Article Review #1: Cybersecurity Awareness—Measurement
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Article

Chaudhary, S., Gkioulos, V., & Katsikas, S. (2022) *Developing metrics to assess the effectiveness of cybersecurity awareness program*. OUP Academic.

Literature Review

The journal article "Developing metrics to assess the effectiveness of cybersecurity awareness program" was written by scholars in the Department of Information Security and Communication Technology, Norwegian University of Science and Technology, Teknologivegen 22, 2815 Gjøvik, Norway for the Journal of Cybersecurity and published in 2022 in Volume 8, Issue 1. A method to measure the effectiveness of cybersecurity awareness programs is an iterative process in maintenance that requires a redundant yet dynamic approach to yield constructive and valuable results.

Article Summary

- *Describe the study's research questions or hypotheses*

- *Describe the types of research methods used*

- *Describe the types of data and analysis done*

Great emphasis was placed that "Cybersecurity is not just about technology" (Chaudhary, Gkioulos, & Katsikas, 2022, p.1), and there was much more needed attention on the knowledge, attitude, and behavior (KAB) of people with their interactions with technology. These KABs were highlighted in their importance to various organizations' cybersecurity awareness (CSA) programs for their effectiveness in both subjectivity and objectivity data translations in an empirical fashion. Their importance lies in how effectively they help interpret or translate subjective (personal opinions, experiences) and objective (factual, measurable) data. This translation or interpretation process is conducted empirically, meaning it's based on observation, knowledge, or experiments, rather than just theory or assumptions. The question, "What is the right method for evaluating a CSA?" was the authors' main goal. Their purpose, "the main objective of this paper is to define the right metrics for evaluation" (Chaudhary, Gkioulos, & Katsikas, 2022, p. 1), involved gathering a collection of "major works that proposed methods for the evaluation of a CSA program" (Chaudhary, Gkioulos, & Katsikas, 2022, p. 1), complemented with a thorough review of identified four main approaches. These approaches were process improvement, attack resistance, efficiency and effectiveness, and lastly internal protections. Subjectivity was vividly noted before and throughout their process, as parts of the social aspects involving measurement methods cannot be clearly defined nor was a standardized method established. Gathering articles was the next obstacle for the scholars, as

they collected, filtered, and analyzed through "a manual screening of 350 results in Google Scholar Citation and 400 results in Microsoft Academic" (Chaudhary, Gkioulos, & Katsikas, 2022, p. 5), using multiple and effective keyword queries, a final selection of thirty-two papers was made for evaluation. It was imperative to the scholars that their final product remained unbiased, considering "gray literature" (Chaudhary, Gkioulos, & Katsikas, p. 5), to be included. (Chaudhary, Gkioulos, & Katsikas, 2022, Table 3, p. 7-8), clearly outlined the measurement factors alongside its reference paper. (Chaudhary, Gkioulos, & Katsikas, 2022, Table 4, p. 9-10) followed on to display the measurement factor with its measurement method. Their research method and execution uncovered the intricate nature of human behavior, and communication mediums that negatively affect the yield of accurate results in CSA programs. They identified that not only was the delivery of the CSA program affected by social structure but also the methods for metric calculations for determining effectiveness were affected negatively by the social method of observation. Toward the end of their research, the authors convey the message of metrics development requirement urgency for all organizations with a CSA program. A proposed metrics is displayed under the Metrics Development section (Chaudhary, Gkioulos, & Katsikas, 2022, p. 13) consisting of five criteria which the authors conclude, "The goal and objective should serve to uphold the reason for creating an awareness program," (Chaudhary, Gkioulos, & Katsikas, 2022, p. 14) In their conclusion and closing remarks, Chaudhary, S., Gkioulos, V., & Katsikas, S., declare "evaluation of a CSA program is an important activity in the post-implementation phase" (Chaudhary, Gkioulos, & Katsikas, p. 17) harmonizing the pre, during, and post cycle of a CSA program, that the gestalt is heavily dependent on the mentioned three phases. Further, it is concluded that a "lack of evaluation" (Chaudhary, Gkioulos, & Katsikas, p. 17) can ironically do more harm than good.

Critical Review

- *Describe how the topic relates to the principles of the social sciences*
- *Describe how concepts from the PowerPoint presentations relate to the article*

As an interdisciplinary field of studies, cybersecurity does not alarm the undergraduate student that the social science aspect of a CSA program is the independent variable. Displaying the different categories of measured factors to their correlating measurement method is heavily scrutinized for subjectivity. For example, in (Chaudhary, Gkioulos, & Katsikas, 2022, p. 10), Interest and a measurement method is Silent observation of participants during the session, e.g. yawning, side talking, and frequency of short breaks taken. The

observer's observations results are ambiguous in nature due to individuality. Iterated by the authors was their yield for unbiased results, which they effectively showcased through the inclusion of grey work. Also, to call attention to, the detailed query of literature for narrowing down results and in-depth analysis to formulate their approach toward the research. Included in their research that aided in success was their attention to acknowledging the importance of external issues that would lead to inaccurate measurements. The compilation of this research was both inductive and deductive, which would support Bhattacherjee, A.'s statement "a complete researcher" (2012, p. 13); and the abilities of the scholars to fully handle the cycle of research. Aware of the deliverance, the scholars allowed the reader to understand the key role of media and its effectiveness not only in evaluation but also in driving engagement and reinforcing cybersecurity behaviors across diverse audiences. They highlight how the strategic use of media tools can amplify the reach and impact of cybersecurity awareness programs, making the communication of essential security practices more accessible and comprehensible. Additionally, the article underscores the importance of developing metrics that accurately measure both short-term behavioral changes and long-term cultural shifts within organizations, ensuring that cybersecurity awareness initiatives are both practical and sustainable.

Closing Remarks

- *Describe how the topic relates to the challenges, concerns, and contributions of marginalized groups*

- *Describe the overall contributions of the studies to society*

Integration and repetition are necessary for developing a clearly defined metric for evaluating a CSA program. The key variables that compose KAB have been identified as evolving linearly with technology. "The primary objective of a CSA program is to motivate or influence the participants in the adoption of secure online behavior." (Chaudhary, Gkioulos, & Katsikas, 2022, p. 5) An effective CSA program will aid in an organization's cybersecurity posture, preventing some of the most common threats facilitated by social engineering. In addition, good cybersecurity hygiene is carried along as a result. The conclusion of this research still leaves a void mentioned by the authors, that a non-standard evaluation for a CSA program is undeveloped. The research approach shows that a compilation of literature is the first step to establishing a document recognized for metric calculation and evaluation of a CSA program. A daunting task, adopting and implementing of a CSA program cycle leaves no room for exclusion. Large corporate entities face greater challenges. Small businesses may encounter less overhead in management in implementation, but their involvement is

necessary and the thought of immunity from cyber threats must be abolished. A CSA program is meant for all to be a part of and contribute to.

References

Bhattacherjee, Anol, "Social Science Research: Principles, Methods, and Practices" (2012). Textbooks Collection. 3. https://digitalcommons.usf.edu/oa_textbooks/3

Chaudhary, S., Gkioulos, V., & Katsikas, S. (2022, May 23). *Developing metrics to assess the effectiveness of cybersecurity awareness program*. OUP Academic. https://academic.oup.com/cybersecurity/article/8/1/tyac006/6590603?searchresult=1