Using a Design Science Approach to Create and Evaluate a Social Media Crime Reporting Tool in a Developing Country: Case Jamaica

Research-in-Progress

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ABSTRACT

Latin America and Caribbean countries account for a considerable percentage of the homicide rate globally. The level of crime in this region has had a negative effect on growth and development. We posit that the use of social media as a crime reporting tool could have a positive impact in these economies. Therefore the purpose of this research is to use design science to create a social media crime reporting tool to be implemented in Jamaica. Over a period of eighteen months the research and development team engaged with members of the Jamaica Constabulary Force (JCF) to assess design requirements for this artifact. We present the preliminary results from the first interaction of the design cycle, which suggest that privacy and security risks, protecting the identity of informants, verifying evidence submission and reconciling Jamaica's legislation with the use of the artifact are major concerns for members of the JCF.

Keywords

Social Media, Crime Reporting, Design Science, Developing Countries

INTRODUCTION

The impact of social networks on the way humans communicate is immeasurable (Ashur & Huberman, 2010; Pepper, 2012; Wellman, 2001). Increasingly, in the age of information and communication technologies, more people are connecting virtually rather than coming together in a physical space (Wellman 2002). Social networks have transformed the way people communicate and, in the area of crime reporting, have facilitated communication between friends and neighbors without them having to come together for formal meetings (Demoss, 2011). The explosion of social networking sites has not only changed the way we communicate but also the way we practice law (Olson & Wills, 2010). Law enforcement encourages social networking for crime reporting and welcomes the opportunity to monitor and review information that is gathered online and to collate the results of several social media interaction (Demoss, 2011; Slessor, 2011). It also gives law enforcement agencies a peculiar opportunity to respond strategically and proactively (Olson & Wills, 2010).

In this globalized economy, crime and violence is very topical and even more so for developing countries (DC). In Latin America and the Caribbean 350 people are murdered daily with the region accounting for over 27% of all homicides that are recorded around the world; yet the region has only 8.5 % of the world's population (United Nation, 2012). More pointedly, within the Jamaican economy, murder and other violent crimes constitute one of the greatest social problems that the country faces today (Jaffes, 2012). In 2008, crime and violence ranked in the top two most serious problems threatening the country's economic recovery strategy (Clayton, 2012). Over the past two decades Jamaica has experience an unparallel increase in homicides and violent assaults (Harriott, 2003). The high cost of crime is a serious barrier to investment and competitiveness in the economy especially for the tourism and manufacturing sector (Sullivan, 2010).   The reduction of crime in any society may result in positive gains economically. The purpose of this research, therefore, is to utilize a design science approach to create a social networking crime reporting service in Jamaica and to implement and evaluate this tool as a crime-fighting aid for the local police force.

Design science may constitute technology-based design of an innovative artifact, such as a construct, model, method, or instantiation (Nebeling, 2007). It is a technology-oriented paradigm that has its roots in engineering and the sciences (Nugrahanto & Morrison, 2008). Whereas natural science promotes the understanding of reality, design science attempts to create things to meet certain desired goals (Nugrahanto & Morrison, 2008). The products of design science are assessed against the criteria of value or utility: Does it work? Is it an improvement? Nugrahanto and Morrison (2008) explained that generally accepted activities in design science are: Build and evaluate. Build is the process of constructing an artifact to meet specific goals while evaluating concerns with how well the artifact achieves the purpose. In this paper, we present the preliminary results of the creation of the artifact (social media crime reporting tool) with the intent to conduct subsequent evaluation in future research. In the proceeding sections we outline the significance of the study followed by an evaluation of crime facing the Caribbean. Next we examine the application of social media as a crime-fighting tool in different economies followed by the presentation of the artifact and the results of the preliminary evaluation.

