Trust, Technological Competency and Performance of Virtual Project Teams in the New Normal

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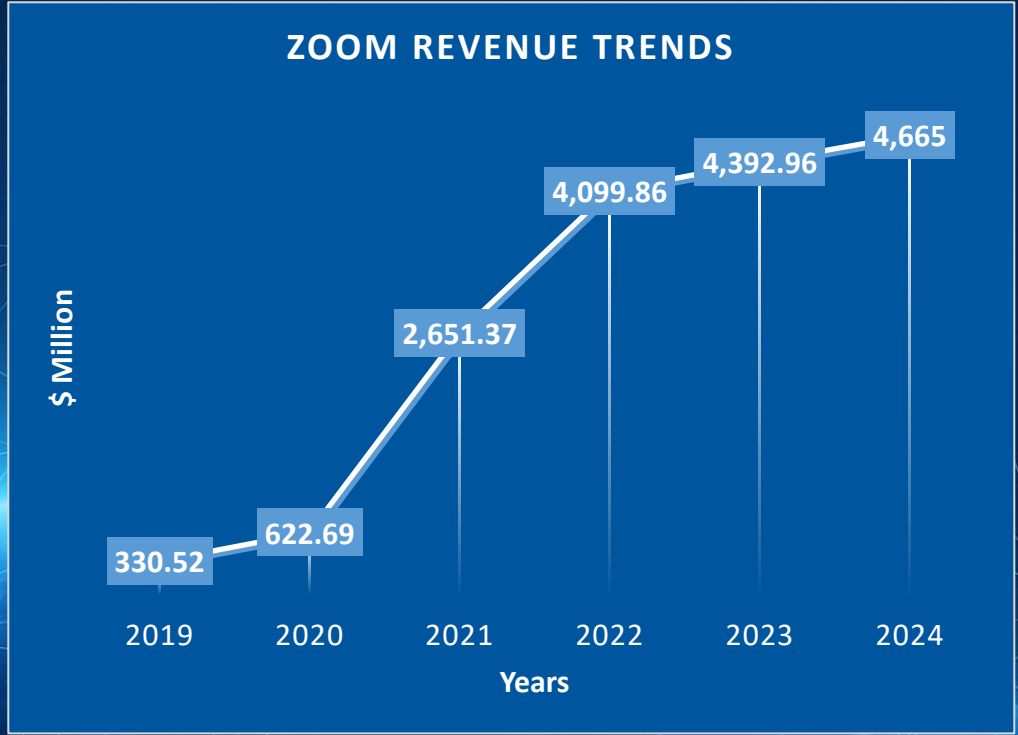
Motivation

64% of organizations say that the shift to virtual team will be permanent (Meluso et al., 2020)



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Motivation

- Businesses in the new normal are turning to virtual teams
- One of the critical factors influencing the team performance is trust, which is more challenging in virtual teams
- More difficulties in building trust when consider the project nature of the built environment industry
- There is a digital divide among multiple stakeholders with low technological competency in the built environment industry

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Research Gaps

- Lack of understanding of trust building in virtual project teams, especially in the built environment industry
- Lack of research on relationship between trust, technological competency and performance in virtual project teams
- Lack of an integrated system for assessing and improving technological competency and trust of virtual project teams

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Objectives

Identify Significant Factors affecting trust building in virtual project teams (VPTs)

Develop Theoretical Frameworks linking trust, technological competency and performance

