UNDERWAY TO IDENTIFYING COMMONALITIES OF CYBERSECURITY INCIDENTS IN THE MARITIME TRANPSORTATION SYSTEM

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Agenda

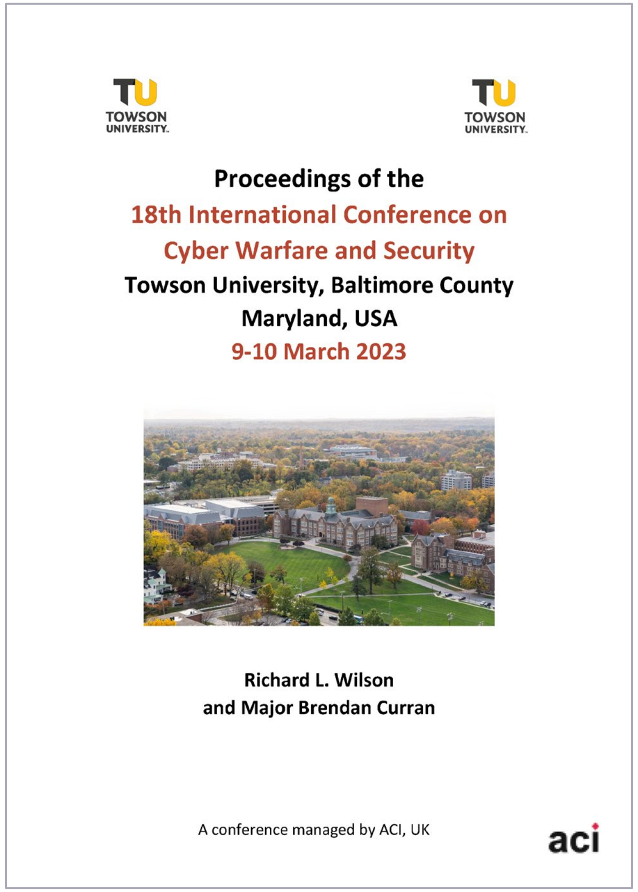
- Introduction
- Related Work
- Methodology and Research Design
- Results and Discussion
- Conclusion, Limitations, and Future Work
- Questions

Introduction

Image Credit: Michael A. McCoy for The Washington Post via Getty Images / Getty Images

Related Work

- Previously published initial work in *Identifying Commonalities of Cyberattacks Against the Maritime Transportation System (MTS)* in March 2023.
- Lack of research informing the MTS about trends in cybersecurity incidents:
  - What are the commonalities?
  - How are MTS systems affected?
  - Where should MTS resources be focused?
  - What tactics, techniques, and procedures (TTPs) are used?



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Proceedings of the
18th International Conference on
Cyber Warfare and Security
Towson University, Baltimore County
Maryland, USA
9-10 March 2023

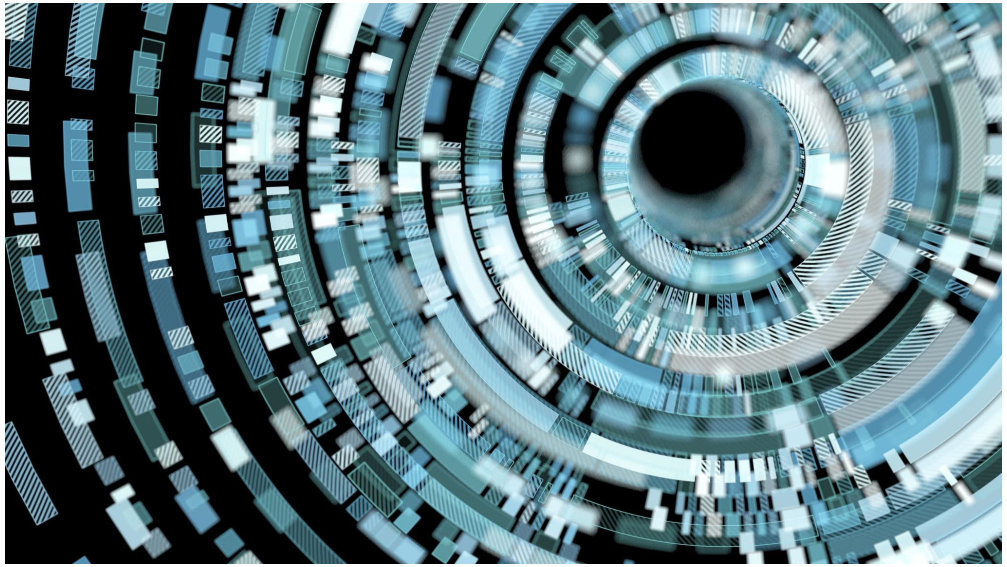
Richard L. Wilson
and Major Brendan Curran

