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# Technological Innovation: A Case Study of Mobile Internet Information Technology Applications in Community Management

Wan Su

Xiaobo Xu

Yangchun Li

Francisco J. Martinez-Lopez

Ling Li
*Old Dominion University*



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*Jin Chen received the PhD degree from the National University of Singapore (NUS) in 2012. She is currently an Associate Professor in the Department of Management Science and Engineering, School of Business, East China University of Science and Technology, Shanghai, China. She has published her research work in international journals, such as Research Policy, IEEE Transactions on Engineering Management, Information & Management, European Journal of Information Systems, International Journal of Electronic Commerce, and Electronic Markets. Her research interests include information technology innovation and entrepreneurship in emerging markets, and the impact of innovative information technologies.*

*Wei Yang Lim is currently Director at Deston Precision, a Singapore manufacturer of precision plastic parts and molds. He is also a council member of Singapore Precision Engineering and Technology Association. He received the MPhil in Management degree from the University of Cambridge, UK, in 2012. His interests include innovation in manufacturing through cyber-physical technologies, team dynamics and process reengineering.*

*Bernard C.Y. Tan is Senior Vice Provost at the National University of Singapore (NUS). He is Shaw Professor of Information Systems and Analytics at NUS, where he has won university awards for research and for teaching. He was the 15th President of the Association for Information Systems. He is a Fellow of the Association for Information Systems. He has served on the editorial boards of MIS Quarterly (Senior Editor), Journal of the AIS (Senior Editor), IEEE Transactions on Engineering Management (Department Editor), Management Science (Associate Editor), ACM Transactions on Management Information Systems (Associate Editor), and Journal of Management Information Systems (Editorial Board Member). His research has been published in ACM SIGMIS Database, ACM Transactions on Computer-Human Interaction, ACM Transactions on Information Systems, ACM Transactions on Internet Technology, ACM Transactions on Management Information Systems, Communications of the ACM, Decision Support Systems, European Journal of Information Systems, IEEE Transactions on Engineering Management, IEEE Transactions on Professional Communication, IEEE Transactions on Systems, Man, and Cybernetics, Information and Management, Information Systems Frontiers, Information Systems Research, International Journal of Human-Computer Studies, Journal of Global Information Management, Journal of Management Information Systems, Journal of the AIS, Journal of the American Society for Information Science and Technology, Management Science and MIS Quarterly. His current research interests are social media, virtual communities, and Internet commerce.*

*Hong Ling is a full professor and Department Chair of Information Management & Information Systems, School of Management, Fudan University, China. He holds the PhD degree of Fudan University. He has worked as a Research Fellow at City University of Hong Kong and Visiting Scholar at Sloan School of Management, MIT. He has published more than 100 papers in professional journals and conferences such as Journal of Management Information Systems, Communications of the ACM, Decision Support Systems, Information & Management, Computers in Human Behavior, Knowledge Management Research & Practice, International Journal of Innovative Computing, Information & Control, Journal of the Operations Research Society, etc. His research interests include IT Strategy & Management, Business Process Reengineering, Electronic Business, Knowledge Management, etc.*



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# Technological Innovation:
## A Case Study of Mobile Internet Information Technology Applications in Community Management

Wan Su, School of Management, Jilin University, Changchun, China

Xiaobo Xu, School of Business Administration, American University of Sharjah, Sharjah, United Arab Emirates

Yangchun Li, Department of Business Administration, University of Granada, Granada, Spain

Francisco J. Martínez-López, Deptartment Business Administration, University of Granada, Granada, Spain & EAE Business School, Barcelona, Spain

Ling Li, Strome College of Business, Old Dominion University, Norfolk, USA

## ABSTRACT

The Mobile Internet Information Technology (MIIT) has been widely accepted as one of the most promising technologies in the next decades, having various applications and different value positions. However, few published studies explore and examine the effects of MIIT on community management. Based on the Dramaturgical Theory, this article uses a case study method to get an insightful understanding of MIIT. This article found that the MIIT was used by grid organizations to realize technological innovation and change organizational routines and structures, but eventually it was shaped by them, so this new technology was only able to embed itself into the public service model as a secondary or complementary role.