Develop a Trust and Technological Competency Analytics and Innovations System

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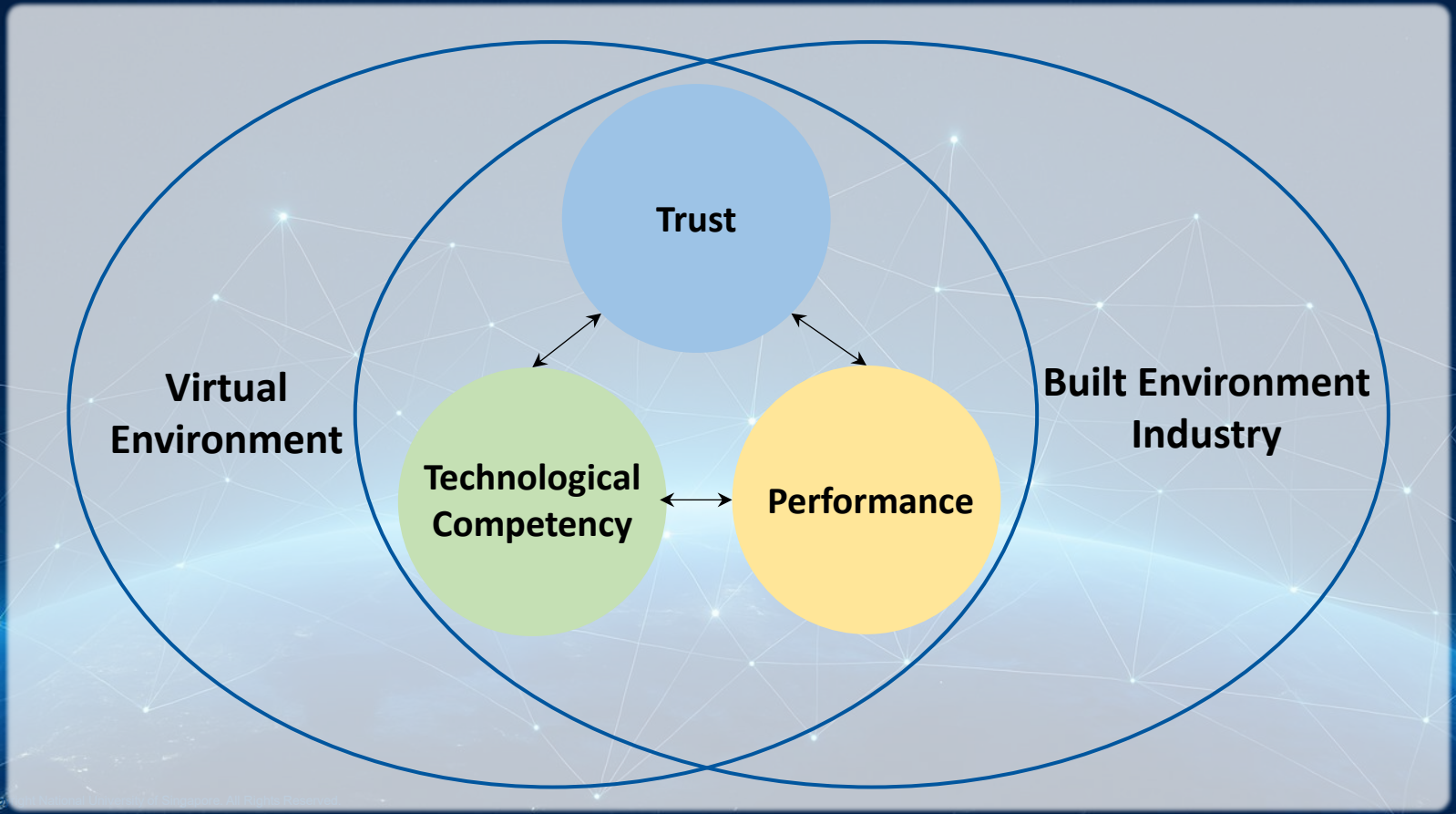
Research Scope



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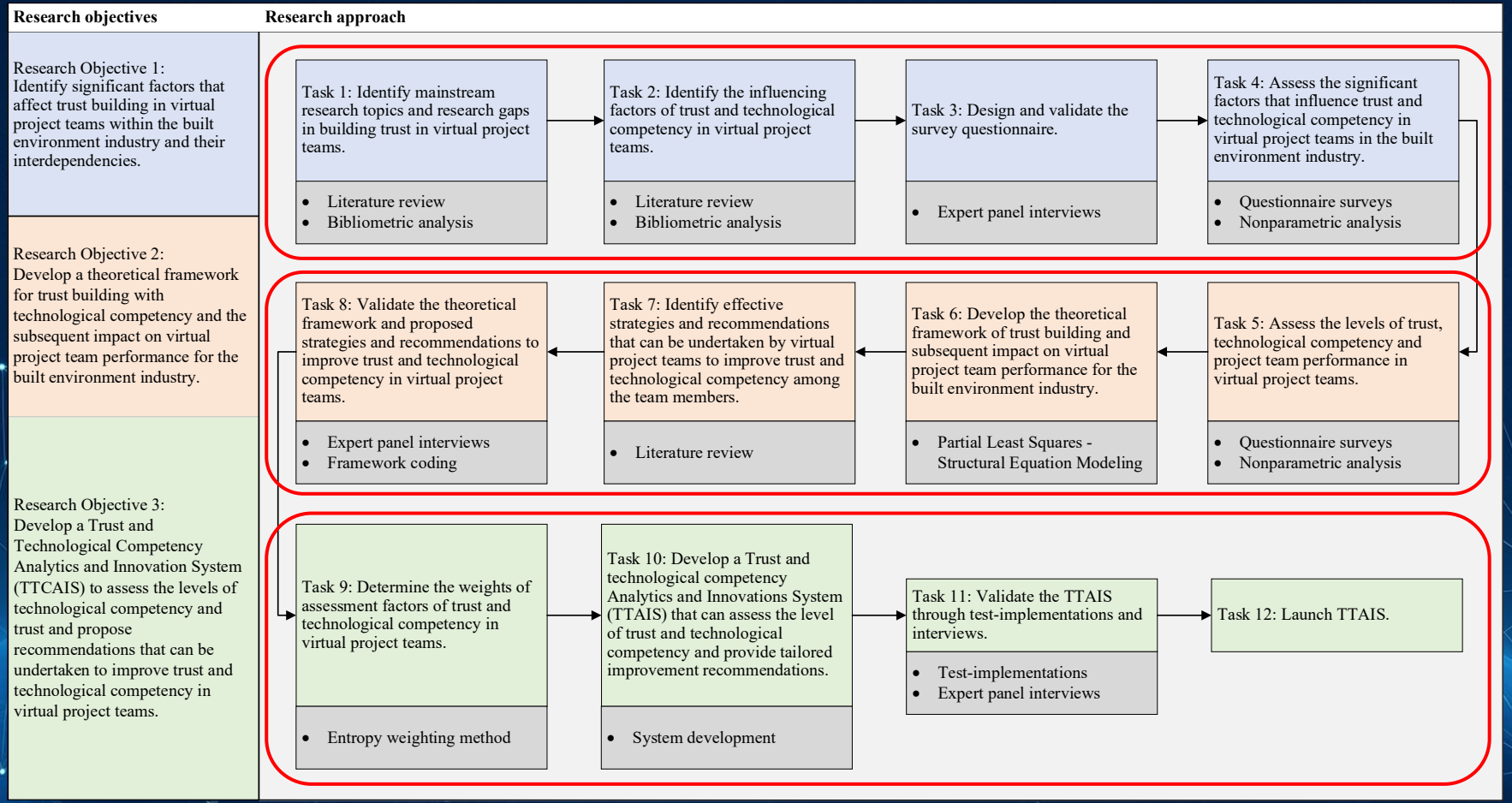
Research Approach