SIGNIFICANCE

DC account for the majority of the world's population (Walsham, Robey & Sahay, 2007). The assimilation of DC in the global marketplace has often been considered a primary force behind the poverty reduction trends and general increases in wellbeing in many emerging markets (DeMaagd, 2009). For a variety, of reasons DC are important on a global scale, yet they are not well represented in the academic literature (Walsham et al., 2007), particularly in the reflection of aiding their development and providing solutions to their social problems. Bearing this in mind it is important for us to examine and assess ICT development in these countries. In the editor's comment on a special issue in the MIS Quarterly Journal, Saunders (2007) emphasized the need to examine research in DC, she indicated that information Systems (IS) researchers have voiced their concerns that many IS journals hardly publish research about DC and when they do the numbers of publications are limited. These concerns underscore the need for a study of this nature.

An important issue for both practitioners and information systems scholars is improving and ensuring the practical relevance of research while employing and maintaining a rigorous research approach to generate new theoretical insights and add to our understanding of a particular phenomenon (Straub & Ang 2011). Design science is a paradigm that addresses the issues of both practical relevance and theoretical contribution (Gaß, Koppenhagen, Biegel, Maedche & Müller, 2012). However anecdotal evidence suggests that despite the publication of several studies that discuss the theoretical underpinnings of design science there is a paucity of publication demonstrating a practical application of the paradigm. Therefore this study seeks to address the paucity of research in the application of the design science paradigm in creating artifacts with practical relevance. Additionally, the academic literature appears deficient in the coverage of social media for the solution of practical problems such as crime fighting within marginalized groups and developing nations.

The design artifact at the core of this research is a social media crime-reporting tool, which is created in response to the battle against the current state of crime and violence in the Jamaican society. Jamaica's National Security Policy outlined that a reduction in crime will help to establish a safer and a more secure environment in which all Jamaicans can enjoy a better quality of life and realize their full potential (Sullivan, 2010). In support of this goal, we seek to create an artifact that can help to facilitate an environment in which citizens maintain anonymity in crime reporting while working towards a greater good. We hope that this study will have national and regional implications for the Caribbean and Latin American. We hope that the findings will contribute useful insights towards the introduction of a new approach to crime reporting and to assist the law enforcement agencies and prosecutors overall crime fighting efforts.

PROBLEM OF CRIME FACING THE CARIBBEAN

The extremely high homicide rate in the Caribbean has stunted economic growth and development and has driven potential investors from the region (Brathwaite, 2011). This has far reaching implications for these countries as the Gross Domestic Product (GDP) declines between one and two percent annually as a direct result of this prevailing crime problem (Brathwaite, 2011). The cost of crime in Jamaica alone is estimated to be US$529 million annually (United Nation, 2012). A World Development report estimates that the direct and indirect cost of violent crime in Jamaica is more than US$400 million (J$34 billion) annually (PSOJ, 2010). By global standards the murder rate is considered high and it is imperative that this trend be reversed in the Caribbean (UNDP, 2012). Governments must strengthen public institutions to tackle crime and violence and improve preventive measures (UNDP, 2012). Social cohesiveness is negatively affected by crime and estimates provided by the Caribbean community reveals that gang related crimes cost the region between 2.8 and 4 percent of GDP (United Nation, 2012). The high levels of crime and the insecurity that is has caused has had a damaging effect on business and investment and could considerably impede development (UNDP, 2012).

Jamaica

Jamaica is the largest island in the English speaking Caribbean. Data from the statistical Institute of Jamaica indicates that at the end of 2011 there were 2,709,300 persons living on the island (encyclopedia of nations, 2012). In 2011 the total number of murders in Jamaica stood at 1,124 which, the security minister acknowledged as a significant decline in comparison to previous years. In spite of this recent reduction, the country still has the highest homicide rate in the Caribbean region and the third highest in the world, with an average of 60 persons being killed per 100,000 inhabitants (United Nation, 2012). Many persons in Jamaica have lost trust and loathe confiding in anyone to report crime (Anglin-Christie, 2006). The recent increase in reports of alleged police brutality and corruption has added to this resentment of people readily reporting crime (Harrison, 2011). The strengthening of relationships between residents and law enforcement agencies such as the police and the army can promote trust and also indicate the commitment of the institution to the community (Barton, Blenker, Smith & Speck, 2012). Crime is not only costing lives and money but it is eroding the quality-of-life of all Jamaicans (PSOJ, 2011).

