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Presentation Title:

Effectively leveraging technology and innovation in the management virtual cybersecurity teams

By

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Abstract:

The U.S. Department of State, Fulbright Commission, and other organizations have been using virtual fellowships and other variations of virtual teams as communities of practice experts to address some of the most pressing issues around science, technology, and public policy. These teams have allowed organizations to leverage expertise to create innovative solutions on issues, problems, or questions faced both domestic and abroad, without requiring physical relocation. Complex organizations have several significant and critical job tasks around cybersecurity technology, strategy, and policy. These roles have the complex task of functioning as effective teams to handle incident responses, intrusion evaluations, crisis management, crisis communications, data forensic examinations, malware analyzations, firewall assessments, penetration testing, disaster recovery, emergency response planning, risk management, human factor analyzation, training assessment, and active network monitoring (someone capable of making the network fabric the most secure and reliable as possible. Skilled in determining baseline network behavior and detecting anomalies). Often for global organizations, these team members can be deployed in locations around the world functioning as a virtual team that must be collaborative and cohesive to be effective. This presentation explores the nature and nuances of collaborative virtual cybersecurity teams.

Globalization, economic shifts, and technological innovation have created new risks around cybersecurity and cybercrime. These environmental factors require that organizations become more innovative, more collaborative, more adaptive, and more competitive to avoid cybersecurity disasters (Larrimore, 2018). Organizations with a competitive advantage successfully leverage both current technology and human resources to enhance its ability to engage in effective risk management and information security (Larrimore, 2018). As a result, many organizations are using virtual teams as a cost-effective way to access and distribute knowledge expertise across the organization (Agbi, 2018).

According to the 2017, Cybersecurity Trends report organizations are increasing their spending on cybersecurity on average by 21% (National Center for Midmarket, 2017). Consider the business adage that a team is only as strong as its weakest link. When it comes to your cybersecurity team, especially those that most work virtually this adage has tremendous organizational repercussions. Effective cybersecurity teams must respond to a variety of threats. As a result, building collaborative teams has never been more important to the effective

prevention of cyber threats (Edwards, 2018). Organizations that are effective in cybersecurity prevention requires team collaboration between network and cybersecurity teams (Edwards, 2018). Dysfunction between team members represents some significant dangers and risks to organizations around data security (Sousane, 2018). Effective collaborative cybersecurity teams are critical to developing an effective and holistic cybersecurity culture (Sousane, 2018).

Traditional employee teams are those that work at the same location and traditionally communicate and meet in person or face to face (Perkins, 2018). Virtual teams, on the other hand, engage each other using technology in ways beyond the limitations of having to be in the same physical location (Ng Lane, 2018). The utilization of virtual teams allows organizations to harness intellectual capital, subject matter expertise, and a diverse pool of talent and service based on specific situations or company goals, without out restriction of geography (Ng Lane, 2018). For example, an organization located in Claremont, California could potentially leverage the human capital expertise and professional of an employee in Toronto, Canada or Washington, DC, to be part of a virtual or remote cybersecurity team. The ability to leverage virtual or remote teams and opportunities becomes a vital recruiting tool for organizations looking to find expertise in cybersecurity job roles that often face shortages of cybersecurity talent.

Cybersecurity and Information security analysts (ISA) positions are expected to grow 18% through 2024 because ISAs are involved in mitigating cyber vulnerabilities in corporate networks (Morgan, 2016). Crimes related to cyber costs businesses upwards of \$400 billion annually accompanied by the rapid integration of technology, electronic communications, and digitalization efforts project the cost of cybersecurity breaches to \$2.1 trillion globally by 2019 (Morgan, 2016).

New technologies have made it easier for professionals in different geographic locations to collaborate and communicate which has enabled greater use of virtual teams in organizations (Hagy, 2018). The formation and growth of virtual teams in organizations indicate major shifts in how work is accomplished and, more importantly, how members collaborate to perform and manage the work (Gelston, 2018).