## KEYWORDS

Case Study, Community Management, Criticism, Dramaturgical Theory, Mobile Government, Mobile Internet Information Technology, Service Model, Social Governance

## 1. INTRODUCTION

It is estimated that there are roughly 2 billion smartphone users in the global market. The huge number of mobile users creates a blooming environment for the Mobile Internet Information Technology (MIIT). In broad terms, the MIIT is defined as a branch of information technology which needs connecting to the wireless or mobile Internet. The next decade is likely to witness a considerable rise in the use of MIIT. For instance, MIIT has been widely used in mobile computing, location-based services, mobile banking, mobile commerce, etc. Due to various technical applications and different value positions, the strategic and crucial role of MIIT in the domain of community management and social governance is still ill-defined. Therefore, the aim of this study is to extend the current knowledge of what effects the MIIT has on community management. Besides, this research also finds

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a relatively new case study paradigm based on the Dramaturgical Theory. Technological innovators could also learn lessons about how they should tackle similar technological innovation issues in their management practice.

This paper is organized as follows. Section 2 conducts the literature review. Section 3 discusses both the research question and the research methodology. Section 4 then presents findings from the case study. Section 5 further discusses these findings and the case. Section 6 summarizes the contributions of this study, and future research directions are also addressed in this section.

## 2. LITERATURE REVIEW

### 2.1. Mobile Internet Information Technology and Community Management

Technological innovation based on mobile technologies has been rapidly developed during recent years (Xu et al., 2014). Most technologies are applied to promote commerce and business transactions. The supply chains related to commerce and business transactions are forming a business ecosystem (Gorkhali & Xu, 2016; Xu, 2011). Balboni et al. (2015) stated that mobile technology produces various applications: context-driven interactions, location-based marketing, mobile tracking, immediate consumption, borderless workforce, and augmented reality. Thus, MIIT applications can be adopted in different management fields. For example, Liu and Yang (2011) proposed an intelligent model to realize a practical and intelligent community management system by using applications based on the Internet of Things (IoT), as IoT is a promising emerging technology (Bi et al., 2014; Kim, 2017; Li et al., 2015; Liu et al., 2017; Mao et al., 2016; Whitmore et al., 2015). Jalali et al. (2015) presented a smart architecture where both community service providers and residents can access to real-time data collected from sensory systems. After analyzing current problems in the smart community, Zhu et al. (2012) identified the community e-service technology from a comprehensive analysis of the smart community features and information technologies applications. Some scholars also studied the less "Internet-alike" part of mobile Internet, and suggested that local activities are particularly important for the use of new mobile technologies (Ghose et al., 2013) which is very congruent with the local-focused managerial characteristic of community management.

Other researchers proposed various applications of MIIT for community management. For example, Yuan and Peng (2004) examined the information value by combining voice-information sharing and location-based information service. Fitch and Adams (2006) discussed the crucial role of mobile technology in community healthcare provision. Bohari and Zan (2012) focused on the strategy of using wireless technology for rural community development as wireless technology is a promising emerging technology (Finogeev & Finogeev, 2017; Li et al., 2012). Dempster et al. (2012) studied people's perceptions about IT community management of cancer pain and their perceived weaknesses in the current systems and expected future systems (Fan et al., 2014; Xu et al., 2014; Yang et al., 2016; Yin et al., 2016). Additionally, Tomlinson et al. (2013) investigated how community health workers can improve their care quality by using a mobile information system. Tumusiime et al. (2014) also introduced a mobile information system to community health workers for integrated community case management. Wallace (2015) presented opportunities and challenges brought by mobile communication to the community healthcare.

Given the fact that the community management needs a large amount of residents' private information such as social insurance, community security, birth control and so on, the MIIT may also have negative effects on community management due to privacy and security issues. For example, Google invented a popular free smart phone game, Ingress, so as to access users' private location information (Hulsey & Reeves, 2014). Chopra (2014) presented a critical discussion about how Internet negatively affects people or their use of Internet in an appropriate way.