Over the last three decades, the World Economic Forum has produced an annual report on global competitiveness. The intent of the report is to provide insight and stimulate discussion among all stakeholders about the best strategies and policies to overcome the obstacles to improved competition. Interestingly, the report also examines inhibitors to global competitiveness which includes measures of corruption among other things. An examination of Jamaica's performance on the World Economic Forum 2011/12 competitiveness index revealed that out of 132 countries Jamaica ranked 74th on corruption; 130th on business cost of crime and violence; was placed 93rd as it relates to reliability of police services and 60th as it pertains to undue influence on the regulatory framework of businesses (Lawrence, Hanouz & Doherty, 2012). An empirical analysis of corruption in Jamaica suggested that most Jamaicans believed that corruption was prevalent in all government institutions but more so in the customs department, police force and the parish council offices (Waller, Bourne, Minto & Rapley, 2007). The study also revealed that the preponderance of the respondents strongly believed that the anti-corruption rules are adequate, but government agencies are too weak to enforce them and in many cases they are intentionally not implemented.

Jamaica's desolate performance on corruption, as listed in the Global Competitiveness report 2011/12 and the empirical analysis of the research conducted by Waller et al. (2007) are indicative of a nation fighting an uphill battle against corruption. It is important to note that as a start to battling corruption citizens must have access to public information in order for democracy to function. Access to information concerning governance of the state allows individuals to exercise their political and civil rights in election processes (Heeks, 2007). Persons are also able to challenge or influence public policies, monitor the quality of public spending and demand accountability (Heeks, 2007). Access to information and transparency are thus prerequisites for democracy as well as a key tool in the fight against corruption. Civil society organizations in DC should demand greater transparency as a key component in fighting corruption and empowering people living in poverty (Ojha, Palvia2 & Gupta, 2008). Increased transparency is often dependent on political will; however, when governments do not have the capacity and/or the will to launch administrative reforms in order to remove the opportunities for corruption, adding external pressure on officials by increasing the risk of exposure presents a workable alternative (Prasad, 2012). The use of information and communication technologies (ICT) is a viable approach to adding external pressures to political officials and government agencies in the fight against corruption. Undoubtedly, technology possesses the characteristics of digital footprints and encourages accountability through audits (Prasad, 2012).

SOCIAL MEDIA AND LAW ENFORCEMENT

With an increase in the demand for governments to share information that will enhance public safety and assist in policing, there is a push for governments to adapt the use of social media (Daley & Slessor, 2011). Today many law enforcement agencies (mainly police forces and public safety agencies) are recognizing that social media is much more than online chat or dialogue but it is a means to facilitate quick response and improve the quality of data acquired (Daley & Slessor, 2011). In today's society the use of social media and various communication technologies (mobile devices, tablets etc.) present an opportunity for the compression of response time of the police and to change what we have come to know and accept as policing strategy and response (Daley & Slessor, 2011). According to Johnson and Reitzel (2011) the challenges that the police face in this crowded information landscape brings into focus the need to incorporate social networking in their operation. Social media provides a medium for law enforcement agents to reach out to the community (Wellman, 2012). According to Olson and Wills (2010) in this the era of social networking it would be indolent if prosecutors and law enforcement officers are not familiar with or utilizing social networks in the cases they investigate and prosecute. Social networking sites can help the investigator to quickly understand the suspect's or victim's likes and dislikes and provides investigators with quick clues as to how to approach an interview (Olson & Wills, 2010). Social networks can be used as strategic tools and in proactive response in the area of traffic crimes by preventing large organized underage drinking parties which are usually broadcast on these networks (Olson & Wills, 2010). Daley and Slessor (2011) pointed out that it has become necessary for prosecutors, law enforcement agencies ,victims and witnesses alike to be aware of the possible benefits

