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IMPACT OF ICT ON SOCIAL SCIENCE RESEARCH IN THE ERA OF GLOBALIZATION

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Abstract:
The Information Revolution, and the Information Age that it engender, is being defined by an on-going process of economic, social and political globalization. Social networking tools have captured the imagination of youth and researchers. Researchers today prefer to use internet for surfing the World Wide Web to access relevant material and data including e-journal and e-book. As more and more ICT tools being developed and used in social science research, it is a good idea to reflect how ICT had social science research as a whole as there is a lacking of such study. This study is based on participative observation approach in which ICT had effects on social science research in the following three ICT application areas: a) Pre-data analysis, b) Data analysis, and c) Post-data analysis.

Keywords: globalization, Information and Communication Technology, Social Science Research, ICT tools, research application.

Introduction

21st century is marked by rapid rate of technological and social change. There were Techtronic changes of ICT since 1970s e.g. from mainframe in 1970s, Personal Computer in 1980s, Client Server Architecture in 1990s, and Internet in 2000s to now Big Data Analytics and Cloud Computing in 2010s are distinctly visible. The application of these ICTs had effects on the approach how researchers had conducted their social science research. In 2010s social science research is conducted differently from those in several decades before. Part of the factors may due to the advancement of ICT since several decades ago.

Objectives of the study

The objectives of this paper are three folds. Firstly, it provides an overview on how ICT had effects on social science research as a whole without drilling into each specific social science disciplines like education, psychology, sociology, economies et al. Secondly, it hopes to enable social science researchers to examine themselves whether they are leveraging on some of the ICTs. If they are not, they can start adopting some of the ICTs to improve their research productivity. This second objective also enables researchers to reflect on how ICT had transformed the way they conduct social science research in 2010s compare to those in previous eras. Lastly, this paper can enable ICT professionals to understand how ICT had effects on social science research.

Impact of ICT on Social Science Research

In this changing era of globalization, today both students and academics have particular learning needs and require a number of skills and capabilities to achieve success. ICT had effects on many facets of social science research. They can be classified into three categories which include: a) ICT application in pre-data analysis, b) ICT application in data analysis, and c) ICT application in post-data analysis. ICT application in pre-data analysis refers to examples how ICTs are applied on activities of social science research before reaching the stage of data analysis. ICT application in pre-data analysis includes: Article Availability, Thesis and Dissertation Availability, Literature Search, Content Search, Literature Tracking, Quantitative Data Collection Qualitative Data Collection, Big Data and Its Analytics. ICT application in data analysis includes examples how ICTs are applied on activities during the stage of data analysis and can be divided into: Quantitative Data Analysis and Qualitative Data Analysis Lastly, ICT application in post-data analysis refers to examples how ICTs are applied on activities of social science research after completing the stage of data analysis which covers: References and Bibliography Compilation, Article and Thesis /Dissertation's Discussion among Researchers, Supervisors, and Supervisees and during Viva Voce, Plagiarism Detection, and Journal Manuscripts Submission.

ICT Application in Pre-data Analysis

i. **Article Availability** – Before Internet era, journal articles in hardcopy were very common whereas journal articles in softcopy were very rare. In today's world of social science research, journal articles either online or in softcopy are easily available and accessible. This is made possible by Internet technology in which after those articles were being digitized and uploaded into appropriate repositories, researchers can easily and quickly access to those journal

articles via opened or secured Internet access to preserve a green environment.

ii. **Thesis and Dissertation Availability** – Previously, most of the theses or dissertations in hardcopy were confined within libraries in which researchers need to visit from one library to another in order to gain access to the required literature. Lately, many theses and dissertations are available online or in softcopy accessible from Internet or from universities' Intranet.

iii. **Literature Search** – Last time researchers need to perform manual search on hardcopies of literature in libraries whereby this is a tedious effort and the search results were limited. On the contrary, a lot of research materials, literature and artifacts today can be searched using Internet search engine like Google (www.google.com), Google Scholar (www.scholar.google.com), Yahoo (www.yahoo.com), Wikipedia (www.wikipedia.org), inflibnet.com, ebrary, ejournals universities and libraries internal search engines et al

iv. **Content Search** – Previously when literature were in hardcopies, researchers needs to perform manual search on certain key words or phrases by reading line by line of the literature. Whereas in today's world of research, researchers can utilize the softcopy literature's search or find function (also called content search) to search for specific key words or phrases in which this is more effective and productive. Moreover, the content search also helps qualitative researcher to count the frequency of certain key words appear in an interviewed transcript more effectively.

v. **Literature Tracking** – In the past, researchers have to sort, classify and store all their literature or artifacts that they had reviewed into computer folders or physical folders / place holders. Researchers also need to create their own tracking mechanism e.g. in word document or spreadsheet format to track and manage their reviewed literature so that they can re-use or refer to in future. Doing these manually can be daunting tasks, with the advancement of ICT, researchers can still use the old approaches but more and more researchers now are using software like Mendeley (www.mendeley.com) which can help manage, share and discover the literature contents and contacts that they had reviewed.