Journal of Global Information Management
Volume 26 • Issue 2 • April-June 2018

### 2.2. Dramaturgical Theory

This study employed the analytic paradigm of Dramaturgical Theory (Clark & Mangham, 2004; Collinson, 2006; Gardner & Avolio, 1998; Turner & Stets, 2006). The dramaturgical perspective involves the deployment by an organization of dramatists, actors, directors, set designers, lighting specialists, and musicians to put on plays in front of audiences (Clark & Mangham, 2004). Generally speaking, the Dramaturgical Theory argues that social reality is consisted of a series of planned scripts, performed by intertwined actors on stage, and changes in a drama are not unacceptable since alternative scripts could take the stage when political methods are used for choosing better scripts (Clark & Mangham, 2004). According to the Dramaturgical Theory (Goffman, 1959), human interaction is regarded as a process of referring one subject to other people, which means the interaction is a social referral process -- an act of "submitting" the self to other people for judgment only because these people are audience -- which inevitably is vulnerable and problematic. Besides, "meaning" is the byproduct of human interaction, so how people express themselves to others to "create meaning and influence is the central focus of dramaturgy" (Gardner & Avolio, 1998, p. 33).

Dramaturgy emphasizes the role of impression management and the metaphorical use of theatre to provide an alternative analytic paradigm. As the MIIT can connect many things to Internet and helps construct new organizational and social structures which can empower (allowing people to do something, like promoting the borderless workforce) and enslave (forcing people to do something, like monitoring remote workers) individuals connected to the Internet (Jarvenpaa & Lang, 2005), and this paradox phenomenon can be metaphorically akin to a drama wherein all actors have to follow the planned script (being enslaved) and are still able to improvise (being empowered). Therefore, it is reasonable to use the theory to analyze some factors and impact mechanisms of the MIIT, which contributes to explaining human relationship and digital personhood in a digitalized world (Kerrigan & Hart, 2016).

## 3. RESEARCH METHODOLOGY

The research objective is to explore and analyze the effects of the MIIT on community management. First, each community as a basic unit of society is quite heterogeneous because of many objective factors, such as geography, history, structure, politics, population, economy, and religion, etc. When it comes to hybridizing new technology and heterogeneous communities, the case study is a suitable research method. Second, community management is a local-focused managerial context and heavily relies on community residents and local social workers, so the successful application of MIIT cannot be isolated from this context and community members. The case study method can historically and specifically decipher a business story and put the story into a realistic, social, technological, and managerial context. Last but not least, it is wiser to choose a case study method when research targets need to be studied in the daily context (Yin, 2008). Hence, a Social Grid Management Project (SGMP) in a China's medium-sized city was used as the case to execute this study. The reasons of choosing this project are: 1) the project is a MIIT-based technological innovation project in domain of community management, which is congruent with this paper's research purpose; 2) the city's economic environment is relatively stable and medium between all cities in China, hence this is very helpful to alleviate the effects from external nuisance factors; 3) the municipal leaders had formally committed that this project was going to be one of the most important strategic projects in 2012 (the starting point of this study), and this leadership commitment can largely increase this case's credibility.

Eisenhardt and Graebner (2007) stated that the case study method is an objective and appropriate methodology which is more congruent with reality. They divided case studies into two classes: phenomenon-driven research and theory-driven research. The paper adopted the latter one. Literally, this case study used the Dramaturgical Theory to drive the case analysis and discussion.

### 3.1. Case Study

The project's main objectives are: 1) to build a quick-responsive emergency management mechanism; 2) to establish an agile public service system; 3) to enhance residents' experience of using public services (social insurance, community security, birth control, and etc.). In 2012, the city council employed 687 grid managers who are mostly university graduates. Each grid manager is responsible for a community of 300-400 residents. In July 2014, the first round of data input enabled grid managers to legally access residents' private information (e.g. demographics). As the administrative organization of all grid managers, the Grid Management Centre (GMC), can track grid managers' location and collect their online work flows by using this system.

