Towards a Bill of Online Rights

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Abstract: Socio-technical systems like Wikipedia, Facebook and YouTube are social systems operating on technological base, and so are subject to social and technical requirements. Human rights such as freedom and privacy have evolved over thousands of years of physical world experience; online communities are now revisiting basic social ideas for many different and new online activities. As programmers and designers try to satisfy social needs by technical means, Berners-Lee argues that a universal bill of online rights is needed to protect people from social abuse on the World Wide Web (Kiss, 2014), and we agree. Since the web is a socio-technical system, it is self-evident that it cannot succeed in the long term without social as well as technical standards. A bill of online rights would highlight critical social principles that would drive the design and development of the World Wide Web as a social success, e.g. by supporting the social trust necessary for online trade. This paper aims to begin the process of developing a framework of online rights based on both our past social history and our current technical expertise. A conversation about social standards online needs to begin, for just as people need order in physical communities, so order is needed in online communities.

Keywords: Cyberspace, Online Rights, Online Standards, Rights Management, Socio-technical design

1 Introduction

Socio-technical systems (STS) are information technologies that mediate online social interactions like YouTube and Facebook (Wan, 2017) where millions of people share billions of resources. Online communities are not physical, but as they are essentially still people interacting with people (Jahnke, 2009) they need the same social structures. Just as physical society has privacy, control over one's personal information (Fried, 1968), people in online societies want privacy settings for videos, pictures and posts. However, despite the current comprehensive privacy support, privacy concerns are today stronger than ever (Suntaxi-Oña, 2015). For example, Bob – a friend of Alice can tag her on a photo, and display it to her social circle without her consent, which causes several social problems (Hu, 2014).

Similarly, STS developers, at times, make social interaction difficult for users by not providing the necessary social options; however, the rise and fall of online systems can be attributed to the social freedom they provide to their users (O'Reilly,

2011). For example, a documented reason for the failure of Orkut, the most popular social network of 2007, was the lack of choices it provided to its users, where one cannot even control the display of their posts (Debbarma, 2016). Accountability, another social concept, is equally important which refers to answerability (Broadbent, 2003). Many current systems provide weak accountability mechanisms and thus users face various scams and online frauds (Baraniuk, 2017).

The above highlighted issues are just some of the problems faced by current STS users (Hu, 2014; Debbarma, 2016; Baraniuk, 2017), since formalizing social ideas into code is hard. So often STS developers just make their own ad hoc rules, such as Alice cannot 'friend' Bob unless he also 'friends' her, even though in the physical world one can love another and not be loved in return. Friendship is a discretionary act that is given not the trade of a social token. If friendship is about giving someone access to your data, one can friend another without asking them to return the favour.

When online rights are based on technical simplicity rather than well-define set of social standards, they vary between applications and over time, and mistakes are often only recognized by a public outrage and the ensuing public relations disaster (Newman, 2010). Since no universal standards exist for online social rights, as Bellovin (2015) says:

"*we are doing it like downstream warning based on what just happened upstream. What we really need is a stronger dam; better yet, we need to prevent the floods in the first place*".

Social rules can reduce conflicts over digital objects as they do over physical objects. The need is to define social requirements that can be translated into technical specifications, because at stake is the value of everything we do online (Shah, 2011). Hence the inventor of World Wide Web, Sir Tim Berners-Lee, calls for the bill of online rights to protect the "open, neutral" system that is currently giving so much value (Kiss, 2014). This paper supports this view, and adds that the place to look for answers is our social history. The rights that humanity has evolved over thousands of years are in fact a high level social language (Ridley, 2010), which socio-technical designers must decode for programmers to re-encode in the applications and services that are our new social context.

2 Socio-technical design

In 1950's, the Tavistock Institute introduced the term socio-technical as an alternative to Taylor's attempt to reduce workers to cogs in the factory machine (Porra, 2007). The human factors movement then morphed into a push for the ethical use of technology, and its credo that "*just because one can does not mean one should*" also applies to technology design today. Yet while computing research has long recognized human factors like usability and ease of use in design (Hu, 1999), it is still coming to terms with the idea that the new "user" is the online community itself.

Just as software problems like infinite loops remain as hardware problems are solved, and user problems like usability remain as software problems are solved, so social problems like lack of trust still remain even if all hardware, software and interface issues are addressed, so it demands more performance from the system while adapting to a higher level. Simple user requirements like ease of use are not the answer to social problems like trust. Developing a socio-technical system requires not

only solving hardware, software and interface requirements, but also constraints coming from social policies and regulations (Scacchi, 2004). STS designers face challenges beyond those of human-computer interaction (HCI), because communities emerge when people interact, where a community is a set of people who see themselves as one. As argued elsewhere, the hardware, software, HCI and STS levels of computing design reflect the emergent system levels of science, namely physical, informational, psychological and social (Figure 1).