A conference managed by ACI, UK

aci

Methodology and Research Design - 1

- Combine models and concepts to develop a more comprehensive threat picture
  - Diamond Model of Intrusion Analysis:
    - Adversary
    - Victim
    - Social-Political Needs
  - Parkerian Hexad:
    - Confidentiality-Integrity-Availability (CIA) Triad plus:
      - Possession
      - Authenticity
      - Utility
  - MITRE ATT&CK Framework:
    - Tactics
    - Techniques

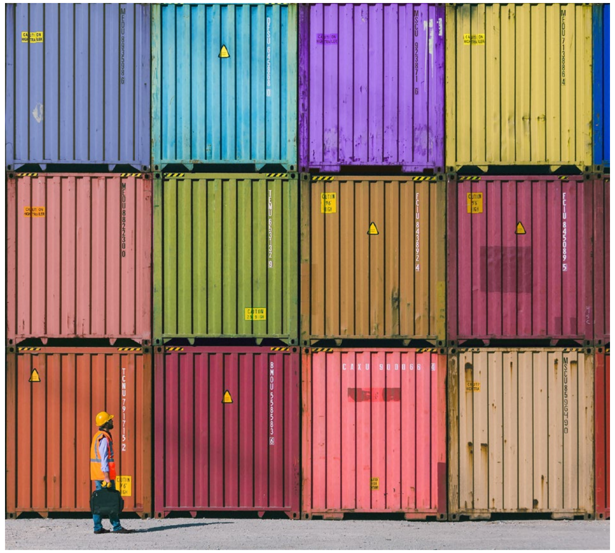


Methodology and Research Design - 2

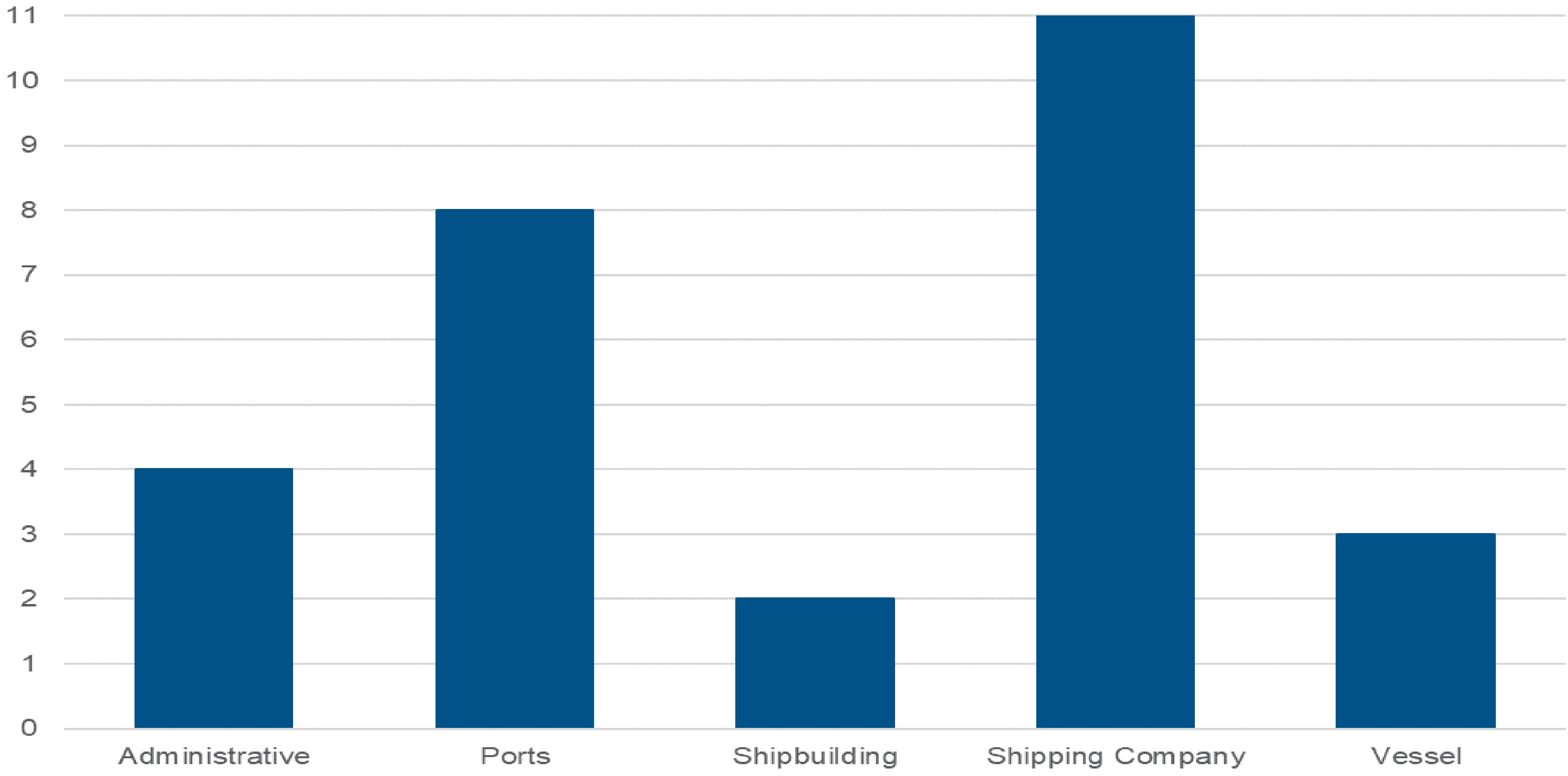
- Limited, exploratory document analysis expanding upon prior research using:
  - Center for Strategic and International Studies' (CSIS') *Significant Cyber Incidents*
    - 2006-Present: Cyberattacks against defense sector, government agencies, technology companies, and economic crimes ($1M+)
  - Council on Foreign Relations' (CFR') Cyber Operations Tracker
    - 2005-Present: Publicly known, state-sponsored cyber incidents
- Combined entries from CFR and CSIS
- Removed duplicates or entries lacking specific keywords—*maritime, port(s), logistics, ship, shipping, shipbuilder, terminal, vessel*
- Discarded entries related to military operations--*submarines, navy,*