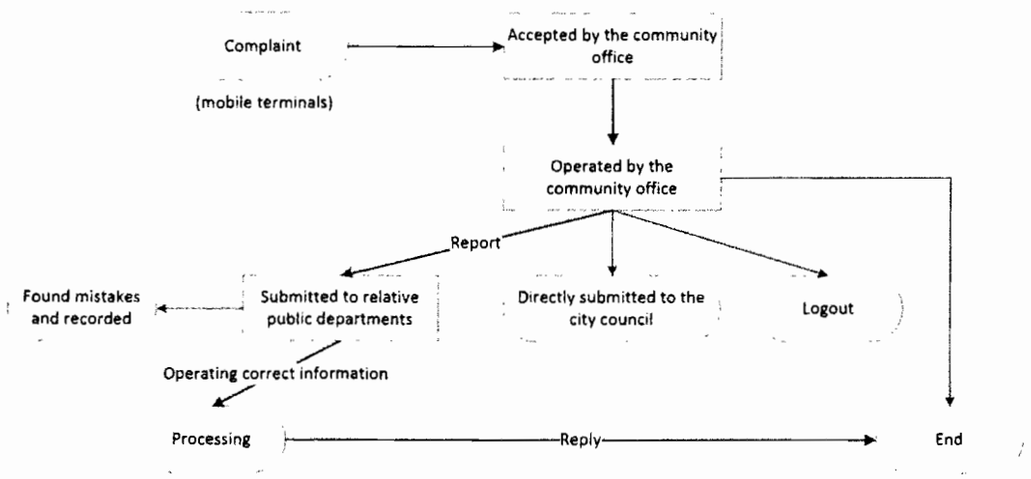
Many official documents, newspaper stories, local electronic literatures, interviews about various aspects of this project were collected for this case study. Three communities were especially selected to observe the effects of MIIT.

In the first research phase, a researcher had been working as a grid manager in these three communities for a total of 17 months (from October 1st, 2012 to May 31st, 2014). He had to complete a daily report about what happened in his community. The researcher's responsibility is managing the community, communicating with local residents, and using mobile handle devices to report residents' complaints and inquiries. His high involvement in the public project made himself trusted by local people. It is also convenient for him to know both formal and informal information and implicit knowledge about this case.

In the second research phase, researchers shifted their attention from the field work to the overall view of the project. Additionally, they paid more attention to communicate with top managers in the city council and gather general information from mass media and "audience".

Figure 1 shows the information flow begins with a complaint and ends with different results. This figure can help understand the overall working mechanism of this system. The MIIT works as an instant and convenient information vehicle to improve the information communication between residents, grid managers, and public service departments. This work flow design has also determined the critical role of grid managers in this project. The project performance relies on how grid managers identify and exploit potential opportunities of improving community life, community management and community security so as to generate a sustainable and agile service mechanism. This information flow also depicts how residents put their private, independent and individual community lives into a transparent, visible and public field, and finally finish the "social referral" process through this

**Figure 1. The work flow of the management information system**






information system. It is common knowledge that Chinese culture has the propensity to keep a harmonious relationship with the surrounding environment and stay in peaceful harbor rather than face social conflicts, but the successful operation of this information system needs community members to proactively participate in the process of identifying these social conflicts and problems, so how this new technology "intrudes" into people's daily life and affects the whole community becomes much more interesting.

The information system is mainly manipulated by grid managers, and social workers who work in the local community. Hence, a historical view may help us to describe how the MIIT "intruded" into community management. Table 1 shows all leading policies during the observational period. As it is shown in Table 1, the "intrusion" of the new MIIT cannot be separated from grid managers, existing organizational information resource, the authorization and institutionalization from the city council and the GMC. The intrusion process of MIIT on community management has an evolutionary, dynamic and social process.

## 4. FINDINGS AND RESULTS

During the research in the case, a wide array of materials and documents were used, collected, and analyzed at Jilin University School of Management. The research team designed a few specific categories to demonstrate the research findings:

**Table 1. The leading policies**

| No. | Policy | Timing | Event | Result |
|---|---|---|---|---|
| 1 | Recruiting grid managers | 24/5/2012 Present | 687 grid managers recruited | 99% of vacancies are filled |
| 2 | First round data input | 01/11/2012 31/11/2012 | Existing resident information were input into the information system | 95% of all population data was input into the system |
| 3 | Forming an initial grid organization | 15/11/2012 31/11/2012 | Organization development and formation | Different grid managers have different performances. |
| 4 | Ice breaking | 01/12/2012 31/01/2013 | Grid managers tried to build primary social relationships with local residents | Different grid managers left different impressions |
| 5 | Few services are put into operation first as experiments | 01/11/2012 31/09/2013 | Grid managers are authorized to serve residents | Different community council treats grid managers differently |
| 6 | Officially announce 6 kinds of fundamental services could be provided by grid managers | 01/10/2013 Present | The municipal leader made an official speech to the press | Grid managers finally are legalized and have independent offices, and information system are formally taken as a key complementary channel to deliver service |
| 7 | Second round data input | 31/02/2014 31/05/2014 | Grid managers tried to collect and update each resident's information | 90% of population information was updated |
| 8 | Officially announce 48 kinds of services could be offered by grid managers | 26/04/2014 Present | The local press printed the policy and the service system enabled by MIIT is finally legalized | Grid managers are fully responsible for those services |

1. What cost time and money to implement the project was not people's/audience's acceptance of the new MIIT, but people's/audience's trust in the new grid manager. In other words, the effects of MIIT are largely derived from "the materialized actors in this drama". Despite the fact that all grid managers were officially authorized by the city council to gather information from residents, most residents were still unwilling to share their information with them, even though they knew this job will contribute to the improvement and development of the local community. Consequently, distrust made many people have a doubt about the legitimacy of the newly-born gird organization. In order to relieve the tension, the city council carried out a genius organizational design to make all gird managers institutionally belong to each local neighborhood council or community council. Therefore, as a transferable and sharable resource, trust drove residents to share their information for "helping old friends and making new friends";
2. What motivated the neighborhood council and relative public departments was not the new technology-based innovative service system or "the idealized script", but the city council's sustainable strategic focus and resource investments on these new grid organizations. According to the feedback from the three communities, it was painstaking for grid managers to collect renewable information and cope with emerging social problems by the new information system during the observational period. However, these people were still willing to accept all policies and orders from the GMC and the city council. This is akin to those key projects launched by government. The grid managers' proactive use of the MIIT is not only about seeking more resource and investments but also attracting enough attention from city council -- "the most valuable audience", otherwise it is meaningless for these organizations and individuals to invest so much time and energy to implement all project plans. In an extent, MIIT has a symbolizing effect on community management than works as a technological innovation vehicle;
3. What encouraged the city council was not the MIIT itself, but its demonstrating effect for the municipal government to mobilize more political resource. Given all technological advantages provided by MIIT, the city council wants to build a systematic mobile government platform based on MIIT. The MIIT-based technological innovation practice could be a perfect "eye-catching drama" in China and tag the city as one of leading executors of China's national "Internet+" strategy. As a result, this city has been one of benchmarks for other municipal governments in the trend of service digitalization;
4. What drove university graduates to be a grid manager was not the prospect of the MIIT, but the promising future of a new career barely offered by other cities (the job was extraordinary in 2012, but now is quite ordinary in many other cities). Although it is complicated to explain why they chose such a job, few respondents said they chose the job due to the new mobile technology. More of them said the "spotlighting" effect of MIIT helped them make the choice. Nevertheless, the average turnover rate of each community had been gradually increased to 34% when the local society and government dampened their enthusiasm in this project in mid-2014. In other word, when the new technological innovation business lost the "spotlighting" effect and the city council shifted their focus from new technology initiation to daily maintenance, actors' enthusiasm then fell away;
5. What changed the management and governance of local communities was not MIIT itself, but the authorization and institutionalization from the city council and the GMC. Grid managers are employees of the GMC, but they have to work remotely in a various array of communities in this city, so the MIIT was introduced to monitor and surveil these remote workers' behavior and performance. The role of MIIT is critical because the high probability of "being caught" doing something against "the script" when under the "stare" of GMC's intelligent information system prevents those managers from misbehaving. However, most misbehaved grid managers seldom got punished even though the intelligent surveillance tool found and reported the fact. It seems that remote controlling is technically viable though, the GMC's technology fascination has been largely weakened because community management affairs such as coordinating family conflicts,

Journal of Global Information Management
Volume 26 • Issue 2 • April-June 2018

dismantling illegal buildings, increasing community security, and constructing community culture which heavily rely on grid managers' cooperation with the local community members, i.e. residents, social workers, small business owners, volunteers. In a word, the inevitable localization and materialization of actors has dramatically alleviated the surveillance effect or the "marionette effect" of MIIT.