and dangers of social networks and how they can be used as prosecutorial tools (Olson & Wills, 2010). Crime fighters should understand the benefits that can be derived from the use of social media and the level of creativity that can be added to crime fighting efforts and incorporate these in the formulation of crime fighting strategies (Daley and Slessor, 2011).

Diversification of the media available for reporting criminal offences can help in the thrust against crime as criminals have now become very sophisticated in their behavior (Choo & Smith, 2007). Poturalski (2010) reported that in the five days after posting photographs of wanted persons on a Facebook page, the Hamilton police in Ohio received a tip that led to the arrest of the suspect. Poturalski (2010) asserted that an increased number of law enforcement agencies in the United States (US) are using social networking sites to help with solving crime. According to Sgt Craig Bucheit of the Hamilton Police Department the greater segment of the community is online on social networking sites and there is a need to capitalize on that trend and the audience (Poturalski, 2010).

Meyer-Gossner (2011) explained that as social media takes a hold on society, officials now have a new tool in crime fighting, as a result of increased connections through online forums. The 'Hampshire Constabulary 101' crime reporting social website in England has also reported improvement in the commitment in working for safer communities (Basu, 2012). In Canada, a Toronto constable Scott Mills used Twitter, YouTube and Facebook to appeal to witnesses and to track down perpetrators, he is regarded as a pioneer in law enforcement for his ability to incorporate social media in crime fighting (Divon, 2011). Similar efforts have been noted in Mexico where the website 'Mi Panama Transparent' was set up to track crime and corruption information from its citizens (Sieera, 2011). Olson and Wills (2010) also noted that the Boise Police department maintains a Facebook, Twitter and YouTube account to help foster a positive relationship with the media. This allows them to follow breaking news, to be more proactive and to maintain positive communication with the public. Likewise, the Sarnia police have also invested time in keeping social media as a crime fighting tool.

DESIGNING AND EVALUATING THE ARTIFACT

In this study, we utilize a design science approach based on the work of Hevner et al. (2004) in the creation and evaluation of the artifact (InI Chat). According to Hevner et al. design science is a problem solving paradigm which seeks to create innovations that define the ideas, practices, technical capabilities and products through which the analysis, design implementation and use of the information system can be effectively achieved. Further, Hevner (2007) asserted that at the core of any design science research project is an internal design cycle (see figure 1). The Design Cycle iterates between the activities involved in building and evaluating the artifact and the processes of research. The design cycle creates design alternatives against requirements until a satisfactory design is reach. In our findings we present the results of the first iteration of the design cycle for the creation of InI Crime chat. Over a period of eighteen months the research and development team consisting of two of the authors as facilitators and four software developers engaged with members of the Jamaica Constabulary Force (JCF) to assess preliminary design requirements for the artifact.

The artifact was built using object oriented programming paradigms using open source software. The programming languages that the development team used to build the application include PHP, Hypertext Markup Language (HTML) and JavaScript. Cascading Style Sheets (CSS) was used for the interface of the website and Adobe Photoshop CS5 for image design manipulation. The team used NetBeans version 6.9.1 Integrated Development Environment (IDE) to write, debug and compile the code. Windows Apache MySQL PHP (WAMP) server version 2.2 was used to host the website. Along with several loaded extensions, WAMP was configured with Apache HTTP web server version 2.2.22, MySQL version 5.5.24 as the relational database management system and PHP version 5.4.3
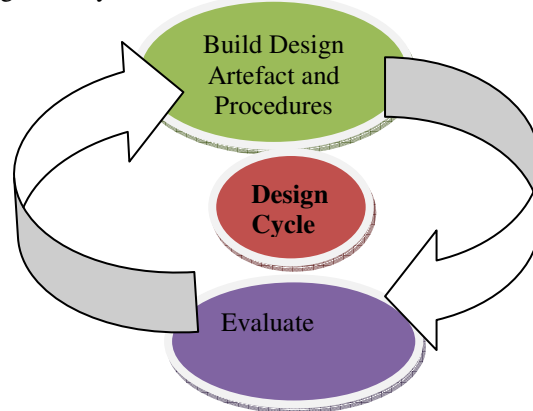