Results and Discussion

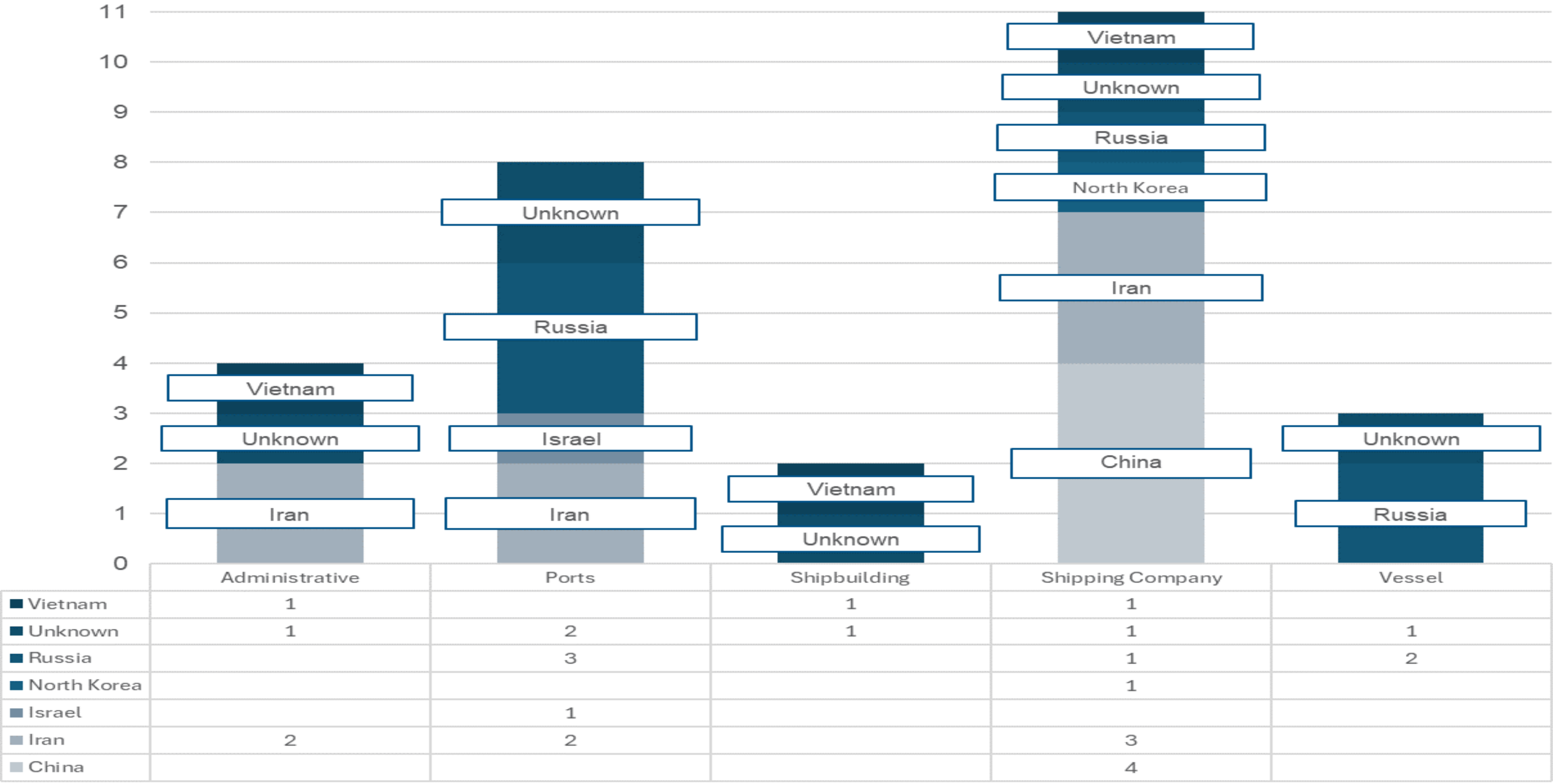
- MTS Aspect:
  - Administrative: maritime entity providing software or other support
  - Ports: ports/terminals where cargo is loaded/unloaded
  - Shipbuilding: companies building ships or equipment used by MTS
  - Shipping Company: company handling business or physical aspects of moving cargo
  - Vessel: a ship or merchant vessel transporting cargo
- Adversary:
  - Country
  - Social-Political Need
- Parkerian Hexad Element
- MITRE ATT&CK Tactic/Technique



