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Culture Matters! Best Practices for Addressing Culture in Cybersecurity (Education)

Institution:

FHNW University of Applied Sciences Northwestern Switzerland, School of Business

Sponsor: Movetia

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May 25

Agenda

- Background
- Literature review
- Research questions and objectives
- Theoretical framework
- Methodology and data analysis
- Results and discussion
- Conclusion and areas for further research
- Questions & answers

01

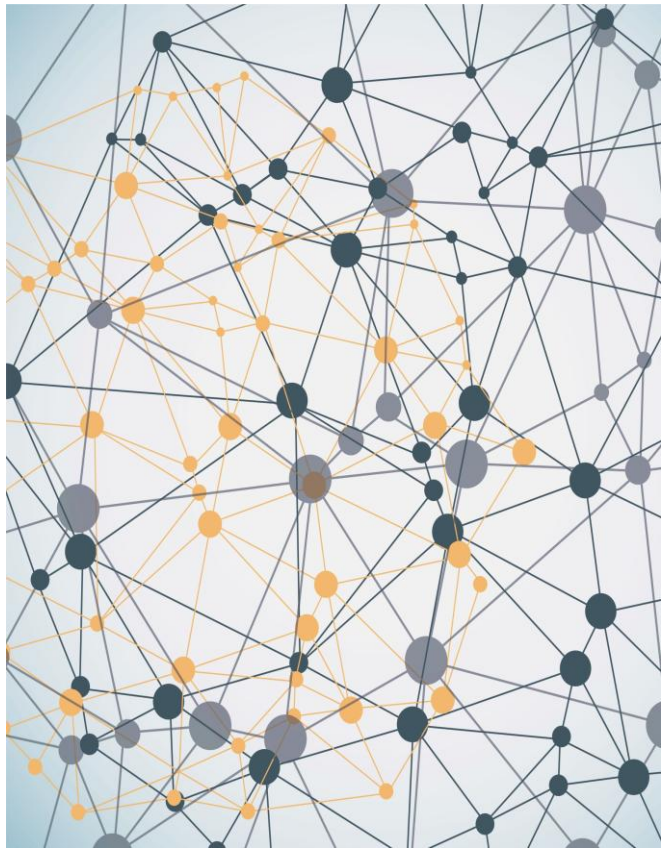
BACKGROUND

Background (1/3)

Cybersecurity:

- The preservation of confidentiality, integrity and availability of information in Cyberspace (ENISA, 2015).
- Global security rose by 38% in 2022
- Cyberattacks transcend borders.
- The WannaCry Ransomware affected over 150 countries (SentinelOne, 2024).
- Cybersecurity affects both SMEs and big corporations.

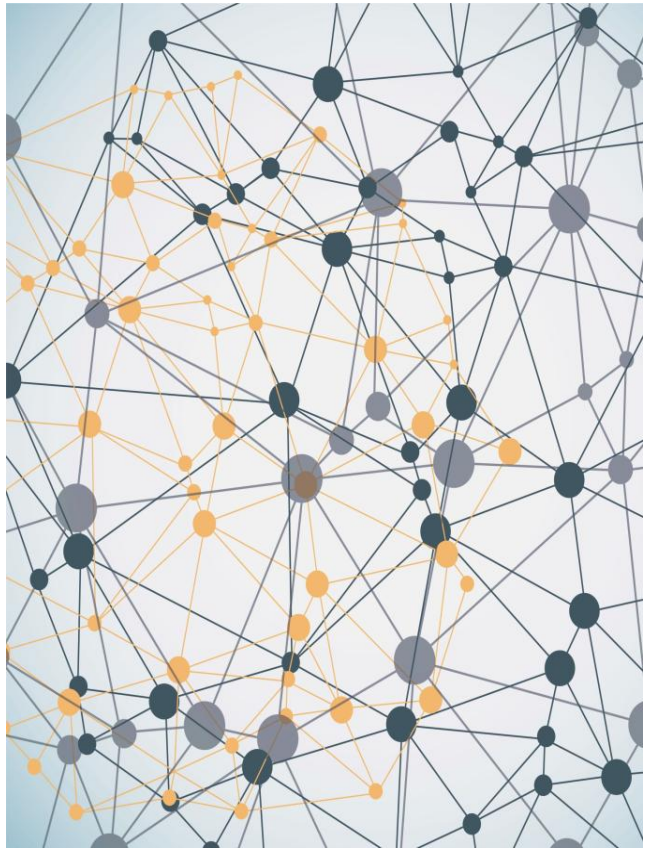
Background (2/3)



The Link to National Culture:

- Past studies show that attention is mainly on the technical aspects of cybersecurity.
- While humans remain the weakest link in the cybersecurity chain, less attention is given to human elements, and worse still, the cultural aspects.
- Every individual is born into a culture.
- Cultural background influences our way of life, beliefs, attitudes, values, decision-making, etc.
- How does cultural background influence individuals' actions and attitudes towards cybersecurity?