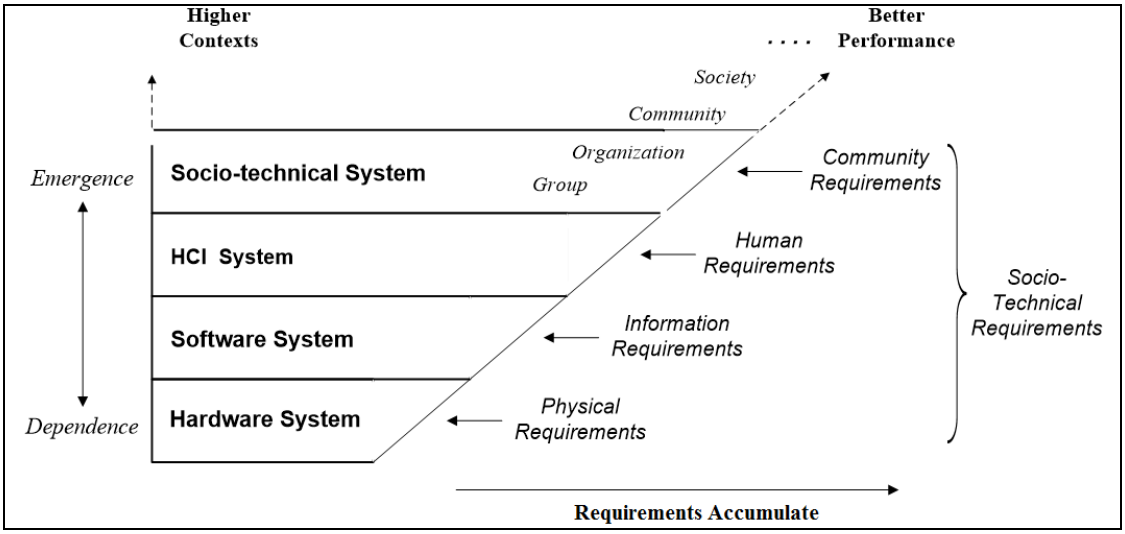

Figure 1: Socio-technical requirements cumulate [Whitworth, 2009]

3 Socio-technical principles and standards

In the rush of technical advance, it is often forgotten that in the past it has needed a matching social advance, e.g. without the road code, the social invention of rules for road users, the car would not be much use. Social inventions like credit or taxation are less obvious than technical inventions like rockets and cars, but just as important, e.g. driving cars requires standardized left or right-hand norms. Social systems, whether mediated technically or physically require socially acceptable social standards, by law or code, to succeed. The online problems raised in the previous section suggest the following social principles for a bill of online rights. They are not exhaustive but in history laws never are, but must be continually updated according to circumstance. One thing however is clear – that some social principles are better than none.

3.1 Social principles

Communities, by laws, norms and rules, give people rights – social permissions to act (Vasak, 1977)[1]. They do not automate interactions as by definition they are choices not compulsions. The right to delete a file does not make one delete it, any more than the right to sue forces one to sue. Rights are what one can do online, not what one must do. The aim is to provide legitimate rights, defined as both fair and in the public good, in a way that can be technically applied.

1) Accountability

Accountability refers to the relationship of "giving and demanding of reasons for conduct" (Broadbent, 2003). This includes answerability and responsibility for one's actions (Dykstra, 1939). It applies when the actions of one person in the community harms another. Some argue that accountability is an intrinsic part of human nature (Littleton, 1966) and most agree it is fundamental to ethical standards in any society (Beu, 2001). Accountability also applies when a steward is accountable to another who entrusts rights or resources to him, whether the latter is a superior steward, the owner or the community (Shah, 2011). In its universal form, it applies to all human beings in almost every social setting. For example, Bird (1973) found that even in Babylon society, around 1650 BC, accountability principles were central to their laws. Accountability asks questions such as: Who is accountable? To whom? and For what? (Bovens, 2014).

Research into online accountability has gained increasing attention in the last decade (GCIG, 2017). In the internet environment, accountability is an evolution that addresses common problems that arise when people behave mischievously online [Eggenschwiler, 2017]. When accountability fails, people face online scams and frauds ranging from click baits to phishing. Creating accountability mechanisms costs time, effort and money but is necessary to create trust over online transactions [Baraniuk, 2017]. Some argue that perfect accountability requires centralized control which the internet does not have, but physical world democracies apply accountability just as well as dictatorships. The key to accountability is for the system to take meaningful actions, e.g. YouTube's zero-tolerance policy towards offensive content that deletes the owner's account, resulting in account holder's loss of current and potential revenue, is reflected in a relative absence of such content over YouTube. On the other hand, click baits are not considered as severe thus a huge number of such videos are available, continuously misleading/victimizing the users. Just criticizing the current situation over disintegrating internet has little effect but proposing some workable solution may improve the situation or at least initiate a debate about improving it.

According to the agency theory (Shah, 2011), people feel accountable for their actions because they have to justify their conduct to others. In contrast, a computer program has no self-image it needs to maintain and so cannot be held accountable. However for an online persona/avatar agency theory does apply. In this paper, rights are allocated to people who act online via digital personas upon which the technology acts, and the actions performed on the technology must refer back to the actor

[1] There are different types of rights such as civil, political, economic, social and liberal etc., however, this distinction and their discussion is out of the scope of this article.

performing them. The situation is as when a person drives a car: the law holds the driver accountable for a crash not the car, but the car can still be impounded. Likewise, if a persona breaks a social rule online, the person owning it is accountable, and must face the consequences, as when a banned EBay seller name loses online credibility or a deleted YouTuber loses potential revenue. This requires technology to have no rights of itself but pass all rights to accountable parties.