Factors Identification

Objective 1

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Trust Influencing Factors

Individual-Related Factors

Reliability
Benevolence
Empathy
……

Project Team-Related Factors

Team's Knowledge Sharing
Power of Team
Shared Values
……

Organization-Related Factors

Organizational Culture
Organizational Structure
Support of Senior Management
……

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Technological Competency

Knowledge

Project Integration Mangement
Project Scope Management
Knowledge in Virtual Teams
……

Skills

Communication
Information Management
Team Building
……

Personal Attributes

Personal Characteristics

Attitude towards Technology

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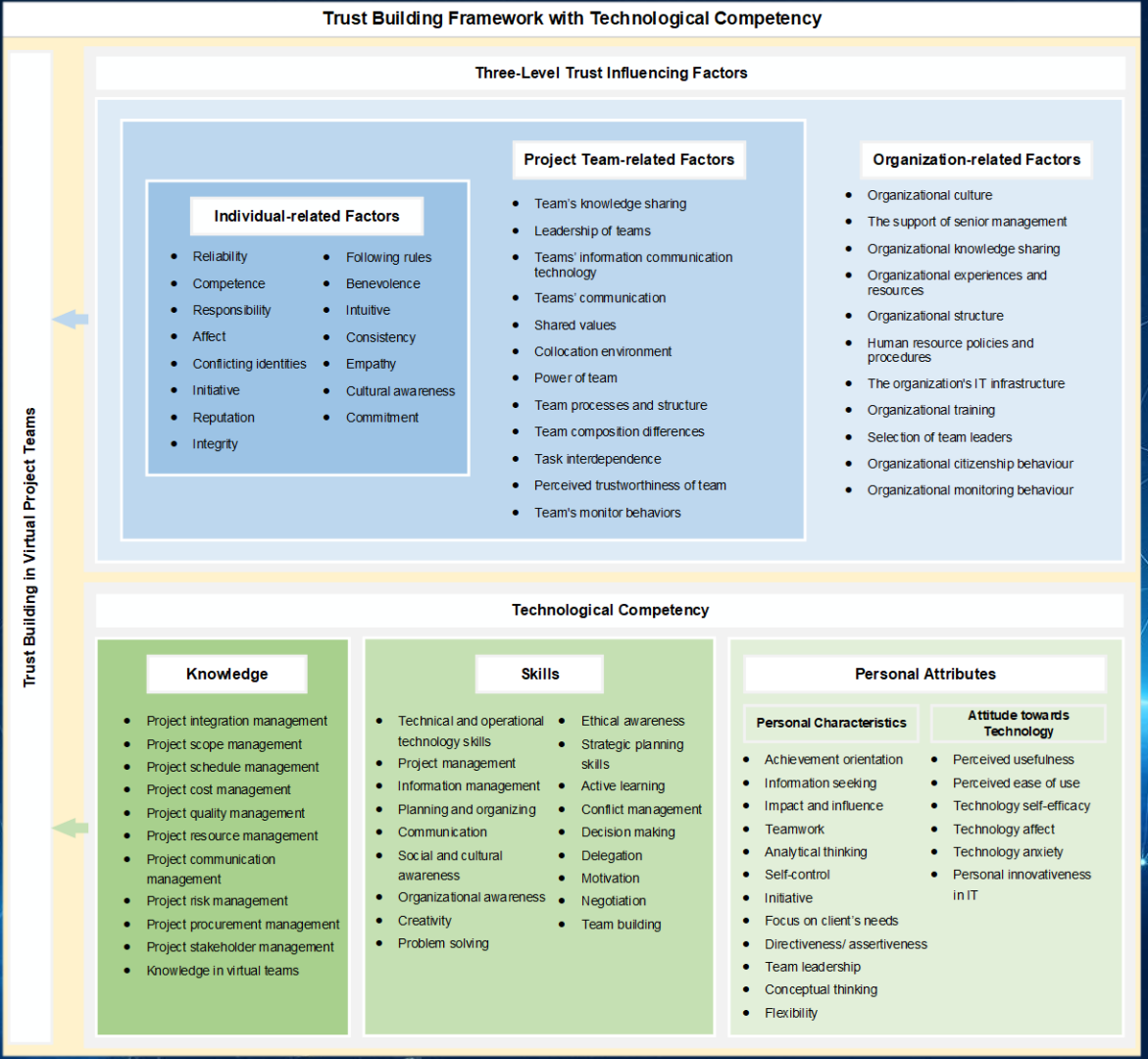

Trust Building Framework with Technological Competency

Top Factors
Influencing Trust in VPTs

Organization-Related Factors

- The organization's IT infrastructure
- Organizational monitoring behaviour
- Organizational training