Cyber Incidents per MTS Aspect

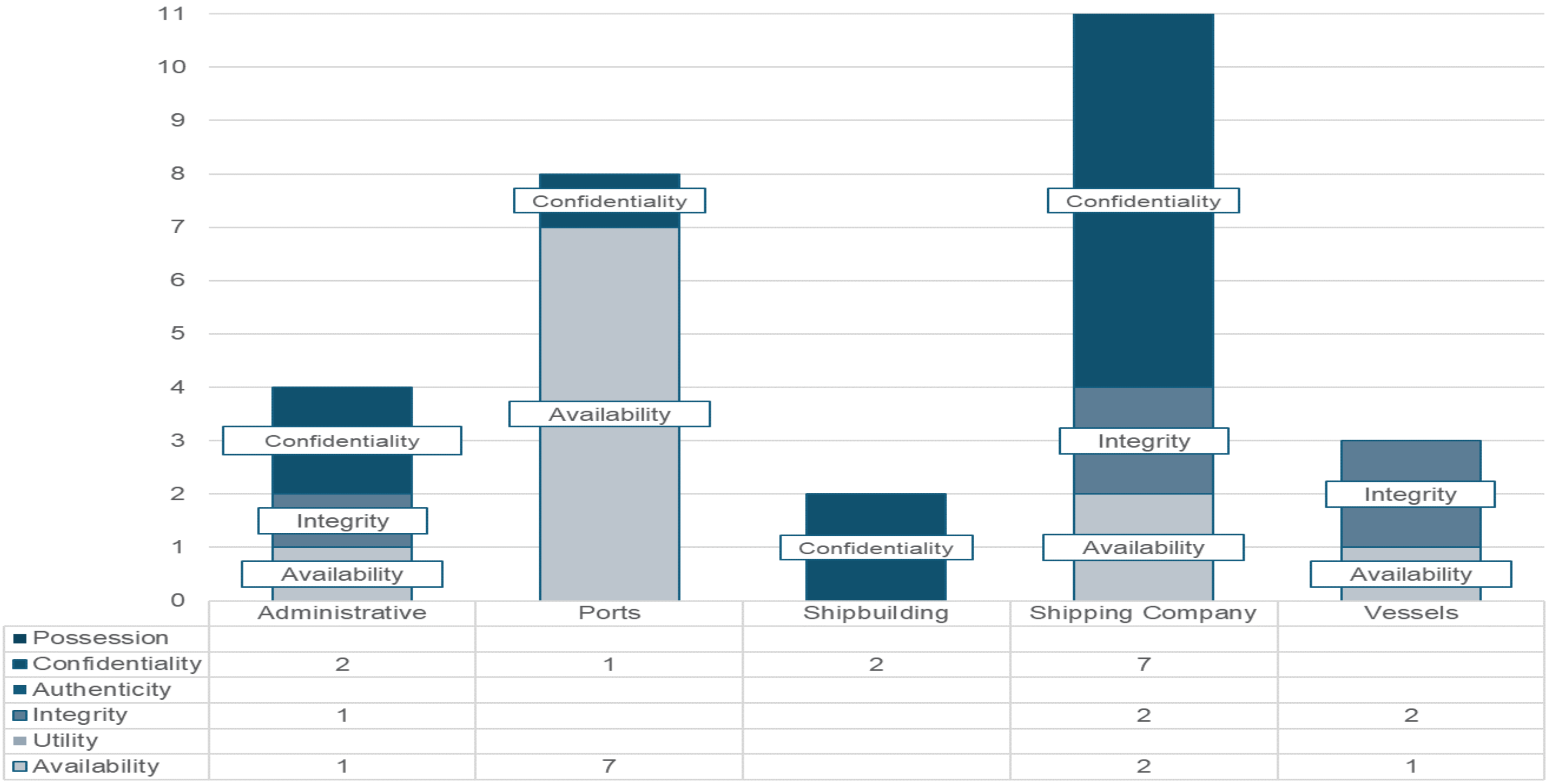


Adversary Customer per MTS Aspect



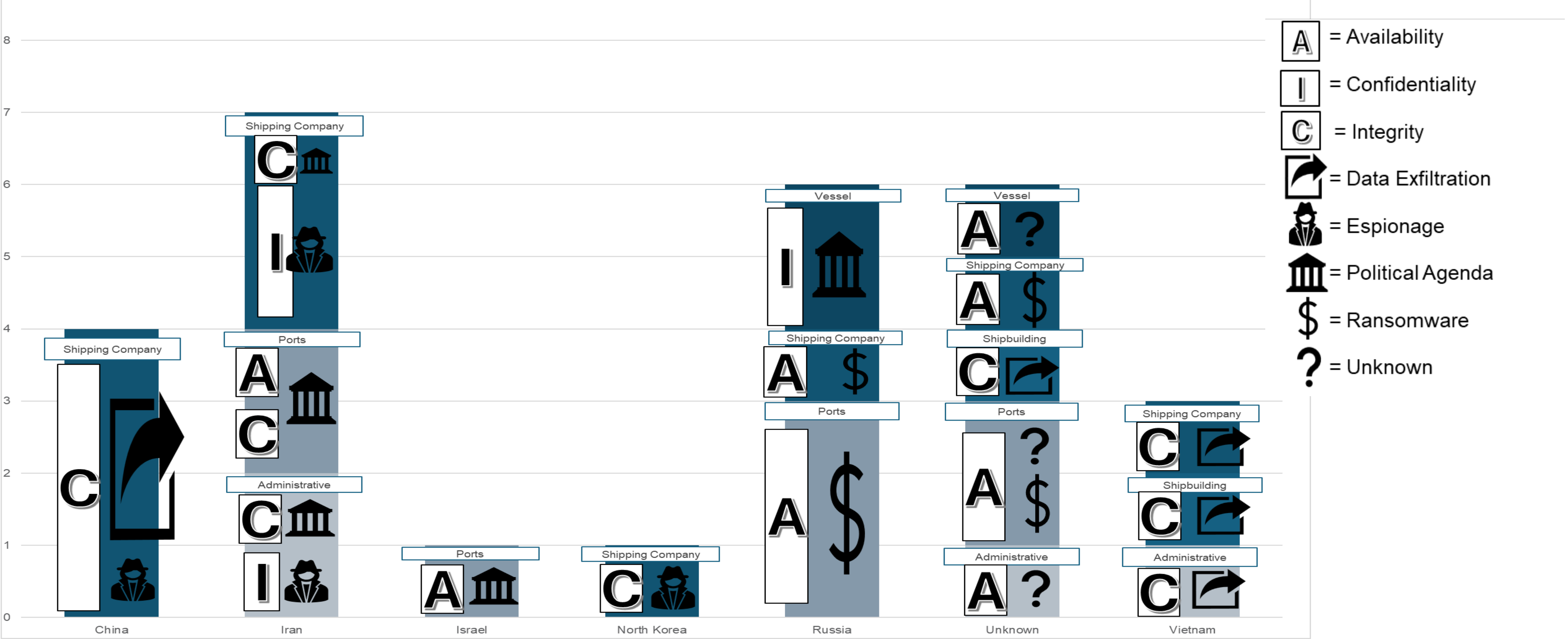
	Administrative	Ports	Shipbuilding	Shipping Company	Vessel
■ Vietnam	1		1	1	
■ Unknown	1	2	1	1	1
■ Russia		3		1	2
■ North Korea				1	
■ Israel		1			
■ Iran	2	2		3	
■ China				4	