Accountability principle**:** *All online permissions must be allocated to accountable actor personas at all times.*

2) Freedom

Accountability requires the possession of the self (Shah, 2011), which affects the reflexivity of a person in social life. This is because, all members of a community expect behavior from others that reflects that of their own self (Mead, 1934). Freedom, the ability to *choose* from a set of available options, also presumes a self. While the debate about the clockwork universe goes on, most people see the self as choosing in a way that is not mechanical. Indeed, without freedom of choice accountability makes no sense, as how can one be accountable for "choices" one was forced to make? If an online persona is sending messages, making posts or requesting friend unknown to its owner (Facebook help, 2015), that person has no online freedom.

Given this approach, the role of a socio-technical system is to provide options not to make the choice itself. For example, people often want lists of new events sorted so if that cannot be done it is an obvious information level deficiency. Similarly at the social level, which is about communication links, one might want to secretly notify a friend about an event in a particular post, and if the only option is to announce to everyone that is another deficiency. Dryer (1964) argues that what prevents a person carrying out some act impairs their freedom be reducing their choices. This is not slavery, taking direct control of another's choice, but it is equally anti-freedom.

Orkut, a once famous social network, was shut down in 2014 and a known reason was how few choices it provided its users (Debbarma, 2016). Every conversation between two parties on Orkut was public for all the other users as well. This lack of choice was addressed by Facebook where one can decide the visibility of each post from entirely public to entirely private (yet one still cannot transfer objects to others). Similarly, online forums that don't allow editing posts after posting also restrict choice. When applications on smartphones ask for more permissions than they need to do their job, they also reduce their owner's freedom. Such demands make people wonder if they want to install the application at all (Shehab, 2012). The same is true for some online systems that demand unlimited access to your data to get their services.

Online freedom gives one the right to read, edit, update and delete the persona that represents you online, yet many systems do not allow people to delete their profile in order to keep their user numbers high (Louis, 2013). As often cited democracies out-produce autocracies because free people produce more, and online is no different (Beer, 2007). The success of Wikipedia and YouTube derives directly from the freedoms they offer.

If the norms of an online community are well defined and announced in advance, every individual can choose to follow or not. If not, the community can ban him/her

on the breach. Also, online forum super-user moderators, acting like super users, having all the rights and not passing on to the community, i.e., make their choice set null, restricted their growth compared to Facebook where no such 'super user' exists, giving everybody the same level of freedom.

Freedom principle: *No technical system shall enslave (take control of) any online persona, but rather maximize its choice set, unless banishment makes it null.*

3) Privacy

In his legendary work, Fried (1968) argued that privacy as control over information can be seen as an aspect of freedom that allows control of one's data. Privacy, as the right to control the display of one's personal data, is about ownership of self-data, not secrecy, and so includes the right to make personal data public (Geer, 2015). It is generally accepted that privacy depends on the type of data, e.g. one may easily discuss a vacation trip but not be comfortable discussing financial affairs. Fried has also suggested that privacy is also about the level of detail one wants to disclose (Fried, 1968), e.g. one may not mind if casual acquaintances know about his/her illness in general, but may be uncomfortable about revealing nature, details, or symptoms. A desire for privacy does not mean that someone has something to hide. Just as the tax law makes in not illegal to arrange one's financial affairs to minimize taxes (Bonahoom, 1953), likewise it is not wrong to arrange one's affairs as to minimize public display (Geer, 2015).

Online cookies are commonly used by web servers to ensure the authentication and authorization of users across multiple pages, sections and sessions (Tappenden, 2014). Some cookies track user activities on a particular website while others track it across multiple websites. They were invented to provide a better browsing experience but ended up impacting people's privacy and recording online behaviors (Kristol, 2001). Cookies are not inherently bad, but cookies that are stored on users' machines without their consent, in encrypted form, and shared with third parties (ICO, 2017) raise legitimate privacy concerns in people's minds. To resolve such issues, the Privacy and Electronic Communications Regulations (EC Directive, 2003) suggest that the user consent must be given in advance to store of cookies on their machines, and their content and usage should be transparent.

The desire for privacy is not about ethics but about social success. If a party cannot control what, how and to whom its private data is revealed, it cannot survive as a social unit. System files are kept private to protect the operating system from harm, and in the same way social parties need to protect personal data, knowing that any loss is irreversible as information disclosed can never be "unrevealed" (Geer, 2015).

Privacy principle**:** *No technical system shall act upon the data of any persona, to edit, move, display or delete, without the express permission its accountable owner.*

4) Ownership

Ownership is the social recognition that a social party is responsible for the owned object and for any effects on others caused by its use. Since recognition of ownership implies accountability, only a self can own an online object, unless someone wishes to make the case that an online program is accountable.