Functioning as a team virtually is conceptualized on a continuum in which the more dispersed a team is, the more virtual it is (Martin, 2018). The concept of a virtual team acknowledges that there will be some variation in the ways in which members interact, e.g., members may be geographically dispersed and interact only through email, voicemail or other communication technologies, they may be co-located and meet face-to-face, or they may be a combination of these (Martin, 2018). In contrast to traditional face-to-face teams, working virtually has some challenges including those around control and coordination, knowledge development and transfer, team effectiveness, and trust (Hagy, 2018).

The significant benefit of the utilization of virtual teams is that talent, experience, and expertise can be leveraged and harnessed quickly from anywhere in the world based on need rather than location and without the added costs or time associated with relocation or travel (Agbi, 2018; Martin, 2018; Perkins, 2018).

Additionally, according to Martin (2018), as virtual team members span several time zones and geographies, the added benefit of virtual teams is having resources available nearly twenty-four hours a day. While viewed as an advantage to the organization, the notion of twenty-four, round-the-clock access may be viewed as a disadvantage to the individual members (impacting work-life balance)

Such diverse and dispersed teams communicate mainly through technology (Martin, 2017). Such communication raises the challenge for the team leader of how to unify the team,

and have the members identify themselves collectively as a knowledge sharing collaborative community (Hagy, 2018). Additionally, organizational leaders should understand that trust and relationship building on virtual teams are not based upon traditional aspects that are typically found in collocated team atmospheres (Hagy, 2018). Understanding the difference between the two teams is important when constructing a collaborative-friendly, virtual team environment (Hagy, 2018). In contrast to traditional face-to-face teams, remote collaboration forces virtual teams to address dispersion in areas such as control and coordination knowledge development and transfer, team effectiveness and trust (Al Amour, 2018; Hagy, 2018).

The collaboration of diverse communities of innovators provides opportunities for innovative knowledge developments and breakthroughs (Friedman, 2007). According to Tapscott and Williams (2008, p. 153), people's ability to collaborate, innovate, and use technology to develop new processes and inventions is often a key driving force behind the kind of developments that keep citizens, businesses, and commerce from languishing. Collaboration and technological innovation are critical to creative, global, multinational, and knowledge-driven economies (Friedman, 2007). Knowledge can build more rapidly within shared and collaborative networks of professionals that use technological innovation to communicate, distribute ideas, benchmark, and share lessons learned from both successes and failures (Brown & Duguid, 2000).

Virtual teams are becoming more relevant, necessary, and utilized as the marketplace shifts towards a multi-dimensional, globalized structure (Malone, 2014). The organizations that refuse to embrace virtual teams or worse, do not discover how to efficiently and effectively lead their virtual teams will face increased risks of team failure (Giangergorio, 2017). Understanding how to guide these complex, but potentially highly beneficial subsystems within organizations are much easier said than done (Malone, 2014)

If managers can embrace the cycle of success model, they potentially can demystify the aura of communication, trust, and relationship building in virtual climates. It has long plagued virtual teams and external team leaders, how to increase these seemingly collocated characteristics while working amongst dispersion (Malone, 2014).

References

Agbi, R. O. (2018). *Leadership communications strategies for enhancing virtual team performance* (Order No. 10748206). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (2026711541). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2026711541?accountid=35812>

Al Amour, M. (2018). *Leadership for virtual teams: Perspectives on communications, leader traits, and job satisfaction* (Order No. 10828994). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (2072579991). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2072579991?accountid=35812>

Amurgis, W. (2007). Paving the way for an intranet revolution at AEP. *Strategic Communication Management*, 11(3), 8-102. Retrieved from <http://www.melcram.com/products/journals/scm.shtml>

Brown, J. S. & Duguid, P. (2000). *The Social Life of Information*. Boston; Harvard University Press.

Colfax, R. S., Santos, A. T., & Diego, J. (2009). Virtual leadership: A green possibility in critical times but can it work? *Journal of International Business Research*, 8, 133-139. Retrieved from <http://www.jibs.net/>

Edwards, M. M. (2018). *Identifying factors contributing towards information security maturity in an organization* (Order No. 10746212). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (2018859946). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2018859946?accountid=35812>

Gelston, G. M. (2018). *Virtual leadership in complex multiorganizational research and development programs* (Order No. 10829139). Available from ProQuest Dissertations & Theses Global. (2058035370). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2058035370?accountid=35812>

Giangergorio, E. (2017). *Practical Remote Team Leadership: Methods, tools, and templates for virtual leaders*. Amherst, MA: HRD Press.