Figure1. Design Cycle Adapted from Hevner (2007)

First Design Cycle Iteration

The artifact contains features such as an instant chat, file uploads and discussion forums. The application was created for a client server environment. The home page for the crime-reporting tool is depicted below (see Figure two). Users may click on any of the links to navigate the site.

Figure 2. InI Crime Chat Home page

In navigating through the system users must first enter their account information to gain access. When the user logs on to InI Chat there is a link to the left of the screen that allows them to report a crime and submit the report. Figure two shows the report a crime page for the end user. On this page the user can enter details of a crime that he or she has witnessed and upload any supporting evidence (see Figure3).

Figure 3. InI Crime Chat Report page with form reporting feature

One of the features of InI Chat is the facilitation of blogs on a public messaging board. This feature allows users to participate in various discussions and topics of interest (see Figure4)
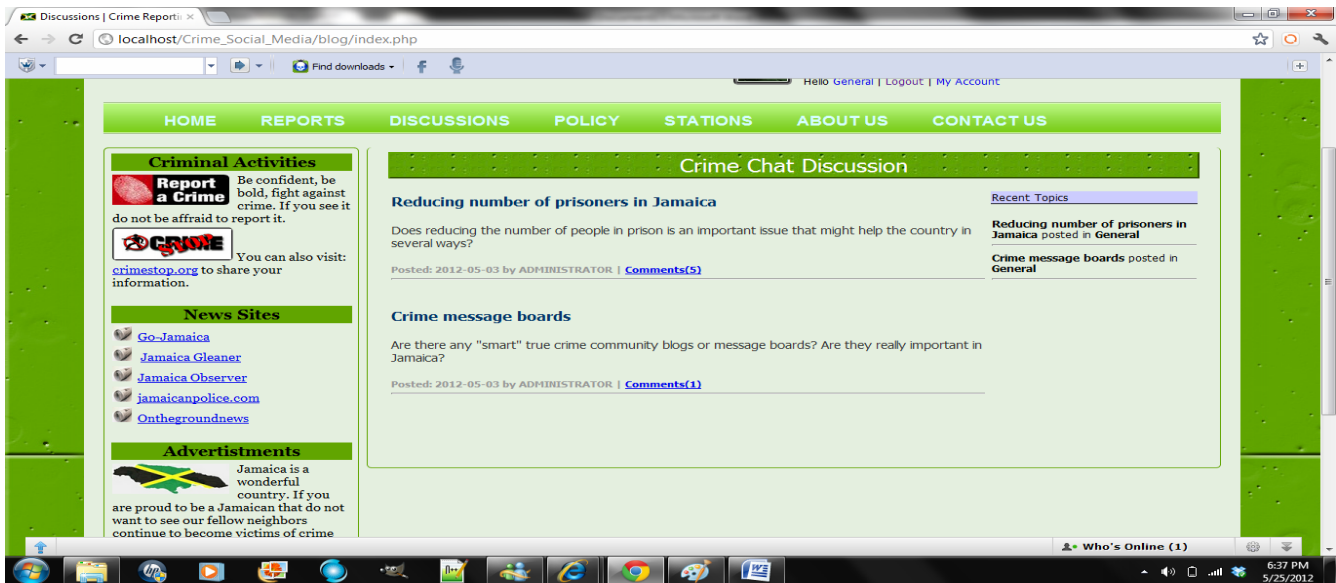

Figure 4. InI Crime Chat Blog page for discussion

There is also an instant messaging chat feature which allows users interact with each other chat and also chat with the system administrator privately (see Figure5).