A private owner can *lend* the object for use to someone else, or make someone else her *agent*[2], or *sell* the object to someone else who then gets the same rights she had previously. The only restriction on object use is whether other people are affected by her/his decisions (Waldron, 2016). There are other variations on the ownership right and on the freedom to exercise it, like ownership of historical buildings, the use of an aero plane, and landlords who owes nothing on their property, but they are outside the scope of the current discussion. Some generalized rules about the ownership right are that: a) the owner of an object can use it as (s)he likes, within an acceptable social usage range; b) others may need her/his permission to use the object and must refrain from using it without permission; c) (s)he has the authority to grant the right to use of the object to others (Fehr, 2008), following the traditional principal/agent model, which states that anyone who is in possession of a resource that belongs to someone else acts as an agent for them (Bird, 1973). Yet current socio-technical systems rarely allow people transfer or delegate the ownership of objects they own, even when desired (Ahmad, 2017).

Just as recognition of ownership increase social value in physical communities, so it increases value online. Online data is no longer "just information" when Paypal and Bitcoin represent billions of dollars of real resources. Who owns what online is as important in the online world as it was in the physical world. Indeed privacy can be seen as the inalienable right of any person to own themselves, given Locke's idea that one owns the fruits of ones labors, initially at least. Again ownership links intimately to other social concepts, as how can one be accountable for something that one does not fully control?

O***wnership principle:*** *No technology shall act upon on online object without its owner's permission.*

5) <u>Collective action</u>

Waldron (2016) describes three property ownership types:

a) *Common*: Governed by governments for the common good, e.g., streets and parks.
b) *Collective:* Community decides what to do with important resources, e.g., military bases.
c) *Private*: Control by the person who owns/controls an object, e.g., vehicles and houses.

Social interaction becomes complex when people interact with each other collectively, e.g. by joint ownership. Online voting is an example of many people working together to make a collective decision. Such activities require the application of new joint ownership policies, for objects that do not solely belong to one party, and recent research efforts recognize joint privacy models (Ilia, 2017).

Supporting multiple ownership of objects that can be sold, delegated or shared is complex, but a community that allows this becomes more productive (Waldron, 2016), so the same should apply to online communities. Like experimented and proved in (Fehr, 2008), joint ownership model is sometimes the most efficient model to operate on. A lot of discussion about privacy of online private data has been done in the form of granting access only to authorized users (Carminati, 2009); however,

[2] After the receiving party's consent.

little consideration has been given to collective and common data. Some collective ownership models have been proposed in recent years (including Hu, 2014; Ilia, 2017; Pang, 2015) to emphasize the need but the domain has not reached a maturity yet, where they can be actually implemented, evaluated and used in some current STS.

The lack of joint ownership models and their adoption presents challenges such as photo tagging (Brandom, 2015), individuals running collective campaigns, spreading of misleading information (Robertson, 2016) etc.. Tagging a photo can be seen as an example, where one person tagging a friend displays the photo on both walls, without the consent of the second party. If this sharing followed a collective ownership policy, both parties would have to approve the tag. Further, for misleading information sharing, if sharing an object uses a collective ownership policy, the source of the created object can be tracked back to the original owner. This may reduce blind sharing, false propaganda and character assassination, as one might think twice before sharing inappropriate or misleading content that can be rejected, lowering your reputation with that party and the community. But since the only options currently available to the community are 'share' and 'like', such problems persist.

Online transactions should support different joint ownership and collective privacy models so that users can pick the one most suited for their social structure and interaction needs. Collective privacy policy needs the permission of both parties, e.g. a system might ask: *"You are tagged in this photo, allow it on your wall?"* Also, the availability of delegation, transfer and propagation of resources on someone's behalf introduce more refined ownership models and more rich online interactions. Moreover, the traditional principal/agent model, which states that anyone who is in possession of a resource that belongs to someone else acts as an agent for her principal (Bird, 1973), supports this and provides accountability over users' actions.

Collective action principle: *Collective actions require the permission of all the parties involved.*

6) Consistency

Consistency was first introduced by Aristotle who argued that "similar cases should not be treated differently" (Coons, 1987). This principle also applies to the law where lawyers argue cases based on precedence, i.e. that this case is like what went before (Coons, 1987). In digital systems, groups within groups are parent-child relations where any rules that apply to the parent also apply to the child, e.g. a family group within friends in general on Facebook that gets family photos will still get general friend photos. Forming and naming groups is a well-known social strategy to simplify choices and it certainly reduces the number of privacy settings needed in online systems. It is also stable, as rules made apply not only to current members but to future members also.

Likewise, when online objects like photos are categorized into a list "container" consistency means that any act upon the container also to its contents. Consistency simplifies social interaction, when one can configure a parent container knowing that this reflects to any child objects, it reduces confusion and the worry that each object will act differently. This may help in reducing enormous number of privacy settings on Facebook, which result in confused users and neglected too broad or too coarse privacy settings. Same confusion arises when users can see a photo belonged to a

group and can see some comment but not all, which causes the out of context interpretation of situation. Another interesting case of inconsistency is associated with privacy features on Facebook and Instagram. Some argued that the Facebook success was a result of providing a social requirement of personalized friend's circle (Debbarma, 2016), however, the advent of Instagram without personalized notification circles and even the famous 'share' feature signifies the need of consistent rules for various types of STS.

