

Internet Censorship Circumvention Technology Use

And Youth Citizenship Building

A study through the lens of Adaptive Structuration Theory and Diffusion of Innovation

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Introduction

The Internet has brought new dynamics of socio-political changes in China, as state power and social forces are transforming in an Internet-mediated public space. However, the Chinese government conducts the most extensive Internet censorship in the world. In mainland China, the government blocks its citizens' access to some parts of the global Internet by operating the "Great Firewall", a censorship and surveillance project. For Chinese Internet users, their ability to access foreign news and information is at stake. Internet censorship circumvention describes various processes used by Internet users to bypass the Internet filtering and gain access to otherwise censored information. Because the Great Firewall blocks destination IP addresses and domain names and inspects the data being sent or received, a basic censorship circumvention strategy is to use proxy nodes and encrypt the data. To accomplish this, Chinese Internet users adopt a variety of technology to bypass it. In deciding to "jump over the wall", as the Chinese phrase puts it, users are often seeking a better way to exchange information with others in China. On foreign sites and platforms, they can connect socially and exchange information with other mainland Chinese. Essentially, Internet censorship circumvention is a communication activity.

Technology promises to engage more young people and to make government more open and accessible (Mossberger et al. 2009). Internet Censorship Circumvention (ICC) technology, such as uProxy and Freegate, enable people to access otherwise blocked sites. In this sense, not only is ICC technology a political empowerment, but the online resilience to censorship becomes an integral part of political engagement and civic learning. Drawing upon Adaptive Saturation Theory, this study finds that Chinese youth is building their self-actualizing citizenship through use of ICC technology. In applying Diffusion of Innovation theory, it is suggested that ICC technology will not get diffused among general population, however, there is great potential for it to be widely adopted among the young and the educated. In so saying, use of censorship

circumvention technology will probably not bring ‘revolutionary’ political change to China, but it is expected to at least lead the young generation to embarking on the evolutionary path toward increased pluralism and possibly nascent democratization.

Two Theories On Focus

- **Adaptive Saturation Theory**

Adaptive structuration theory (AST) is crucial for our understanding of the censorship circumvention technology use in China. If online resilience to government control is another form of political engagement and civic learning, to what extent is this online activism meaningful for the evolutionary democratization in China? To understand precisely how technology structures can trigger organizational change, it is first necessary to delve into the complexity of the technology-action relationship. Through the lens of AST, this research explores how the political indoctrination traditions are challenged and a new form of political participation is created through the use of ICC technology.

AST has its roots in Giddens' structuration theory, which rejects the polarity in the agency-structure debate, positing a social process that involves the reciprocal interaction of human actors and structural features of organizations. In this theory, the role of human actors in reaffirming structural properties is highlighted so as to avoid reification. The recognition that actors are knowledgeable and reflexive is a central premise.

While Giddens does not explicitly address the issue of technology in his structuration paradigm, theories have been adapted to study group decision support systems in particular (Poole and DeSanctis 1990,1992) and advanced information technologies in general (DeSanctis and Poole 1994). AST extends current structuration models of technology-triggered change to consider the mutual influence of technology and social processes (Poole and DeSanctis 1994). Consistent with structuration theory, AST focuses on social structures, rules and resources provided by technologies and institutions as the basis for human activity. Social structures serve as templates for planning and accomplishing tasks (DeSanctis and Poole 1994). AST eschews the "technocentric" (DeSanctis 1989) view of technology use and emphasizes its social aspects

because groups "mediate technological effects, adapting systems to their needs, resisting them, or not using them at all" (Poole and DeSanctis 1990, p. 177).

Initially, AST has been employed to the use of group decision support systems (Poole and DeSanctis 1989, 1990) and computer conferencing systems (Robey, Vaverek and Saunders 1989). More recent applications of this theory are intended to assess the strategic adoption of social media by large global organizations (Jollean and Clinton, 2011) and information technology use in a healthcare setting (Triche et al. 2011). Key elements of AST have been used to account for consumer-marketer relationships in electronic commerce and guide research on interactive advertising (Pavlou and Steward, 2014). However, the extant AST research is restricted to group and organization levels. The study of technology that challenges the status quo of institution in the larger scope is lacking. However, in real-world scenario, such as Arab Spring, information technology such as SMS and social media have prove their roles in social movement. By applying AST to ICC technology use in China, this study hopes to reduce the gap.

- **Diffusion of Innovation**

If AST contributes to the understanding of political engagement and civic awareness in the use of ICC technology, Diffusion of Innovation (DOI) Theory will further uncover the agent of change by capturing characteristics of ICC technology and its users, and predict the potential success or failure of diffusion of the circumvention technology. Both of the theories emphasize the actor and technology's interplay in the social system, providing insights for ICC technology use.