Project Team-Related Factors

- Teams' communication
- Teams' information communication technology
- Team's knowledge sharing

Individual-Related Factors

- Commitment
- Following rules
- Consistency

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Top Factors
of Technological Competency in VPTs

Knowledge	Skills	Personal Characteristics
• Project communication management	• Motivation	• Flexibility
• Knowledge in virtual teams	• Planning and organizing	• Conceptual thinking
• Project cost management	• Negotiation	• Team leadership

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Differences

Team Differences

Virtual Project Teams

VS

Traditional Face-to-Face Project Teams

More Significantly Important Factors Compared to Traditional Project Teams

- The organization's IT infrastructure
- Knowledge in virtual teams

Respondent Differences

- Designation
- Age
- Gender
- Education
- Years of Experience

Organization Differences

- Type
- Size

Factors with Differences

- Knowledge in virtual teams
- Organizational knowledge sharing

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Framework Development

Objective 2

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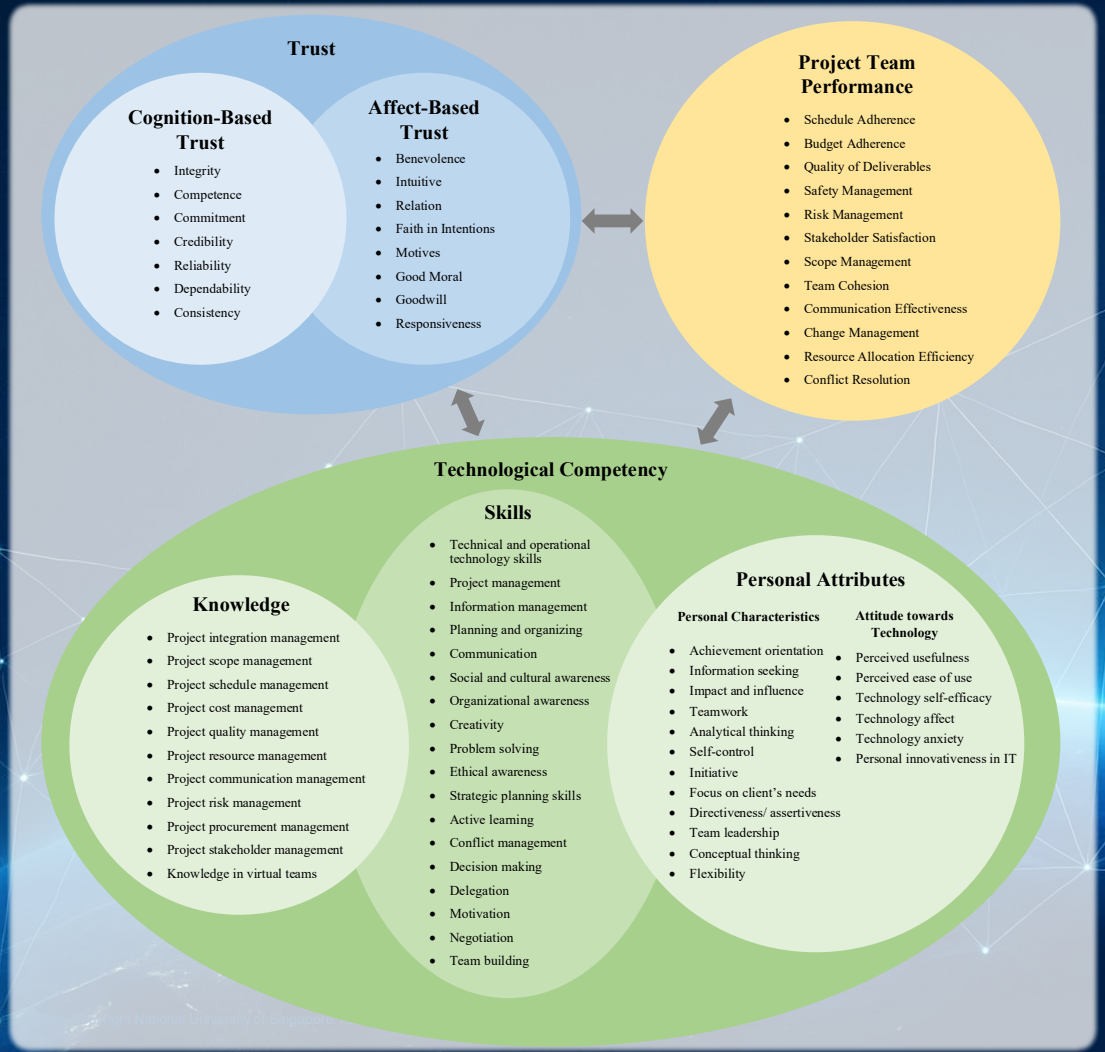

Assessment Factors

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Differences

Virtual Project Teams

VS

Traditional Face-to-Face Project Teams

Trust ↓

Technological Competency ↓

Performance

Virtual Project Teams

Performance	Significance in the Level of VPTs
Scope Management	+
Change Management	+
Resource Allocation Efficiency	+
Conflict Resolution	+