Social consistency is that social rules always apply, e.g. just as YouTube takes the right to allow videos in its space, or not, so it gives its users the right to have comments or not on their videos, as a commented video is a space within a space. Consistency lets one system space, owned by one system administrator, evolve into an online community by the delegation of rights in a consistent manner.

Consistency principle: *Technical systems can delegate social acts and rules to sub-groups and sub-items in a consistent way.*

3.2 Technical standards

In order to support the above social principles, technical standards are required. Most of the examples below are already implemented by few STS but not consistently, as variants exist within and across similar systems for no apparent reason. Again the list is not exhaustive but meant to exemplify the changes needed.

1) View

In technical terms, view as the right to 'read' an object is a passive act that does not affect the target, unlike active acts such as edit and delete. In contrast, in social interactions looking at another party does have an effect, as in some social species like gorillas staring is considered an act of aggression. In humans, being viewed significantly energizes the viewed party, an effect call social facilitation (Zajonc, 1965). Thus, when a video goes viral and is seen by many, its creator gets energized. If the video is offensive, the author may have to then delete it, because of its effect on others, for which the video poster is accountable. This illustrates that in a social system *viewing* is not a passive act, so people in a socio-technical setting consider carefully display options like public, private or a restricted group.

If a person posts a comment on a bulletin board that is rejected as being offensive by the moderators, others may not see it but the poster must be able to see what they posted in order to fix (edit) it. Likewise, whatever one may post 'in private' on Facebook is always visible to its moderators, who are accountable for what the space contains. In general, a space owner has the right to view any offspring – the child objects, of their space, e.g. a comment posted on a photograph should be visible to the poster of the photograph, but may not necessarily to other users. Ancestors – the owners of the parent space, should be notified of new postings (offspring) as the space owner owns everything in it.

Voting is an interesting case, where voters combine many voting acts into one vote result, which they created and so jointly own and are accountable for. It follows that they should *always* be able to view the vote result they created. Now while all democracies follow this rule, all online voting doesn't because it depends on the code. The view standard would codify the principle that if a vote is called, the voters who made it can view it.

***View standard*:** *One should be able to view objects for which one is accountable.*

2) Display

The right to display is not the right to view – *viewing* a video does not let one *display* it on their site. *Display is the view meta-right*, the right to assign the right to view an object, and privacy is that meta-right for personal data. Displaying a video on YouTube requires the consent of both the video owner and the space, just as posting a notice on a shop noticeboard requires the consent of both the poster and the shopkeeper. To put a text, photo or video in a space requires the consent of both its owner and the space owner but either of the two parties can choose not to display it. Interestingly, displaying a notice on a physical notice board and displaying a YouTube video have a lot in common, as highlighted in table 1:

Steps	Physical Notice Board	YouTube
Entry	Physically enter the shop.	Enter YouTube.
Introduction	Introduce yourself to the shopkeeper.	Create a YouTube persona.
Produce	Give them your notice.	Upload your video.
Edit	Amend as necessary to their requirements.	Add YouTube properties like title.
Post	The shopkeeper may post it or let you post it yourself.	Submit to YouTube to display.
Display	The public sees it.	The public sees it.
Removal	The notice can be removed by you or the shopkeeper.	The up-loader or YouTube can remove it.

Table 1: Steps involved in displaying a physical notice and uploading a YouTube video.

The same logic applies in both cases because the social system works the same in both mediums. The video creator initially owns the video, according to Locke (1690), then delegates the right to display it to YouTube, who can choose not to do so if the video fails decency or copyright rules. However, the space owner cannot modify the object as *he/she does not own it.*

Display standard: *Displaying an object in a space requires the consent of the object owner and the space owner.*

3) Public domain

The copy right act was established for the protection and to give appropriate credit to the creator of an intellectual property (Copyright Law, 2016). However, this copyright is awarded for a period of sixty years or if the creator expires, after which it becomes part of the public domain. This expiration gives some time to the creator to get the credit (in reputation or monetary terms) if any, of their creation, after which the work is open for the public use, which eventually benefits the society (Lessig, 2012). The rationale behind this expiry is that if every previous work was copyrighted and thus not available for the creator to get benefit, the new works could not be created.

The copyright act has provided protection to numerous creators and a large number of copyright lawsuits are filed against software piracy, file sharing and illegal uploading etc. However, when Disney copyrighted public domain stories like Snow White, questions have been raised on the copyright act and its fair use (Masnick, 2012). Some argued that it reduces the public good and transfer the wealth from the

families of the creators to the business giants, and raised the demands of perpetual copyright – the infinite copyright limit and even inheritance (Wentworth, 2002).

What people have given into the public domain should not be appropriated for ownership by other parties. Open-source advocates like GNU[3] and SourceForge[4] now use Creative Commons contracts[5] to ensure that no-one steals public domain items. The exception is personal data, which as an inalienable right that cannot be permanently given away. As a European Union court ruled, a couple of years ago, that Google must honor user requests to not *link* to personal data made public (Streitfeld, 2014), but in current standards the only solution is to remove the data, as Google argued.