Gratton, L., & Erickson, T. J. (2007). Eight ways to build collaborative teams. *Harvard Business Review*, 85(11), 100-109. Retrieved from <http://hbr.org/>

Gratton, L., Voigt, A., & Erickson, T. J. (2007). Bridging fault-lines in diverse teams. *MIT Sloan Management Review*, 40(4), 22-29. Retrieved from <http://sloanreview.mit.edu/>

Hagy, M. R. (2018). *Trust at no sight: Establishing trust in the process rather than in the individual members of a global virtual team* (Order No. 10813764). Available from ProQuest Dissertations & Theses Global. (2099573117). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2099573117?accountid=35812>

Johnson, J. (2005). The virtual workplace: The price is right. *Network World*, 22(36). Retrieved from <http://networkworld.com/>

Larrimore, N. P. (2018). *Risk management strategies to prevent and mitigate emerging operational security threats* (Order No. 10747292). Available from ProQuest Dissertations & Theses Global. (2023213918). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2023213918?accountid=35812>

Malone, O. (2014) *101 Leadership Actions for Creating & Managing Virtual Teams*. Amherst, MA: HRD Press.

Mancini, D. J. (2010). Building organizational trust in virtual teams. *Journal of Behavioral Studies in Business*, 2, 1-5. Retrieved from <http://www.aabri.com/jbsb.html>

Martin, K. A. (2018). *Study of productivity rates for geographically distributed agile teams* (Order No. 10826315). Available from ProQuest Dissertations & Theses Global. (2057566211). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2057566211?accountid=35812>

Morgan, Steve. (2016b, April, 7). African Americans Underrepresented In the Cybersecurity Field. Forbes. <https://www.forbes.com/sites/stevemorgan/2016/04/07/african-americans-underrepresented-in-the-cybersecurity-field/#3c1ad72915c9>

Ng Lane, J. (2018). *Teams and organizing in the digital age: How team networks form and why they perform* (Order No. 10817033). Available from ProQuest Dissertations & Theses Global. (2070941894). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2070941894?accountid=35812>

National Center for Middle Market (2017). Cybersecurity and the middle market: The importance of cybersecurity and how middle market companies manage cyber risks. National Center for Middle Market. Retrieved from:
http://cybersecuritycenter.middlemarketcenter.org/Media/Documents/NCMM_Cybersecurity_Report_FINAL.pdf

Perkins, M. J. (2018). *Organizational leadership activities that positively influence virtual employee engagement* (Order No. 10785852). Available from ProQuest Dissertations & Theses Global. (2031062890). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2031062890?accountid=35812>

Quisenberry, W., Burrell, D. (2012). Review of Management Innovation & Creativity. Winter2012, Vol. 5 Issue 16, p97-116. 20p.

Sousane, R. (2018). *Understanding federal cybersecurity culture: An expert perspective on current and ideal state* (Order No. 10785377). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (2030526181). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2030526181?accountid=35812>

Vignovic, J. A., & Thompson, L. F. (2010). Computer-mediated cross-cultural collaboration: Attributing communication errors to the person versus the situation. *Journal of Applied Psychology*, 93, 265-276. doi:10.1037/a0018628

Weimann, P., Hinz, C., Scott, E., & Pollock, M. (2010). Changing the communication culture of distributed teams in a world where communication is neither perfect nor complete. *Electronic Journal Information Systems Evaluation*, 13, 187-196. Retrieved from <http://www.ejise.com/>

Zuhdi, B. (2018). *Information security risk analysis and advanced persistent threat: A multiple case study* (Order No. 10837747). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (2085189586). Retrieved from <https://search-proquest-com.contentproxy.phoenix.edu/docview/2085189586?accountid=35812>