Rogers' theory (1995) identifies four main elements that come together to form the theory of diffusion of innovation: innovation, communication, time, and the social system. An innovation is an idea, thing, procedure, or system that is perceived to be new by whomever is adopting it. The innovation does not need to be new in terms of being recently developed; it only needs to be new to the adopters. According to DOI, the pace of diffusion relates directly to the five attributes (characteristics) of the innovation: relative advantage, compatibility, complexity, trialability, and observability, all of which may be perceived either positively or negatively.

Communication is the process by which people develop and share information with each other to achieve common understanding (Rogers, 1995).

There are three components of the element of time: the innovation-decision process, adopter categories, and the rate of adoption (Rogers, 1995).

- The “innovation-decision process” encompasses the timeframe from when the potential adopter first becomes aware of the innovation through to the point at which the potential adopter either adopts or rejects the innovation. There are five steps along this continuum: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995).
- “Adopter categories” provides discrete categorization to measure the inclination of an individual to adopt new ideas as compared to other members of the social system. The categories are labeled as “innovator”, “early adopter”, “early majority”, “late majority”, and “laggard”.
- The adopter categories lead into the third component of the time element, the “rate of adoption”. The rate of adoption is the speed at which an innovation is adopted within a social system (Rogers, 1995). Innovation adoption tends to follow an S-shaped curve. The characteristics of the innovation described earlier have a predictable impact on the rate of adoption, but the rate is influenced by other factors as well, including the social system.

All diffusion occurs within the final element, social system - whose members may be individuals, groups, organizations, or subsystems - that share a common goal or objective that links them together as a social system. Opinion leaders, change agents, and champions are the people within a social system who have the ability to influence the diffusion of innovation within a social system (Rogers, 1995).

There is a wealth of studies based on the DOI model. From the DOI perspective, studies have been conducted to identify barriers for specific innovations to be adopted in the field of science and technology, education, health and so on (Van de Ven,1986; Marcus and Weber, 1989). Some research substantiates and extends parts of Rogers' theory, and provides more specific elements. For example, Damanpour (1992) finds that size is a key organizational structure factor

in the diffusion of innovation, and it was more strongly related to the implementation phase than the adoption decision phase (Damanpour, 2003). It is noted that the development and research for DOI theory began with, and still primarily focuses on, diffusion and adoption by individuals rather than within organizations. This provides an opportunity to more fully extend Rogers' work into the organizational setting (Lundblad, 2003). As DOI is very comprehensive, this study has identified the DOI concepts that are most relevant. These concepts provide a useful framework for analyzing the current users of ICC technology and its adoption process in China.

Self-Actualizing Citizenship and ICC Technology Use: an Application of AST

Building citizenship and growing democracy in China is not impossible, but requires a different path. Unlike countries like The United States, the opportunity for Chinese youth to participate in political process is limited. The Internet is probably the only platform where Chinese people engage in political discussion and express their opinions. Self-actualizing style of civic participation is a conception expanded by Bennett (2008). Compared to the traditional paradigms of dutiful citizenship oriented through parties and voting, self-actualizing learning favors networked activities through interactive media. In the lights of AST and Structuration Theory, it is maintained that the online resilience to censorship by the use of ICC technology is a self-actualizing style of civic participation.

- **ICC Technology as Structure: Resource and “Spirit”**

When humans act in organizations or groups, they create and recreate three fundamental elements of social interaction: meaning, power, and norms (Giddens 1976). Giddens (1984) suggests that even when individuals are oppressed, they will still have resources available to overcome the status quo. In China, Internet censorship imposed by a restrictive government not only constrains the freedom of speech but also oppresses the need for information. With the resources provided by ICC technology, online resilience to the censorship is the individual exercising their power against governmental coercion.

As the notion of structuration is central, AST describes the interplay between advanced information technologies, social structures, and human interaction. Two types of structures must be considered in the interplay; first, is the structures in technology, or *structural potential*, and the second is structures in action, which are specific *structures in use*. The two are continually

intertwined; there is a recursive relationship between technology and action, each iteratively shaping the other (DeSanctis and Poole 1994). Accordingly, social structures provided by ICC technology can be described in two ways: the structural features of ICC technology, and the spirit of it.

“Structural features” are the specific types of rules and resources, or capabilities, offered by the system. ICC technology provides resources for self-actualizing style of civic participation. Features within ICC technology include the capability to circumvent the Great Firewall and other censorship methods, such as IP address blocking, DNS filtering and redirection, URL filtering, etc. A successful circumvention guides the individuals to uncensored information that contributes to civic awareness, and exposes them to politically plural social media that are blocked by the Chinese government.