Figure 5. Report page with Chat feature

PRELIMINARY EVALUATION OF THE ARTIFACT

A qualitative approach was used in the evaluation of the artifact. A series of interviews were conducted with members of the Jamaica Constabulary Force to assess their feedback on InI Chat. Participants were allowed to use the InI Chat application and were then interviewed on their perception of its utility. The interviews lasted for an average of twenty minutes and were taped. In the interest of protecting the identity of the participants all names have been changed. A summary of the interviews is depicted in Table1.

Table1. Preliminary Evaluation of the artifact by Jamaica Constabulary Force Members

Areas of concern	Feedback of evaluators
Privacy issues and protecting the identity of informants	• *What would happen if a person goes on to make a report in the case of a murder? How many persons would be privy to the information? Owing to the fact that we have actually many rogues among us that are actually a part of the crime. How would you protect that information-* **DSP Francis** • *There needs to be secure browsing for the network connectivity-* **DSP Black** • *The identity of informants must be kept a secret-***DSP Black, DSP Wilson**
Interaction tool	• *Not a crime solving tool but an interaction tool with the general public, to keep in touch with the wider community to help them protect themselves etc* **DSP Wilson** • *Good opportunity to get feedback from the general public -* **DSP Wilson** • *Will the artifact be used for intelligence purpose, to highlight crimes or solicit feedback* **DSP Thompson**
General Acceptance of the Artifact	• *Need to know how the wider community feels about the artifact. How much participation is anticipated from the wider community? Hope persons would actually take advantage of the network so that the police will get something out of the process-* **DSP Francis** • *This form of information gathering will always be welcome by the JCF as they are willing to try many different things to garner intelligence for the furtherance of*

	apprehending criminals. The support of the citizens and the community is integral especially in areas where violent crimes are committed - **DSP Francis**
	• *A suggestion for doing the survey is to collaborate with the police and see which areas are more prone to crime and violence and do surveys in those areas. Some of the challenges they are having is that people see that crimes are committed and they know but they are unwilling to come forward-* **DSP Francis**
	• *Necessary to seek by-in from the CIB head quarters* -**DSP Thompson**
Helpful	• *It would be helpful in assisting the JCF complete its job* -**DSP Thompson**
	• *Good concept to get younger people to participate in crime reporting. Jamaican people are inquisitive* **DSP Black**
	• *At a Glance it is cool I like the concept of the online chat I like the whole interface –* **DSP Young**
Verifying evidence submission	• *Persons may not think before they upload information* **DSP Black**
Legislative issues	• *Will the Jamaican legislation support accepting crime reporting from this medium. If you report a crime in this media you may not be able to go forward with it beyond the report in terms of prosecuting anybody.* - **DSP Wilson**
	• *The pictures of wanted persons could not be posted on the site that would not fit into the constitution. You would have to creates links with the JDF website* - **DSP Young**
Interface	• *As it related to the colors you will need to take out the green and orange and make the look and feel neutral using colors such as blue or white –* **DSP Young**
	• *We don't want the site to be politically affiliated with any party wouldn't want persons saying what kind of labourite site is this-* **DSP Young**
	• *Keep the flag but change other colors-* **DSP Young**
	• *The interface must clearly indicate what are the guidelines and conditions associated with using the InI Chat-* **DSP James**