***Public domain standard*:** *Non-personal information that has been placed in the public domain by its owner cannot later be taken back by others.*

4) Creation conditions

To create an object from nothing is as impossible in an information space as it is in a physical one. A creation cannot be an act upon the object created as it by definition does not exist, and one cannot get permission for what does not exist. The creation of an object changes the space it is created in, so creation is an act upon the space that will contain the created object, and the right to create it originally belongs to the space owner. This allows STS to evolve from simple beginnings, as if the system as the first entity is owned by a system administrator – the first actor. An online society can evolve as the founder person creates entities and delegates rights. To add a video, blog comment or board post requires the video, blog or board owner's consent. The 17th Century British philosopher Locke argued that creators owning what they create is fair and increases prosperity, whether it is a farmer's crop, a painter's painting or a hunter's catch (Locke, 1690).

The delegation of the right to create by a space owner may include *conditions* the creator agrees to beforehand, e.g. a university gives staff a space to create in, so a condition of employment can be that the university owns all its faculty's intellectual property. But this reduces creativity, as argued by Locke (1690), because then Facebook could likewise claim every post and YouTube every video.

An individual creating an object in a space should know if he/she can delete it, as ArXiv lets authors delete submissions but some Internet forum do not. For a Hotmail or Gmail account, the creation condition is that if one does not use it for some time it can be deleted. Similarly, as people have physical wills and next of kin, STS may let people manage their online accounts when they die (like Perpetu).

Creation conditions standard: *The conditions for a delegated creation in a given space must be clear in advance.*

5) Re-allocating rights

The ability to re-allocate social rights is the key to meeting social requirements. The right to re-allocate rights makes social interaction complex, but it also lets STS evolve from an initial state of one administrator with all rights to a community

[3] https://www.gnu.org/home.en.html
[4] https://sourceforge.net/
[5] https://creativecommons.org/

sharing rights (Ahmad, 2017). STS can evolve dynamically by re-allocating rights in the following ways:

1) *Transfer.* It re-allocates rights and meta-rights to a new owner, so selling a car transfers all rights to the new owner, and the old owner remains with no rights over it afterwards.

2) *Delegation.* It re-allocates use rights but not meta-rights so it is reversible, e.g. a landlord renting a house to a renter delegates it for a time, but later gets the house back.

3) *Merging.* It divides rights among actors who must collaborate to act. Any actor in a merged right can prevent the others to perform it; e.g. couples who jointly own a house must both sign to sell it.

4) *Sharing.* It replicates a right among actors, so each actor acts as if it owned the right exclusively; e.g. couples who severally share a bank account can each take out all the money.

Note that to automatically make the "friends of friends" also my friends is to not recognize the difference between delegate and transfer rights re-allocations. The attempt to make "friends of friends" also my friends in Orkut illustrates a technical option that failed because it had no social basis (Debbarma, 2016). To allocate a right to an existing object makes one accountable for it, so by fairness requires consent, e.g. one doesn't add a paper co-author without their agreement.

This rule provides platform for users to contribute towards the same object in different social settings. For example in publishing, a paper submitted online can give all rights to a primary author, or let them delegate rights to others, or merge their rights so all authors must confirm changes, or share rights so each author can do any change. Each policy has different social effects, as sharing is risky but invites participation while merging is safe but makes contribution harder.

Rights re-allocation standard: *Rights can be transferred, delegated, merged or shared.*

6) Communication

In traditional communication *richness* can be defined as follows:

1) *Position*. A choice, e.g. a raised hand.
2) *Document.* A static pattern, e.g. a text sentence
3) *Streaming.* A dynamic pattern, e.g. audio.
4) *Multi-stream.* Many dynamic streams, e.g. video as audio plus video.

However, if communication richness is about the human response, it also depends on the *communication linkage*, the number of people involved in the communication, defined as follows:

1) *Interpersonal:* One-to-one, two-way.
2) *Broadcast:* One-to-many, one-way.
3) *Matrix*: Many-to-many, two-way.

Matrix communication operates when a democratic group wants to act as one, for example when a nation votes for a new leader. The vote is the country telling itself what 'it thinks'. Just as an e-mail is a one-to-one communication from one person to

another, so voting is a many-to-many communication from a group to *itself*. By Locke (1690), the voters that create a vote result own it, so they should be able to view it. Tag clouds (Lee, 2010) illustrate matrix communication, as people clicking on a text link increase its font size, just as people walking in a forest form paths for others to follow.

If *communication performance* involves both richness and linkage, the advances of the last computing decade were more about linkage than richness, as chat, Twitter, texting, and karma systems are all simple text (Table 2).