In summary, from a dramaturgical perspective, the MIIT has dynamic, social, and complicated effects which are largely derived from the materialization of actors in this drama. These effects, except the surveillance one, are social consequences of human interaction and significant in the collective meaning-giving processes. The surveillance effect is a typical technical effect but has to be alleviated due to the local-focused managerial characteristic of community management.

## 5. DISCUSSIONS

The MIIT was regarded as an evolutionary and disruptive technology for the local community management. This case study indicated that many technological elements seemed to be contributing factors in this project, but actually more social, managerial and political factors were determining the success of this project. The Dramaturgical Theory can be used to metaphorize these factors to analyze the effects of MIIT.

Society is considered as a stage by dramaturgy. Thus, all people are actors who want to perform the play well to impress audience. Goffman (1959) stated that the incentive to make a social contact is a typical behavioral choice of impression management. As a newly-born technology, technology sponsors, users, and administrators need to leave a good impression to get supporting strategies from the city council and "sell out the drama tickets" to get enough audience.

Actors will not absolutely play as the script. In this project, the GMC did not fully utilize all technical advantages provided by MIIT, such as location-aware computing, Just-In-Time service, and deep data-mining. The changes in the project plan (script) were inevitable because remote workers had to cooperate with local community members and needed to contingently respond to orders and strategies from the GMC, since the GMC cannot fully foresee all repercussions of its intervention on local communities.

The stage can largely influence actors' behavior pattern. For example, a couple is quarrelling at home, but they will look like quite harmonious when a guest is visiting them. This is the big difference between in-the-front-stage and in-the-back-stage. As mentioned before, funded by the city council, the project is a strategic government investment. Taxpayers or audience cannot tolerate any failure of this public project. Thus, this project's outcomes are inevitable to be made up so that "the drama" seems to be "fabulous" in the front stage and that largely explains why the symbolizing effect, demonstrating effect, and "spotlighting" effect of MIIT are significant.

Dramaturgy can reveal what factors actually dominate the digitalized society. Based on a dramaturgical perspective, the role of MIIT on community management could be understood as "a political prop". The metaphorical use of theatre indicates that props are perhaps important but far from prerequisite. Till now, many Chinese cities do not introduce MIIT into social governance yet, but these cities can still tackle emerging social problems well.

For almost all audience (residents, the municipal government, taxpayers, and mass media) of this case, the idealized script should be like this: many social problems and conflicts could not be identified and ex ante eliminated before the introduction of the new MIIT, and then when the city council initiated the project, these problems could be "dramatically" solved by the new information system. Hence the effects of the MIIT in dramatically increasing service efficiency of would be significant only if the public service model was actually changed as the script. Unfortunately, till the end of the observational period the authors did not see a significant change in the model but saw a considerable rise in the number of news stories and policy documents which is a main means to

help audience "watch" the play rather than "enjoy" the play. The new mobile-based service business was just embedded into the existing service framework as a secondary or complementary role in the overall service model. In theory, MIIT should be enough to allow grid mangers to take more dispositive responsibilities in community management. However, according to the feedback from the three communities, most grid managers preferred to allocate their public service resource for several specific areas and particular resident groups, but this problem could have been solved by the MIIT. The MIIT constructed a "technical panopticon" wherein all grid managers are monitored by the GMC. The surveillance of remote workers means that all grid managers' "working footprint" can be saved, retrieved, and referred to the administrative organization and then administrators can manage and control grid managers' misbehavior. Many factors could result in the alleviation of the surveillance effect. Organization strategies, routines and structures (working like "scene environment") can materialize people's perception about what the MIIT should actually be and how it works in a local community. For example, many residents in this case just cannot believe that government would send grid managers to offer door-to-door service because many of them have been accustomed to visiting bureaucratic offices in person. Additionally, some incumbent social workers were worried about losing jobs due to their fear and weakness in using the new technology and then resisted the whole service model. The MIIT was used by grid organizations to realize technological innovation and change organizational routines and structures, but eventually it was shaped by them, so this new technology became more symbolic and political.