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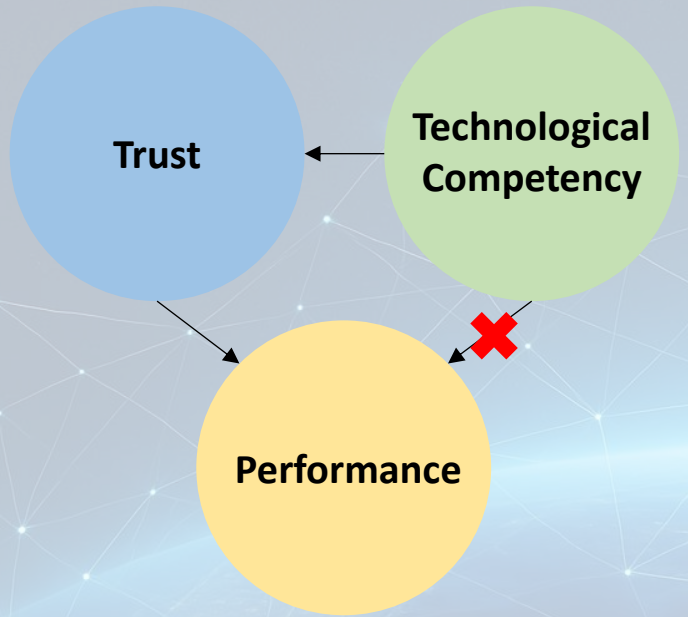
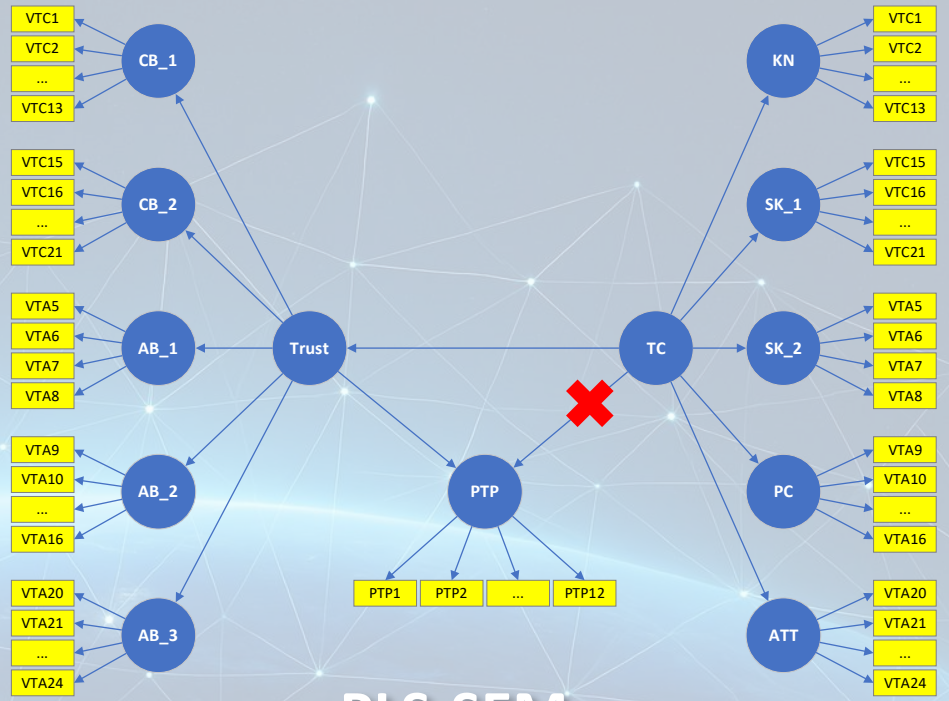
Relationship



Hypothesis



PLS-SEM

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Competency-Driven Trust and Performance Framework

System Development

Objective 3

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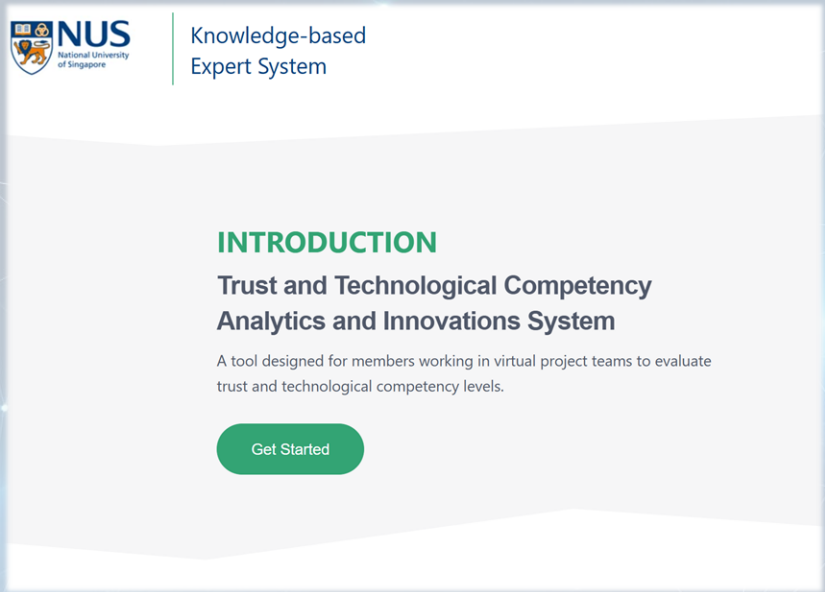
System Development