Background (3/3)



The Link to Organisational Culture:

- This refers to how people within an organisation relate to each other, their work, and to the outside world.
- It comprises shared assumptions, values, beliefs, and what behaviour is considered appropriate or inappropriate by the members within the organisation.

→ How does organisational culture influence employees' actions and attitudes towards cybersecurity?

02

LITERATURE REVIEW

The Gap in Literature

Human aspects & cybersecurity attitude → Great Coverage

e.g., trust, user personality, risk-taking, language, personal initiative

National Culture and Cybersecurity

- Main focus is on country-level cybersecurity development.

e.g., influence of power distance, individualism, uncertainty avoidance, etc

Organisational Culture and Cybersecurity

- Main focus is on broader organisational culture.

e.g. security culture, leadership, training, etc

Identified Gaps:

Limited research on…

- ✓ culture and individual cybersecurity behaviour
- ✓ implicit organisational culture and cybersecurity
- ✓ how to integrate culture into cybersecurity education

03

RESEARCH QUESTIONS & OBJECTIVES

Research Questions & Objectives

1. What cultural factors play a significant role in the field of cybersecurity?
   - ✓ The influence of national culture
   - ✓ The influence of organisational culture
2. How can these cultural elements be addressed in cybersecurity education?

Objective 1

To investigate the role of national culture in human cybersecurity behaviour in Switzerland and in Cameroon.

Objective 2

To investigate the role of organisational culture in human cybersecurity behaviour in Switzerland and in Cameroon.

Objective 3

To develop guidelines for incorporating the identified cultural elements in cybersecurity education.

04

THEORETICAL FRAMEWORK

Theoretical Framework

1. Hofstede Cultural Dimensions:

- Six cultural dimensions differentiating groups of individuals in one country from another country.
  - Power distance; Individualism; Motivation towards achievement and success; Uncertainty avoidance; Long-term orientation; and Indulgence.

→ **Based on these dimensions, Cameroon & Switzerland are culturally different.**

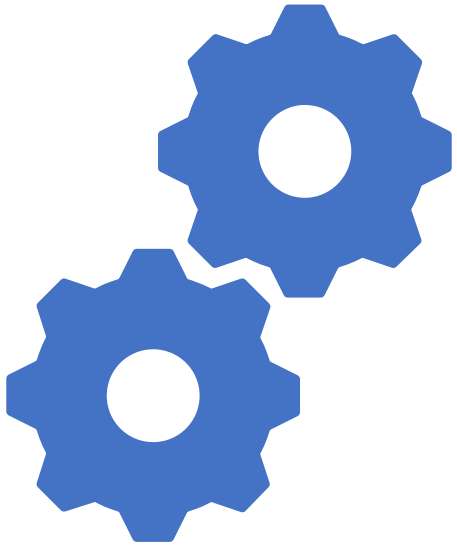
→ How do these dimensions relate to cybersecurity human behaviour?

05

METHODOLOGY & DATA ANALYSIS

Methodology

- **Research Design:**
  - Cross-sectional design
- **Data Collection Method:** Qualitative approach
  - Episodic Interviews and Focus groups
    - ✓ 9 episodic interviews in Switzerland & 6 episodic interviews in Cameroon
    - ✓ 1 focus group discussion in Switzerland & 2 focus group discussions in Cameroon
- **Participants:**
  - CTOs, cybersecurity educators, specialists & students (IT, business, etc)
- **Data Analysis:**
  - In-vivo and descriptive methods of coding → to stay close to participants' words.



06

RESULTS & DISCUSSION

Objective #1 – Based on Interviews in Cameroon

➢ **The influence of national culture on human cybersecurity behaviour:**

Cameroon	
• **Cultural vulnerability:** ✓ Lack of cybersecurity resources in local languages & that match the country's cultural diversity. • **Government policies:** ✓ Lack of stringent cybersecurity policies. • **Resistance to change:** ✓ Unfamiliarity with technology breeds reluctance to embrace digital cybersecurity measures.	• **Attitude to sharing & trust** ✓ A collectivist approach to sharing common knowledge & experience leads to a positive cybersecurity attitude. ✓ Blind trust could be a danger to cybersecurity.

Objective #1 – Based on Interviews in Switzerland

➢ **The influence of national culture on human cybersecurity behaviour:**

Switzerland	
• **State policies:** ✓ The role of the state to enforce cybersecurity policies. • **Attitude towards the unknown** ✓ Some Swiss tend to question unfamiliar cybersecurity policies.	• **Trust** ✓ Cultures that are too trusting could be susceptible to cyberattacks. • **Approach to privacy:** ✓ Keeping digital identities private positively impacts one's cybersecurity attitude. ✓ Some people may hold back from sharing their experiences with cyberattacks.