	Linkage		
Richness	***Broadcast***	***Interpersonal***	***Matrix***
Position	Footprint, Flare, Scream,	Posture, Gesture, Salute, *Smiley*	Applause, Election, *Web counter, Karma system, Tag cloud, Reputations, Social bookmarks*
Document	Poster, Book, *Web site, Blog, Online photo, News feed, Instagram, Tweet*	Letter, Note, *Email, Text, Instant messaging, Social networks*	*Chat, Tweet, Wiki, E-market, Bulletin board, Comment system, Advice board, Social media*
Streaming	Radio, Record, CD, *Podcast, Online music*	Telephone, *Cell phone, Skype*	Choir, Radio talk-back, *Conference call, Skype conference call*
Multi-stream	Speech, Show, TV, Movie, DVD, *Online video*	Face-to-face talk, *Chatroulette, Video-phone,Skype video*	Face-to-face meeting, Cocktail party, *Video-conference, MMORPG, Simulated world*

Table 2: Communication performance by richness and linkage [Whitworth, 2014]

In communication, a sender creates a message then offers it to a receiver, who may accept it. Privacy is the right to remain silent, to not communicate and to not receive messages. In the physical world, people say "Can I talk to you?" because communication is by permission. It is a joint act that requires the consent of both parties. However, the "send and forget" design of email enables spam by allowing communication without consent, but current systems like Skype and Twitter acknowledge this fact and require receivers' consent before communication. Problems like spam arise when developers forget social principles in the design of socio-technologies.

Communication standard: *Every communication act requires prior mutual consent.*

7) Transparency

Transparency refers to different forms of information visibility (Turilli, 2009). It does not contradict privacy, the right to control information about oneself. Transparency can be given when a party decides to disclose information, or demanded when the social rules require it. Transparency standards are essential to implement social principles like accountability and ownership.

Transparency can be ethically neutral, when revealing information is just a design choice[6], but its impact applies in at least two types of relationships (Turilli, 2009):

[6] For instance, information about operating system processes

a) *Dependent.* When information disclosure is required to endorse some ethical principle like accountability, informed consent etc.
b) *Regulatory.* Where ethical principles regulate the information disclosure, for example in cases of privacy or copyright, or where false or partial disclosure of information may impair some ethical principle.

In dictatorships control works top-down, but in democracies control from "the people" is loaned to a leading group for a period of time. In latter case, transparency is that the people who put the leading group in power have the right to observe their actions while governing. So, social transparency is not just visibility in general but the visibility of governance. For example, if I travel on holiday my trip is private but if I travel on government money, what I spend it on should be public knowledge.

Some online systems apply transparency, e.g. the success of Wikipedia relies on its transparent moderation, where everyone can see who made what edits to give the current result. Yet in most online systems, what moderators do is secret, so they are more dictatorships than democracies. A transparency standard would require that who and what of all moderator acts be public, e.g. that moderator A deleted post B would be visible, even if the contents of the deleted post are hidden. Transparency is the basis of all freedom of information rules.

Transparency standard: *That any act by any person chosen by a group to govern them shall be visible to all the members of that group*.

4 A Framework for Online Bill of Rights

Based on various principles and standards outlined above, a framework for online bill of rights is introduced which includes functionalities, key components and their interactions (see Figure 2). The framework is based on three step socio-technical design comprised of: a) defining the system, b) identifying different threats and c) proposing countermeasures (Al Sabbagh, 2015). The framework also represents a roadmap indicating significant areas of future research for designing, implementing, and deploying systems able to support the online bill of rights. The framework governs by principles of joint causation – the personal and technological subsystems are both affected by the environmental factors, and joint optimization – the system is optimized by taking into account both the personal and technological aspects.

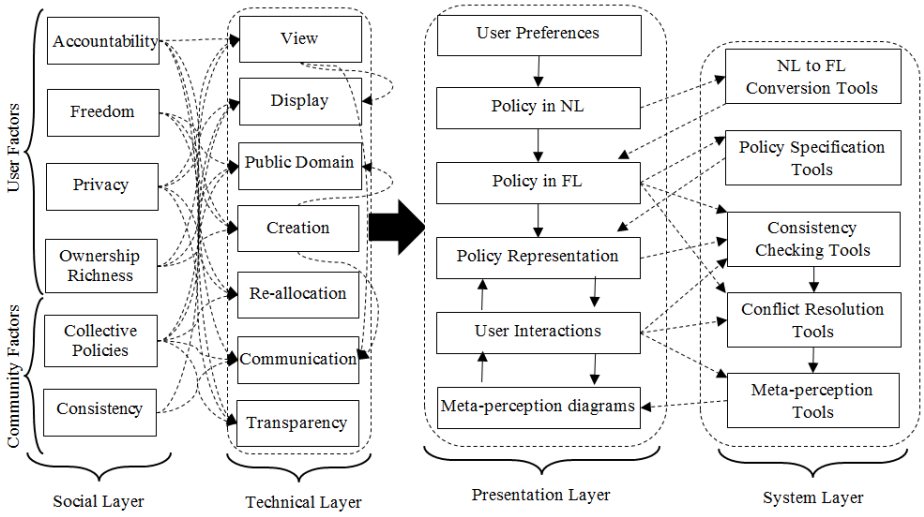

Figure 2: Framework for a Bill of Online Rights

The framework for the bill of online rights is comprised on four layers namely social, technical, presentation and system. These layers offer common social principles, their respective basic technical principles, users' requirement capturing and implementation of those requirements, respectively. The social layer is based on the social principles of accountability, freedom, privacy, ownership richness, collective policies and consistency. These factors – based on design principles outlined earlier, govern the design of the whole framework, its components and their interactions. Also, within this layer, the factors can be categorized as user factors and community factors, where the former seeks users to participate in the formation of their own policies, while the latter attempts to maintain the interaction norms of the community. Various community synergy benefits cannot be achieved without the cooperation of the individuals thriving towards a common goal.