Trust and Technological Competency Analytics and Innovations System (TTCAIS)



❑ Purpose

- **Assess** the level of trust and technological competency
- **Propose** Improvement recommendations

❑ Benefits

- Provide users' organizations and project teams with **data-driven insights** to enhance collaboration and performance in virtual environments

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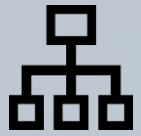
System Development

❑ Component



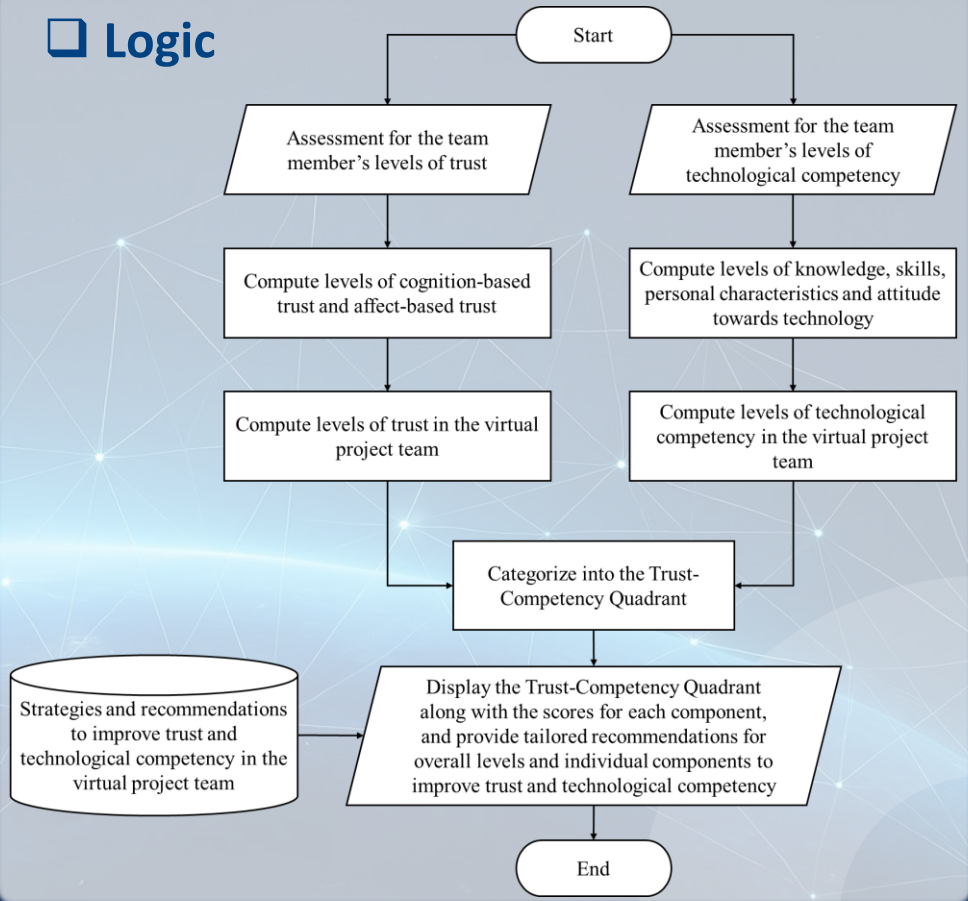
Assessment Framework

Decision Support System (DSS)

Graphical User Interface (GUI)

Knowledge-Based System (KBS)

❑ Logic



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System Development

NUS National University of Singapore | Knowledge-based Expert System

Product Resource About User Info Sign out

INTRODUCTION

Trust and Technological Competency Analytics and Innovations System

A tool designed for members working in virtual project teams to evaluate trust and technological competency levels.

