modular design*, whereas the enormous processing and storage capacity of data centers is based on the interfacing of thousands and thousands of small-bore individual servers and disk drives (Barroso and Hölzle 2009).

In this paper, I propose instead that the Cloud is shorthand for the moment where computing has become, both materially and symbolically, *infrastructure*, that is, a socio-technical system that has become ubiquitous, essential, and foundational (Edwards 2002, 187). As infrastructure then, the Cloud necessarily becomes the focus of a series of policy concerns that deal with issues of market regulation, fairness, universal access, reliability, criticality, national security, sharing of limited resources, congestion, inter-network competition, national economic welfare, capacity planning, monopoly, antitrust, etc.

These issues and the debates are familiar: they have, in one form or another, featured in every type of energy, transportation, and communication network deployed before. Yet the Cloud is distinctive for its ubiquity: if energy, transportation, and information infrastructures tend to be tightly intertwined, the Cloud's capacity for real-time measurement and statistical analysis of supply and demand is making it integral to the functioning of a large number of other infrastructures, including energy (smart grids), financial services, airports, the upcoming driverless cars, and even the Cloud itself. The Cloud has become, in effect, a certain kind of *meta-infrastructure* (while of course remaining itself entirely dependent on the electrical grid). Governance and regulation of the Cloud thus pose exceptional challenges, with far reaching impact.

The study of the development, evolution, and governance of the large technical systems that invisibly power the social world has long been a focus of STS scholars, including Hughes (1983), Star and Ruhleder (1996), and Latour (1993). Leveraging the work of Jackson (2007), Bowker (2010), Sandvig (2013) on the dynamics of information infrastructure, I show that like the networks that preceded it, the Cloud develops, operates, and breaks down following specific infrastructural dynamics. It has, for example, developed incrementally, from the progressive laying down of its infrastructural components, including data centers, fiber cables, economic models, regulatory frameworks, etc. The ability to develop incrementally through interconnection and layering of functional components has however been adopted as a core design technique of computing systems. Indeed, scholars such as Lessig (2002), Zittrain (2008), and Wu (2010) have elevated modularity and layering to a quasi-religious principle, arguing that the innovative character of the Internet is a direct outcome of its modular design structure and the kind of markets this structure supports.

In this paper, I tease out the implications for governance of the historical development of modular systems. I illustrate that the very structure of modular architectures implies that early-stage design choices *persist*, often with unforeseen consequences, and become increasingly difficult to correct as the infrastructure become ubiquitous, its functionality expands, and the nature of the traffic it services evolves (e.g., the Suezmax standard for shipping, the maximum size of IP addresses specified by IPv4, and best-effort service in the context of the dramatic expansion of streaming video traffic). The Cloud is then not so much layered, as it is sedimented, and its many strata provide us with a rich socio-technical history of the evolution of modular relations, the negotiation of design trade-offs, and the technical dramas that accompany the integration of new computational resources within the computing stacks. The history of these evolutionary processes that hark back to the early beginning of computing is essential to understanding current policy debates, insofar as they illustrate the constraints on Cloud's future evolution.

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