CONCLUSION

The evaluation of the artifact yielded many interesting results that the team had not initially considered. For example, we did not anticipate any negative political reactions to our use of the colors of the Jamaican flag as the backdrop for the webpage design. Considering that green is the color used by a major political party we were advised to change the color used. With this in mind we have decided to revisit the design to select colors that are considered neutral in order to eliminate any foreseeable bias that may unintentionally impact the result. In general the reaction of the members of the police force suggests that their overall evaluation of the artifact is to have it implemented as a citizen to police relationship building tool. It is also apparent that the laws in Jamaica is logging behind the technological advancements. Most importantly securing the information provided by citizens in INI Chat is at the core of the major concerns of the force. The interviews also emphasized the need for general buy-in from the public, bearing this in mind the next phase - the evaluation- will include a survey to determine potential adoption from the Jamaican public. In going forward, the team intends to use the results of the feedback from the Jamaica Constabulary Force to refine the artifact with the intention to subject it to rigorous evaluation and the dissemination of the results.

REFERENCES

1. Anglin-Christie, K (2006) Records Advocates Violence Against those Who Co-operate With cops. 45's aim at informers: The Sunday Gleaner, 2006.

2. Ashur, S. and Huberman, B. A. (2010) Prediction of the future with social media. *HP Laboratories*, 53: 492 – 499. doi: 10.1109/WI-LAT. 2010.63.

3. Barton, B., Blenker, A., Smith, L. and Speck, R. (2012) Perception of Crime in the St. Paul Promise Neighborhood: *A review of the literature (unpublished master's Thesis). The University of Minnesota*

4. Brathwaite, A. (2011, July 01). Escalating crime rate in the Caribbean deterring investors, 2011. Jamaica Observer. Retrieved from http://www.jamaicaobserver.com/business/Escalating-crime-rate-in-the-Caribbean-deterring-investors_9104524

5. Basu, I. (2012) Social Media Elevates Community Policing. Retrieved from http//:www.digitalcommunities.com/articles/Social-Media-Elevates-Community-Policing.html

6. Choo, K. and Smith, R. G. (2007) Criminal Exploitation of online Systems *Organized Crime Groups*.

7. Clayton, A. (2012) A New Approach: National Security Policy for Jamaica *The National Security Policy for Jamaica 2012*

8. Daly, G. and Slessor, J. (2011). Extending the Long Arm of the Law to Embrace Social Media *Accenture*

9. DeMoss, N. (2011) Neighbors use social media to fight crime. Retrieved from http://sandspringsleader.com/news/neighbors-use-social-to-fight-crime/article_52aa62e2-cdbd-11e0-80ab-001cc4c03286.html

10. DeMaagd, K. (2009) The ICT-Enabled Global Economic Crisis *GlobDev 2009*. Paper 16.

11. Divon, J. (2011, November 21). Canadian police lead the way in fighting crime with social media. Daily Brew. Retrieved from http://ca.news.yahoo.com/blogs/dailybrew/canadian-police-lead-way-fighting-crime-social-media-223254963.html

12. Encyclopedia of Nations (2012) Country Overview: Jamaica *Encyclopedia of Nations*

13. Gaß, O., Koppenhagen, N., Biegel, H., Maedche, A., and Müller, B. (2012). Anatomy of knowledge bases used in design science research. *Design Science Research in Information Systems. Advances in Theory and Practice*, 328-344.

14. Harriott, A. (2003) Social identities and the escalation of homicidal violence in Jamaica. *Understanding crime in Jamaica: New challenges for public policy*.

15. Harrison, C. (2011) Said gunmen came for him after he reported killing. Murder witness afraid of cops: *The Jamaica online Star*

16. Heeks, R. (2007) ICT4D 2.0: The Next Phase of Appling ICT for International Development. *ICT4D*

17. Hevner, A., March, S., Park, J., and Ram, S. (2004) Design Science in Information Systems Research *MIS Quarterly* (28:1) 2004, pp. 75-105

18. Hevner, R. (2007) A Three Cycle View of Design Science Research *Scandinavian Journal of Information Systems*: Vol. 19: Iss. 2, Article 4.

19. Jaffes, R. (2012). Criminal dons and extralegal security privatization in downtown Kingston, Jamaica. *Singapore Journal of Tropical Geography*, *33*(2), 184-197.