Parkerian Hexad Element per MTS Aspect

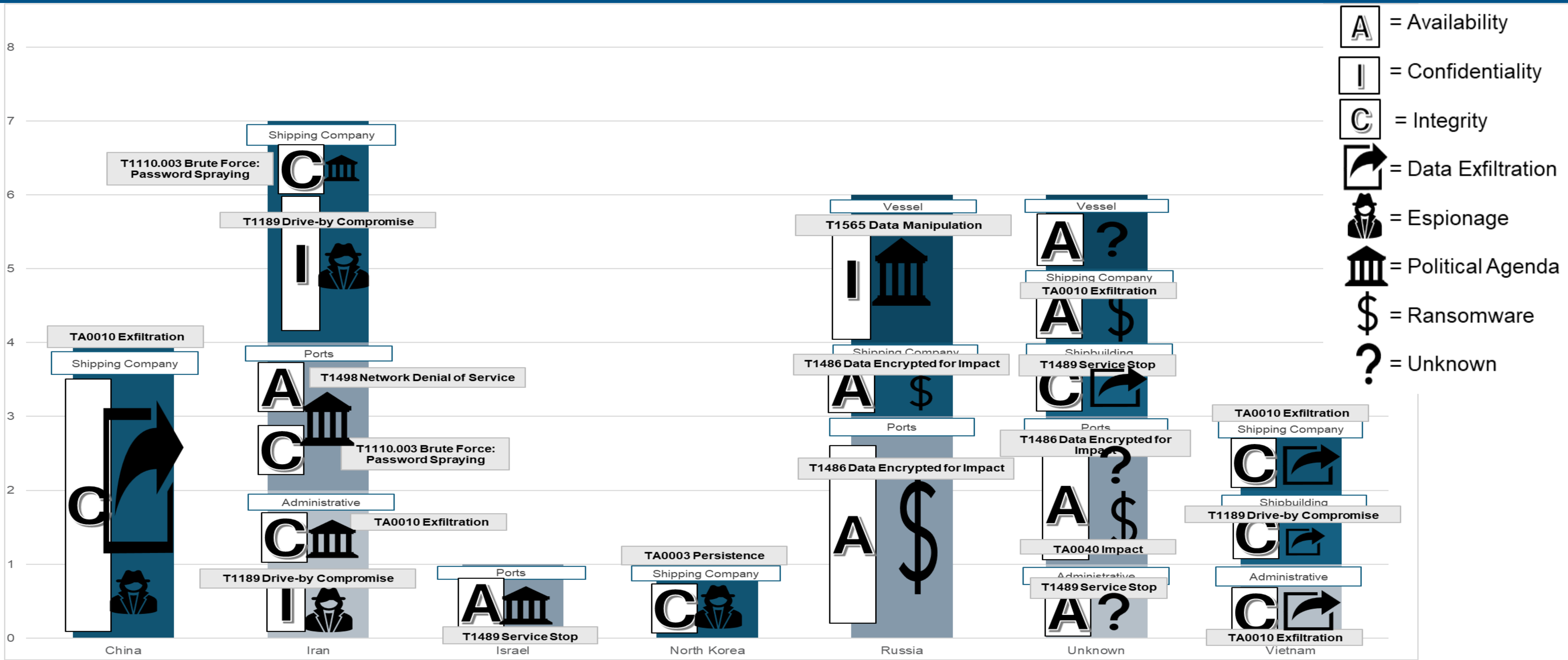


	Administrative	Ports	Shipbuilding	Shipping Company	Vessels
■ Possession					
■ Confidentiality	2	1	2	7	
■ Authenticity					
■ Integrity	1			2	2
■ Utility					
□ Availability	1	7		2	1

+ Social-Political



MITRE ATT&CK Tactics & Techniques



Conclusion, Limitations, and Future Work

- Conclusion: Commonalities do exist in cyberattacks against the MTS
- Limitations:
  - Lack of publicly available data
  - Available MTS cybersecurity incident information is disjointed across a myriad of sources
  - Did not include military operations
- Future Work:
  - Establish guidelines for categorizing MTS Aspect, Parkerian Hexad, Social-Political Need, and MITRE ATT&CK Tactics/Techniques
  - Expand work to include military
  - Incorporate additionally publicly available data, such as the Maritime Cyber Attack Database maintained by NHL Stenden University of Applied Sciences

For more information:
www.cisa.gov

Questions?
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