The technical layer is based on the technical principles of view, display, public domain, creation, re-allocation, communication and transparency. The technical principle of 'view' supports the social principles of accountability, ownership and privacy. The technical principle of 'display' supports the social principles of privacy, consistency and democracy. The technical principle of 'public domain' supports the social principles of freedom, democracy and ownership. The technical principle of

‘creation’ supports the social principles of accountability, ownership and freedom. The technical principle of ‘reallocation’ supports the social principles of democracy, privacy and freedom. The technical principle of ‘transparency’ supports the social principles of accountability, democracy and consistency. The technical principle of ‘communication’ supports the social principles of democracy, privacy and accountability. Also, view principle supports display and transparency principles. Creation principle supports public domain and transparency principles. This layer can be enhanced to incorporate more technical principles derived from different social principles.

The presentation layer comprises of various software agents to list, represent and manage users’ preferences at different levels. It bridges the gap between policy and the actual mechanism. The presentation layer first acquires various preferences of users and devises policies in natural language (NL). Interactive policy modules need to be designed that provide accurate policy to the users, in order to enhance their trust. This policy, represented in NL, is then converted into formal language (FL) so various policies can be compared and analysed without any ambiguity to reduce the risks of common pitfalls. This can be done with the help of various NL to FL conversion tools available in the system layer.

This FL policy is then specified in STS through policy specification tools, present in the system layer, to precisely capture the privacy properties the system must adhere to, and is represented through policy representation in the presentation layer. In order to reach a consistent privacy policy for each user, this policy representation module also takes input from user’s interaction with other users in the system. When different users interact with each other, their interaction can take many interesting forms (some of them are outlined in previous sections). Policies of different users in the system can overlap, conflict and contradict with each other, for which automatic consistency analysis tools and conflict resolution tools are needed in the system layer. Both of these types of tools take input from FL policies along with the users’ interactions to resolve conflicts and contradictions to make users’ policies consistent.

When dealing with privacy policy specification and representation, one of the major problems often arise is that users unintentionally misconfigure their privacy settings, so their visibility of their information differs in their perception of policy specification and in system representation and its implementation. Meta-perception tools in the system layer are needed for the users to aid them view the exact state of rights and visibility of others over their objects, thus precisely reflecting how other users see them, their domain and various objects in it. These tools can analyse one’s privacy policy and visibility status along with interaction with other users on the same data. However, these tools need to be designed after comprehensive analysis of users’ preferences and their online social interactions behaviour.

The presented framework is an initial attempt to exemplify several social principles along with initial technical standard to support them. Further, it outlines the presentation of users’ requirements and its various methods as well as the need of applications to facilitate and precisely address them. The framework leads the way towards solving users’ problems that persist for a decade by providing a methodology of rights implementation for STS, as with the advent of new STS, variants of the same social principles appear more often. With every successful venture, we may assume that we have clearly understood the needs of global internet community; however,

with different variants of the same social principles, by repeating the same mistakes in understanding them and by ignoring users' requirements, the failure rate of new applications is also on a rise, which advocates the need to simplify, argue and decide upon social as well as technical principles for a free, open and neutral internet.

5 The future

This paper offers two main contributions towards the design of socio-technical systems. The first consists of investigating and outlining the social principles and their relation to technical specification that STS, being social systems on technological base, should support. The second is the outlining the framework that assist in STS design phase by providing appropriate tools for each stage and identifying gaps for tools and further research investigation in STS domain. Along with it, the framework also provides a methodology to investigate and incorporate new social principles and their respective technical features. This framework bridges the gap between social requirements and technical requirements by proposing that social requirements can act as a pre-requisite for technical requirements, which should be outlined at the design stage. This not only allows the adaption of STS based on social grounds but also presents an opportunity to implement transparency in a way more acceptable to the social society. This paper initiates the debate towards the investigation of challenges of how social principles can be related to online systems and how future STS should be build.

We could wait until the social logic is finalized, but humanity is still working on that, and designers building systems now cannot wait. In social evolution, some legitimacy is always better than none, as each step forward builds on the last. Now it is up to the research community how they want the future internet to be: a dangerous and broken cyberspace, uneven and unequal gains, or broad and unprecedented progress, as discussed in Global Commission on Internet Governance (GCIG, 2017). Systems like Wikipedia and Kickstarter are both relatively new technologies and new social forms, based on community synergy as well as community sanctions, punishment and justice. Online communities need people to participate and people need to trust their community. When online social standards based on legitimacy are implemented, online society will flourish as never before. In the past, declarations, constitutions and laws preserved advances like democracy, but today, the Internet's social gains, which Berners-Lee says must be preserved or they will be lost, relies on code. This article is a first step, but the community is needed to discuss what is socially right and online workable because only global technical standards can encode a bill of online rights.

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