Objective #2 – Based on Interviews in Cameroon

➢ **The influence of organisational culture on human cybersecurity behaviour:**

Cameroon	
• **Organisational environment:** ✓ Lack of cybersecurity culture in most Cameroonian companies, increasing the likelihood of cyber threats. ✓ Internal envy/jealousy may lead to the breaking of security protocols. • **Organisational policy & governance:** ✓ Limited enforcement of cybersecurity policies and regulations.	• **Training & awareness:** ✓ Some companies fail to provide cybersecurity training. • **Company structure & vision:** ✓ Lower-level employees may hold back from sharing their views in very hierarchical structures. ✓ Unclear vision and objectives hinder employees' commitment to a company's cybersecurity goals.

Objective #2 – Based on Interviews in Switzerland

➢ **The influence of organisational culture on human cybersecurity behaviour:**

Switzerland	
• **Transparent communication:** ✓ To let employees know the company's stands regarding cybersecurity. • **Maintaining a security culture:** ✓ Physical security measures ✓ Develop a cybersecurity mindset from top to bottom.	• **Authority & hierarchy:** ✓ Hierarchies increase dependency on leaders, hence negative impact. • **Training and development:** ✓ Equips employees with the right tools.

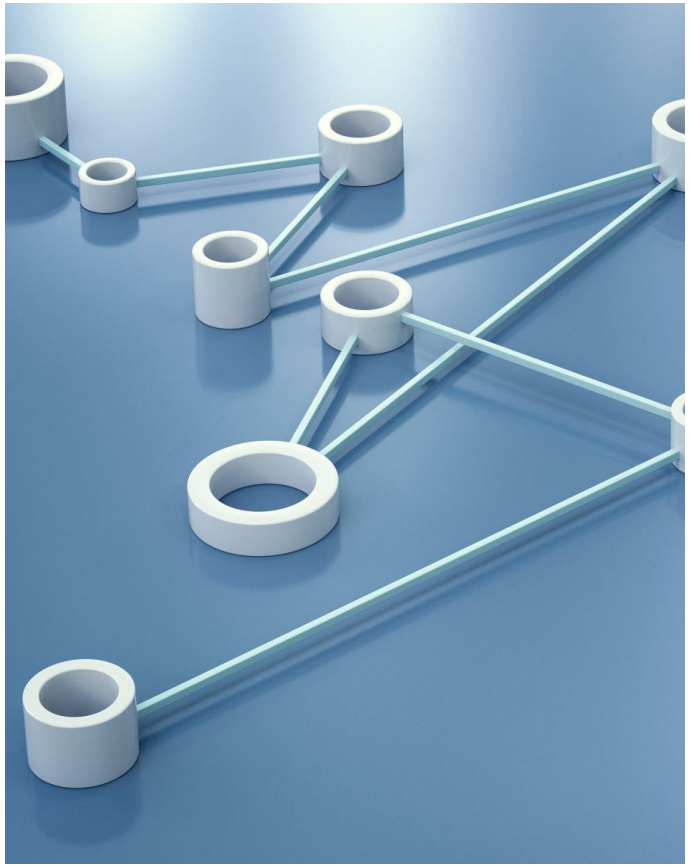
Linking Objectives 1 & 2 to Hofstede Cultural Dimensions

1. **Power Distance**:

- The existence of hierarchies influences people‘s attitudes to cybersecurity.
  - ✓ In high power-distance cultures, people in lower positions may become too dependent.
  - ✓ In low-power distance cultures, the need for consensus may slow down decision-making.