The social structures of ICC technology also can be described in terms of their spirit (Poole and DeSanctis 1990). “Spirit” is the general intent with regard to values and goals underlying a given set of structural features. Webster defines spirit as the “general intent” of something, as in “spirit of the law,” and AST construes the spirit of a technology in the same sense (DeSanctis and Poole 1994).

The spirit of a technology provides what Giddens calls “legitimation” to the technology by supplying a normative frame with regard to behaviors that are appropriate in the context of the technology. It also can function as a means of signification, because it helps users understand and interpret the meaning of the technology. In this sense, by using ICC technology, not only are the users fulfilling their need for the uncensored information or websites, but they also are internalizing and digesting “spirit” of ICC technology, which is comprised of values and principles, such as freedom of speech and democracy. As DeSanctis and Poole (1994) suggest, the spirit is the “official line” which the technology presents to people regarding how to act when using the system, how to interpret its features, and how to fill in gaps in procedure which are not explicitly specified. By interacting with ICC technology, Chinese youth are adopting the whole system embedded in it. As a result, they might embrace the democracy while challenging an authoritarian system.

- **Reflexibility and Knowledge**

As mentioned above, the use of ICC technology constitutes a form of political engagement, and calls a political system into question. In order to look at a bigger picture, it is important to revisit Structuration theory.

The “reflexibility” and “knowledge” of the actor are deemed central to the premise of Structuration. “Reflexivity” refers to the actor’s ability to routinely observe and understand their actions or behaviors. During the use of ICC technology, there could be a variety of uncertainties involved. For example, the censorship circumvention activity might be detected by the government, and individual privacy might be breached. The users would have to weigh the gains and benefits of their behaviors of censorship circumvention. In this reflexivity, a decision must be made on the continued use of ICC technology.

Giddens distinguishes between discursive and practical knowledge - the former referring to knowledge the actors are able to articulate (what is said) and latter to tacit knowledge - on which actors are able to draw on in action but are unable to express (what is simply done). Whether in social media or interpersonal communication, the knowledge of ICC technology could be articulated and shared in public, but this knowledge could also be tacit.

The Paradox of ICC Technology Adoption in China: an Application of DOI

It is important to identify two lines of diffusion process among Chinese, first, low uptake rate among the general population which indicates the failure of diffusion; second, high potential for ICC technology to be adopted among the young, educated, and free-spirited.

Although ICC technology is widely accepted by those youth that are tech-savvy and educated, the average Chinese Internet user, unfortunately, lack the knowledge and means of access needed for bypassing government censorship. Diffusion of Innovation (DOI) theory provides a compelling rationale for explaining this paradox. Furthermore, a deeper understanding of the behavior of internet users who have adopted ICC technology can be obtained from coupling DOI theory with findings from surveys conducted by organizations like OpenITP, which promotes a free internet initiative.

Innovation in this context encompasses both the idea of censorship circumvention and the use of ICC technology. Five attributes from the DOI perspective help to explain ICC technology's rate of adoption: relative advantage, compatibility, complexity, trialability, and observability.

- “Relative advantage” is the perceived improvement over currently existing technology that the innovation intends to replace or enhance. The role of ICC technology is far broader than simply helping people access particular censored content—the tools are also useful, and perhaps more useful, for people making apolitical uses of platforms and services that are blocked. Specifically, notable benefits could be to access blocked search engines, such as Google, , blocked social networking sites, such as Facebook, or to read foreign news sources, such as the New York Times, among many other uses.
- “Compatibility” is the measure of how well the innovation aligns with the experiences, values, and needs of whoever is adopting the innovation. Internet censorship is not salient and well pronounced in public. While the activity of circumventing censorship has not been outlawed, the unintended result of adoption is greater government censorship, further controlling and surveilling the flow of information. This is a key factor that determines the ICC technology is unlikely to get widely diffused among the general public. However, from the perspective of people using ICC technology, they are motivated to use it and have a high discontent with current political policy. The innovation is compatible with their political value and orientation. Once they uptake ICC technology, they become loyal users - two thirds of these users said they relied on circumvention technology every day (OpenITP 2013).
- “Complexity” relates to ease of understanding and use of an innovation; simple ideas are adopted faster than complex ones. The most commonly used tool is GoAgent (OpenITP 2013), a personal proxy server that is user-friendly and easy to install in the browser, that even the most untrained Internet user is able to operate it. In comparison, setting up a Virtual Private Network (VPN) service, another form of ICC technology, which allows a user's Internet software to tunnel through a remote server uninhibited, can be rather complicated. Its adoption among users is rather limited. ICC technology adoption is highly dependent on its complexity; it too complex, it may become a privilege for educated users..