Get Started

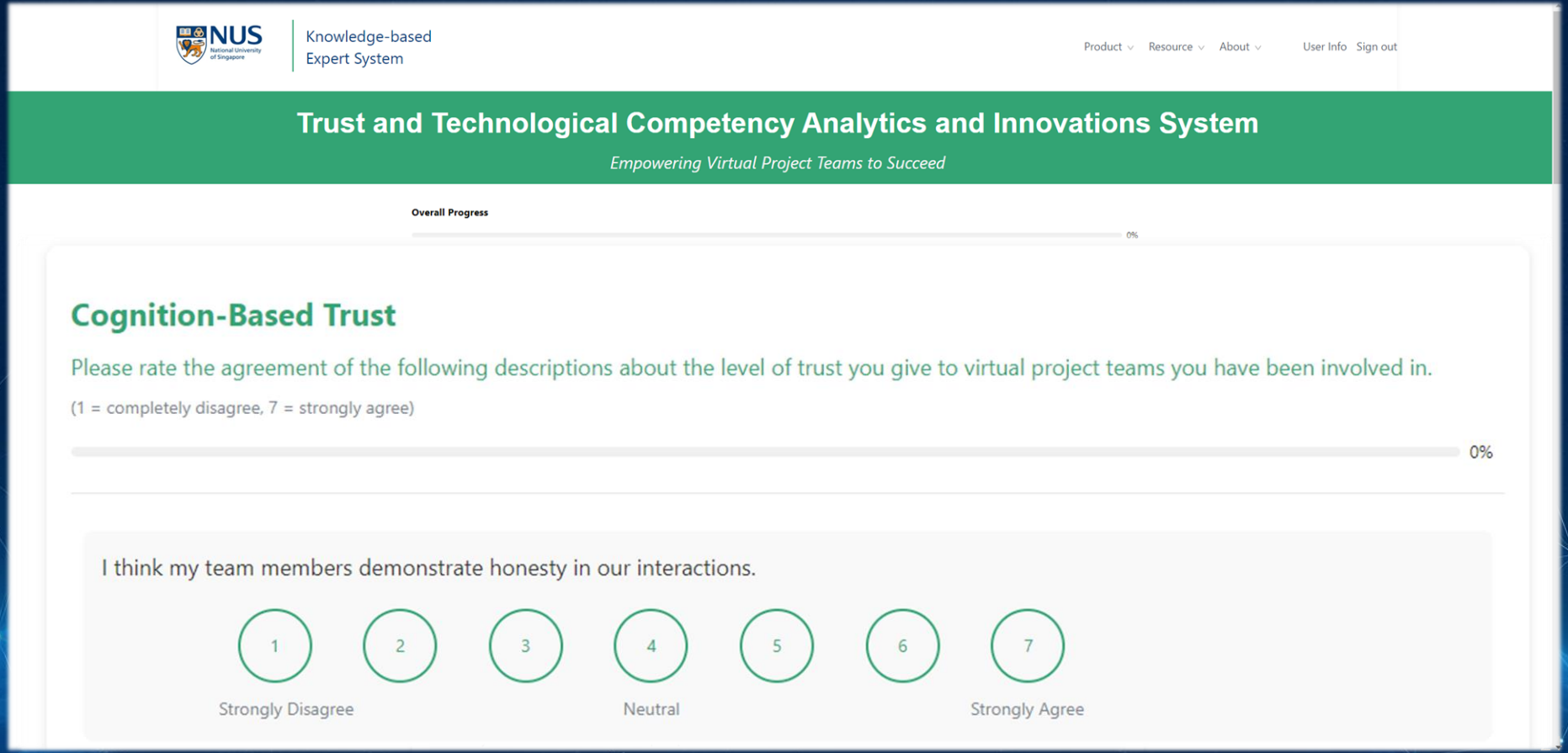
Introduction

Trust and Technological Competency Analytics and Innovations System is a tool designed for members working in virtual project teams. This system evaluates the levels of trust and technological competency within project teams and provides tailored action plans to enhance these critical factors in virtual collaboration.

Background

With the development of smart technologies and the rise of digital transformation, AI-driven collaboration and flexible work arrangements, the built environment industry is undergoing a major transformation. Organizations are increasingly adopting hybrid and remote work models, making the success of virtual

System Development

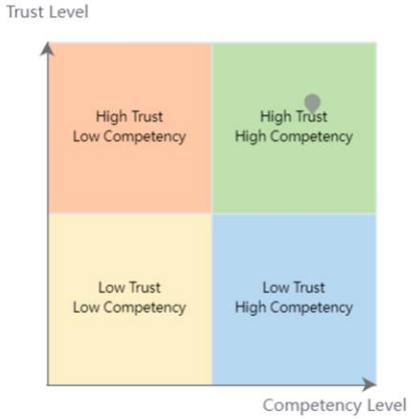


System Development

Overall Trust and Competency Level

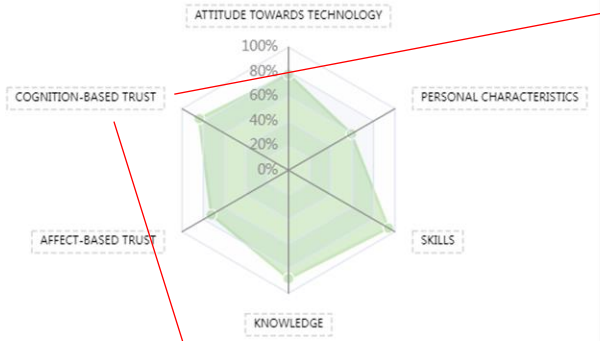
High Trust - High Competency

Trust score	Competency score
77.96%	80.71%



What Can You Do to Improve?

Scoring of Trust and Competency Components



Key Sub-Factors to Focus On

I think my team members adhere to ethical principles.
42.86% Q3

I think my team members demonstrate honesty in our interactions.
57.14% Q2

I think my team members keep their promises.
71.43% Q2

Recommendations

for Cognition-Based Trust

- Conduct regular retrospectives to help members analyze their behaviors and their impact on trust.

- Implement dynamic role rotation to enhance awareness of others' capabilities.

- Encourage members to document and share their perceptions of others' behavioral patterns to enhance mutual understanding and trust.

- Establish a mentorship system where experienced members guide others in trust development.

- Provide cross-cultural training to expand members' cognitive schemas and better understand diverse behaviors.