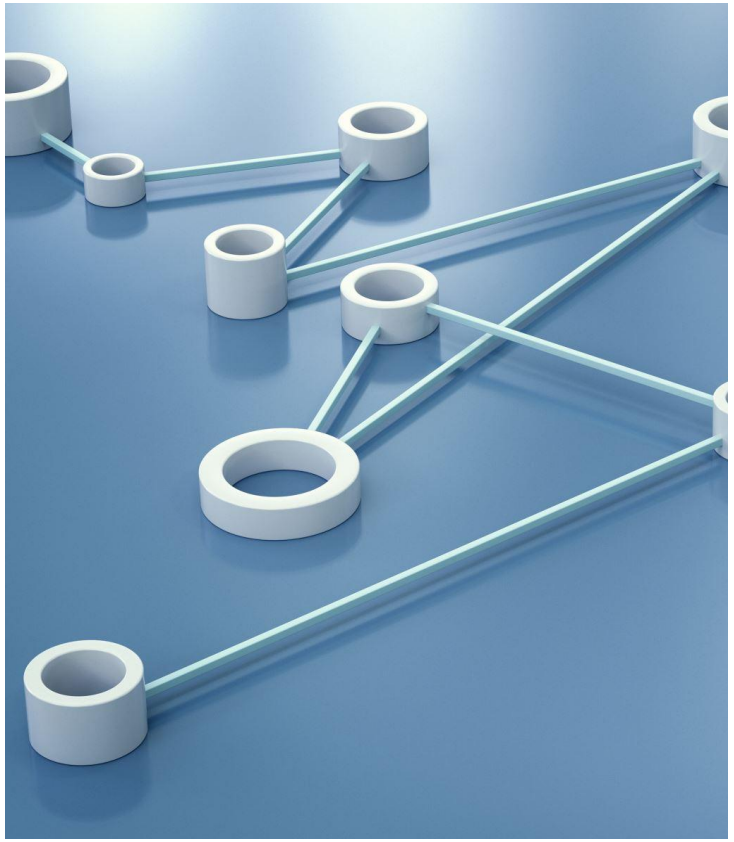
2. **Individualism / Collectivism:**

- **Collectivism**:
  - ✓ Collectivistic tendencies, such as sharing common knowledge, positively influence people’s attitudes toward cybersecurity.
  - ✓ Trust, especially blind trust, exposes people to cyber threats.



Linking Objectives 1 & 2 to Hofstede Cultural Dimensions

- **Individualism:**
  - ✓ Knowledge of privacy leads to a positive cybersecurity attitude.
  - ✓ Prioritising individual needs above that of the group hinders the building of a cybersecurity culture.



3. Uncertainty avoidance:

- Critically assessing/ questioning the unknown breeds a positive attitude to cybersecurity.
- Resisting the unknown, especially digital security measures, increases the risks to cybersecurity.

Objective #3 – Recommendations (1/2)

➢ Integrating Cultural Elements into Cybersecurity Education

Recommendations to Educational Institutions:

- ✓ Expose cybersecurity/IT students to cultural modules and other cultures.
- ✓ Design an elective or sub-module covering culturally influenced cyberattacks, incidents, and solutions.

Recommendations to Educational Institutions & Companies:

- ✓ Recognise the role of culture in the field of cybersecurity.
- ✓ Train (cybersecurity) leaders on the cultural aspects of cybersecurity.

Recommendations to Companies

- ✓ Provide intercultural training to security/IT staff.
- ✓ Match cybersecurity training to the cultural norms influencing your organization.

Objective #3 – Recommendations (2/2)

➢ Community Building to Integrating Cultural Elements into Cybersecurity Education

We aim to foster cross-cultural exchange, enhance cybersecurity skills, and facilitate research collaboration among Swiss educators, researchers, and students with counterparts in African HEIs.

Project Sponsor: Movetia International Programme

Project Duration: 18 months (Sept 24 – Mar 26)

Number of Partners: 10 partners (5 African partners and 5 Swiss partners)

Expected Impact:

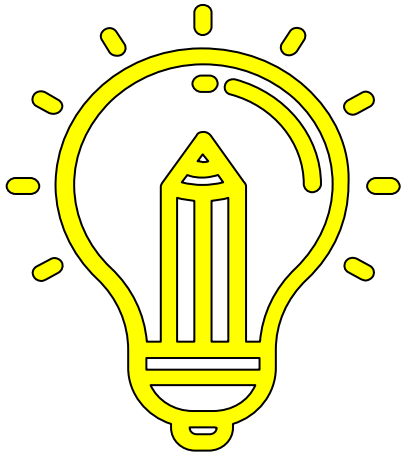
- Enhanced cybersecurity competencies
- Development of cross-cultural competencies
- Improvement of cybersecurity curriculums

07

CONCLUSION & AREAS FOR FURTHER RESEARCH

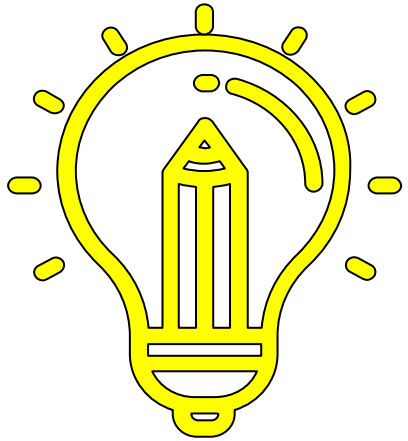
Conclusion

- Addition to the discussion on cybersecurity and culture
  - ✓ New findings relating to culture and individual cybersecurity behaviour.
  - ✓ Recommendations on how to integrate culture into cybersecurity education and training.
- Policymakers can use our findings when designing and enforcing cybersecurity policies.



Areas For Further Research

- **Focus on the same topic and research questions**
  - ✓ Adopt a quantitative approach to test the findings.
  - ✓ Consider participants from more regions in Cameroon and Switzerland.
  - ✓ Research the applicability of the recommendations and how to design a module that links culture and cybersecurity.



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