- “Trialability” is the level at which an innovation adopter can test and assess the innovation before fully adopting and implementing; Currently, ICC technology in China is adopted mostly among the young and highly educated group of people - The median age of 26 years old and mean age 27.7 years old. 78% of the users are university graduates or above, among whom 58% are university graduates, and 20% are postgraduates (OpenITP 2013).
- “Observability” is how visible the innovation is to others; and, when an innovation is readily observable by those considering adoption, it is adopted faster. For the general population, this innovation is not observable and will remain so for the sake of privacy and security. Again, it is substantiated that ICC technology is unlikely to gain popularity across the whole Chinese society. However, the observability might be higher among the social circles where there are ICC technology users who make their censorship circumvention activity public in either social media or interpersonally.

In diffusion theory, communication is essential for the five-step innovation-decision process. In the first two steps, general awareness and knowledge of ICC technology is low, as few people in mainland China know about the existence of the censorship policies, let alone having interest in circumventing it. However, it is worthwhile to focus on the communication process among the existing ICC technology users. According to the Open ITP survey (2013) result, when asked "How did you learn about the first tool you ever used?", a wide majority of the respondents (80%) said they found their first circumvention tool through web search, blogs or news. After acquiring their first tool, most respondents resolved ongoing configuration issues through continued to use these same avenues. Despite the best efforts by the government to block information about circumvention tools, Internet users in China are still widely able to perform self-help, and find useful information independently online. Interpersonal mouth-to-mouth communication also plays an important role in the process. According to another survey conducted via social media (Jason Ng 2010), a dominant 85% of the 5,400 respondents reported that they had taught friends about the existence of the censorship policies and the availability of circumvention.

Opinion leaders are at the center of interpersonal communication networks, and can thus serve as the model to be imitated when adopting an innovation, or to opposing it (Rogers, 1962). Again,

it is necessary to distinguish between the two diffusion process among the general population and the young group. Due to the political climate in China, opinion leaders and change agents in the general population are not able to promote ICC technology. In contrast, opinion leaders and change agent could be identified among those users who are influential in their personal networks, such as the aforementioned users who teach friends about ICC technology. They could employ various social media platforms to building up the awareness and knowledge of ICC technology.

Change agents, according to Rogers, are external to the system but represent change and innovation to the system. They often are not seen as similar to the rest of the members of the system, rather possessing some special knowledge or expertise. They are crucial to the decision especially in the adoption and implementation process. Referring to the aforementioned Ng 2010 survey, when asked "do you turn for help when you have problems with circumvention tools?", 85.5% said they would turn to blogs or online forums. Change agents employ various social media platforms to help with the implementation of ICC technology. such as the "GFW Blog16", a popular and trusted source for censorship circumvention information—shows strong unmet demand for effective circumvention tools .

Rogers suggests early adopters have a higher social status, financial liquidity, advanced education and are more socially forward than late adopters. They are more discreet in adoption choices than innovators. They use judicious choices of adoption to help them maintain a central communication position. The survey findings (OpenITP 2013) are in line with Roger's adopter category. On the basis of innovativeness, the current users of ICC technology are early adopters who are young, courageous, educated and technology-savvy. They also have a strong desire to take advantage of the full range of Internet technologies— including use of globally popular social media tools and video streaming sites, and doing other complex tasks that require a technologically versatile connection to the global Internet. Archived copies of censored static content, even if widely available, would not meet their needs. They will install special software and learn new skills in order to obtain Internet freedom that is as reliable and fast as possible so they can conveniently access social networking and rich media such as video.

Homophily can be observed from these early adopters. “Homophily” is the extent to which two or more people who communicate perceive that they are similar to one another (Lundblad, 2003). Among the respondents who are current users, 43.5% are employed in the Information technology, computer, and software related industries, and 21.1% are students (OpenITP 2013). The high percentage of these two occupations shows a high level of “homophily” among the users, who are highly cluster in technology firms and universities in China.

Limitations of the Theory Application

There are limitations in each theory that worth addressing. DOI theory focuses primarily on the diffusion and adoption by individuals rather than within organizations. With respect to ICC technology, users are highly clustered among technology firms and universities. Little is said about diffusion across organizations, leaving a need for AST as a supplement. The five-step process of innovation for decision-making, as described by DOI theory, is criticized for its linearity. This falls short especially in analyzing ICC technology in China, where there are two distinct diffusion patterns. There is also a need to fully describe the interaction between the innovation, the adopter, the social system, and the other influencers of adoption, especially how these units of the theory relate to diffusion of innovation within organizations. As for the AST, although it allows for a deeper and more dialectical understanding of the interaction between technology and society, can be difficult to model. These two theories complement each other, and a combination of the two provides an unparalleled insight into the limits and opportunities of human choice, technology development and use, and society change.

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