20. Johnson, J. A., and Reitzel, J. D. (2011). Social network analysis in an operational environment: Defining the utility of a network approach for crime analysis using the Richmond City Police Department as a case study *International Police Executive Symposium*

21. Lawrence, R.Z., Hanouz, D.,M. and Doherty, S. (2012). The Global Enabling Trade Report 2012 *World Economic Forum*

22. Meyer-Gossner, M.V. (2011). Criminology and law enforcement officials using social media to fight crime. Retrieved from http://www.thestrategyweb.com/criminology-and-law-enforcement-officials-using-social-media-to-fight-crime

23. Nebeling, M.(2007) "Towards a Generalized Content Model: Facilitating Migration between Content Management Systems based on the Content Repository API for Java Technology Specification (JSR-170)," *Monash University Honours Degree of Bachelor Information Technology and System*

24. Nugrahanto, S., and Morrison, I. (2008). "A Design Science Approach to Modelling and Facilitating Clinical Workflow and Decision Making" *Health Informatics Society of Australia Ltd (HISA)*

25. Ojha, A., Palvia,S. and Gupta, M., P. (2008) A Model for Impact of E-Government on Corruption: Exploring Theoretical Foundations *Critical Thinking in E-Governance*

26. Olson, J. D. and Wills K. J. Community Policing & Social Networking Sites. *Prosecuting Attorneys Association Idaho*

27. Pepper, N. (2012) Source Credibility and the Persuasiveness of Public Safety Messages Communicated Via Social Media *Doctoral dissertation, University of Missouri*

28. Poturalski, H. (2010). Local police use Facebook to fight crime. Journal News. Retrieved from http://www.journal-news.com/news/hamilton-news/local-police-use-facebook-to-fight-crime-988819.html?cxtype=rss_local-news

29. Prasad, K. (2012) "E-Governance Policy for Modernizing Government Through Digital Democracy in India" *Journal of Information Policy2* (2012): 183-203

30. Private Sector Organization of Jamaica (PSOJ) (2011, April 15) Position Paper on National Security *PSOJ*

31. Saunders, C. (2007). Editors' Comments Information Systems in Developing Countries *MIS Quarterly Vol. 31 No. 2*

32. Sierra, L. S. (2010, December 6). Citizens are reporting crime and corruption to Mi Panama Transparente. ICFJ international Center for Journalist. Retrieved from http://www.icfj.org/node/2829

33. Slessor, J. (2012, November, 22) Citizens want to help local police via social media and smart phones. Digital by Default news Retrieve from http://www.digitalbydefaultnews.co.uk/2012/11/22/citizens-want-to-help-local-police-via-social-media-and-smartphone-apps/

34. Straub, D., and Ang, S. (2011) "Rigor and Relevance in IS Research: Redefining the Debate and a Call for Future Research," *MIS Quarterly* (35:1), pp. iii-xi.

35. Sullivan, M. P. (2010). Jamaica: Background and US Relations. *Library of Congress Washington DC Congressional Research Service.*

36. United Nation (2012) Criminal violence taking rising toll in Caribbean countries *United Nations*

37. UNDP (2012) Criminal violence taking rising tool in Caribbean countries: The Caribbean Human Development Report 2012 *UNDP*

38. Waller, L., Bourne, P., Minto, I. and Rapley, J. (2007) A Landscape Assessment of Political Corruption in Jamaica *The Jamaican Economy since Independence Project*

39. Walsham, G., Robey, D., and Sahay S. (2007) Foreword: Special Issue on Information Systems in Developing Countries: *MIS Quarterly.*

40. Wellman, B. (2001). Computer networks as social networks. *Science*, *293*(5537), 2031-2034.

41. Wellman, B. (2002). Physical place and cyber place: The rise of personalized networking. *International journal of urban and regional research*, *25*(2), 227-252