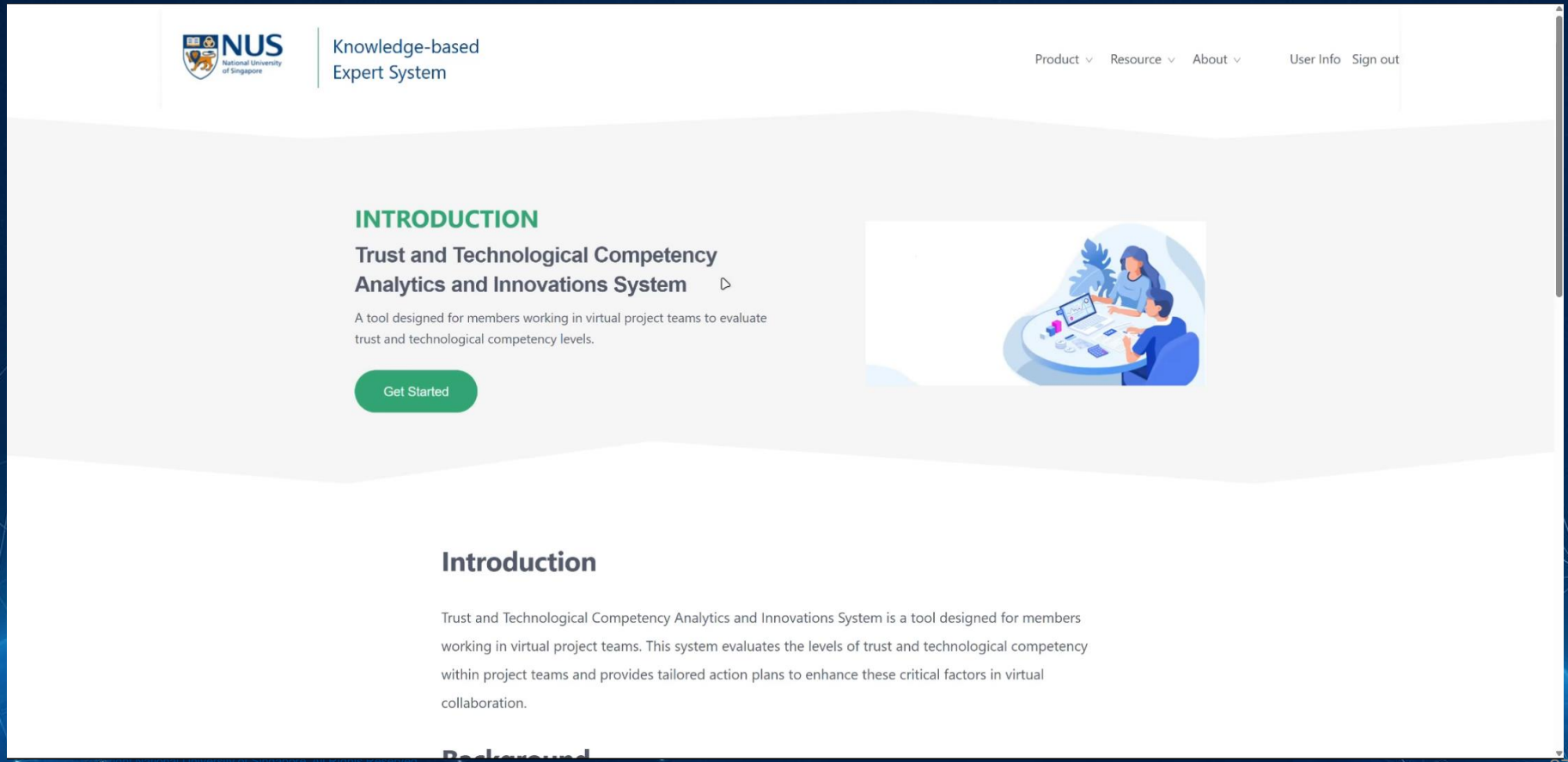
Overall Recommendations

System Development

Overall Recommendations

- Strengthen peer-learning programs where experienced team members act as mentors, supporting the continuous development of both trust and competency.
- Leverage AI-driven project management, predictive analytics, and automation tools to further enhance decision-making efficiency.
- Maintain transparent feedback mechanisms, such as periodic team reflections and competency assessments, to ensure continuous growth.
- Engage with external experts, industry leaders, or academic institutions to keep the team at the forefront of digital competency and trust-building methodologies.
- Standardize best practices in a shared knowledge repository and develop structured onboarding processes for new members to sustain high performance.

System Development



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Contribution and Recommendation

Knowledge and Practices

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Contributions

Contributions to Knowledge

- ❑ Extends trust building models in VPTs
- ❑ Investigates the interrelationship
- ❑ Addresses unique challenges

Contributions to Practices

- ❑ Provides a practical tool
- ❑ Supports training to reduce digital divide
- ❑ Offers strategies for building trust
- ❑ The findings can be extended to other sectors

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Recommendations to the Industry

Strength Trust in VPTs

- ❑ Invest in **robust IT infrastructure** to support seamless collaboration
- ❑ Establish **transparent monitoring and communication mechanisms**
- ❑ Promote **knowledge sharing platforms** to enhance team reliability

Enhance Technological Competency in VPTs

- ❑ Provide training on **virtual project management, cost control, and collaboration tools**
- ❑ Develop **motivation, planning, organizing, and negotiation skills** among team members
- ❑ Foster **digital leadership** to guide teams through technological transitions

Leverage TTCAIS for Continuous Improvement

- ❑ Assess **trust and competency levels** using TTCAIS
- ❑ Receive **tailored improvement recommendations** for targeted trust and competency building
- ❑ Use the **knowledge base** to adopt best practices and accelerate digital transformation

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