ICT Application in Data Analysis

Quantitative Data Analysis – In the past time, statistical software were not easily accessible in which they were limited in functionality e.g. most of them were command-based rather than Graphical User Interface (GUI) and usually located in universities' computer labs. Researchers need to book and had limited time to access the software. Not only data analysis techniques like path analysis, covariance-based Structural Equation Modeling (SEM), variance-based SEM (partial least squares), hierarchical regression analysis, hierarchical linear modeling et al (Hair, Black & Babin, 2010) are gaining popularity, statistical software e.g. Statistical Package for Social Science / SPSS (www-01.ibm.com/software/analytics/spss) are more advanced and rich with a lot of features and functionalities (Field, 2009; Sekaran, 2003).

ii. **Qualitative Data Analysis** – Last time there was lack of software to aid researchers in performing qualitative data analysis in which researchers need to perform it manually or using computer spreadsheet to perform basic sorting, searching and highlighting. Recently, the use of Computer Assisted / Aided Qualitative Data Analysis Software (CAQDAS) by researchers are gaining popularity in which www.qsrinternational.com), ATLAS.ti(www.atlasti.com), MAXQD (www.maxqda.com), SPSS Text Analytics, Transana for video transcribing in certain qualitative research (www.transana.org) et al. are used to support qualitative research in terms of transcription analysis, coding, text interpretation, recursive abstraction et al. Moreover, software like also can be used. The availability and use of CAQDAS greatly improve accuracy and effectiveness of a researcher in terms of transcribing from audio or video to text as well as to perform the necessary encoding and abstraction before moving on to the next stage of the research.

ICT Application in Post-data Analysis

i. **References and Bibliography Compilation** – Last time researchers tend to compile references and bibliography manually. They literally typing in to build the entire section of the references or bibliography then followed by sorting them in ascending order. Recently, while researchers are writing, they can use citation or reference management software like EndNote (www.endnote.com), Zotero (www.zotero.org) or Mendeley et al. to help select citations and populate the references or bibliography automatically (Myers, 2009). This type of software can improve researchers' efficiency and accuracy while preparing their articles or theses.

ii. **Article and Thesis / Dissertation's Discussion** –
In the course of producing an article, thesis or dissertation, there are needs for discussions or communications among researchers, supervisors, during the viva voce. In the past, face-to-face meeting, audio meeting or Short Message Services video conferencing was rarely used. Whereas now in an advanced ICT era video conferencing, Skype, Facebook, Yahoo, lync, Same time, Whatsapp et al. can be a means for effective communication. Moreover, to facilitate sharing of research materials, seeking comments from subject matter experts, enable analytics to monitor papers published, as well as following some scholarly works, certain software platforms or websites e.g. Academia.edu (www.academia.edu), ResearchGate (www.researchgate.net) et al. can speed up the learning curve

iii. **Plagiarism Detection** – Previously, plagiarism acts were slow and hard to detect as the authority of universities or journals dependent on readers to identify them manually while they were reading through the submitted articles or theses / dissertations. With the advancement of ICT, readers or researchers can use plagiarism checker software available in the market like Article Checker (www.articlechecker.com), Plagiarism Checker (www.grammarly.com) Dupli Checker (www.duplichecker.com) et al. to detect any fault of plagiarism has been committed.

iv. **Journal Manuscripts Submission:** In the past, journal manuscript submission used to be via email communications between researchers /authors and journal's editors coordinators. Now web-based journal manuscript management and peer-review software, electronic manuscript submission or management systems like Elsevier (www.editorial.elsevier,com), Wiley (authorservices.wiley.com/bauthor/journal.asp), Sage Publications (www. sagepub.com/journalgateway/msg.htm) et al. are commonly used Using such systems can reduce their time of submission and checking the status of publishing. Using such systems can greatly improve the productivity and quality of work and lost or delay of communication can be minimized.

Conclusion:

This paper is based on the author's observations and experience in using ICT tools to conduct social science research whereby it is also a limitation in which there is no empirical evidence to support the observations claimed. Another future work can be a deeper research to evaluate how big data and its analytics can affect social science research especially in this new dawn of big data era. ICT is a new norm and also an essential enabler to increase the productivity of a social science researcher. ICT had contributed to the achievement of productivity gains of social science researchers. Through multiplier effect, productivity gains by many researchers. ICT will further accelerate and multiply the overall body of knowledge in social science research and also provides opportunity to redesign his work with effective use of information and communication technology.

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