## 6. CONCLUSION

In the context of social governance, the analytic paradigm based on the Dramaturgical Theory helps us find the effects of MIIT on community management. This study found that the MIIT was used by grid organizations to realize technological innovation and change organizational routines and structures, but eventually it was shaped by them, so this new technology was only able to embed itself into the public service model as a secondary or complementary role.

Dramaturgy can be employed to understand technological innovation activities such as the use of MIIT. The original and idealized script has to adjust itself to be a coherent scenario in order to adapt to the scene environment. A quantitative approach, combined with a research focus on the embeddedness of MIIT in public organizations, organizational factors (such as memories, strategies, and routines), and people's preferences is thus suggested to further examine and testify the effects of MIIT on community management and social governance.

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Journal of Global Information Management
Volume 26 • Issue 2 • April-June 2018

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*Wan Su, MSc in Management, and PhD in Management Science and Engineering from Jilin University, is a lecturer of Management Science and Engineering at Jilin University (China). She has been a visiting researcher at University of Massachusetts (USA). Dr. Su's expertise includes Internet innovation and entrepreneurship, social media marketing, mobile payment methods, and Internet of Things. Her published work focuses on Internet innovation and entrepreneurship, online community issues, knowledge sharing, information fusion, social media marketing and business model innovation. Her research work has been published or in forthcoming in many refereed journals and conference proceedings including Information Technology & Management.*

*Xiaobo Xu is a Professor of Management Information Systems at the American University of Sharjah, United Arab Emirates. He received his BE in Management Engineering from East China University of Science and Technology and his PhD in Management Information Systems from the University of Mississippi. His primary research interests include information systems project success, business model innovation, research methodologies, e-commerce success, etc. His published articles appear in Project Management Journal, Information Technology & Management, Information Systems Frontiers, International Journal of Information Management, and Internet Research among others.*

*Yangchun Li is a PhD candidate in Electronic Commerce and Strategic Management at the Department of Business Administration, University of Granada (Spain). He received a BA in Business Administration from Wuhan Polytechnic University (China), and his MSc in Management Science and Engineering from Jilin University (China). His research focuses on the ways in which information and communication technologies structure and extend human interaction, with particular emphasis on the effects of mobile technology, social media, and Internet of Things. He has also published work examining the impact of information technology on user behavior, and on the transformational changes brought about by emerging information and communication technologies.*

*Francisco J. Martínez-López, MSc in Marketing, and European PhD in Business Administration (2005), with Extraordinary Doctoral Prize, from the University of Granada (Spain), is Professor of Business Administration at the University of Granada (Spain) and Guest Researcher at EAE Business School (Barcelona, Spain). He is the Associate Editor of the European Journal of Marketing (Emerald) and belongs to the Editorial Board of Industrial Marketing Management (Elsevier). Dr. Martínez-López has extensively published in international journals, such as Journal of Retailing, Int. J. of Management Reviews, Industrial Marketing Management, Internet Research, Electronic Commerce and Research Applications, Journal of Business Research, Information Systems, Expert Systems with Applications, Journal of Small Business Management, Journal of Marketing Theory and Practice, European Journal of Marketing, Journal of Retailing and Consumer Services, Computers & Education, Int. Journal of Market Research, and Computers & Human Behaviour, among others.*

*Ling Li is the Chair of the Department of Information Technology and Decision Sciences, Coordinator of Maritime and Supply Chain Management discipline at Strome College of Business, Old Dominion University, USA. She is university professor and a fellow of APICS (the Association for Operations Management). In tribute to her research records, she was awarded the title of Eminent Scholar. She has published over 100 peer-refereed research articles in high quality journals, three single-authored books on supply chain management and logistics, encyclopedia articles, business cases, conference proceeding papers, and book chapters. She is the winner of many awards. She serves as the First Secretary (officer) of International Federation for Information Processing TC8 WG 8.9, an organization which is under the auspices of UNESCO. She is Area Editor of Systems Research and Behavioral Science Journal, Associate Editor of Journal of Management Analytics, and an Editorial Board Member of International Journal of Integrated Supply Management.*