Adoption and diffusion of cloud computing in the public sector – A case study of Zambia

Shuller Habeenzu

ITMC/RIA Focal Point-Lusaka

Zambia : A brief Overview

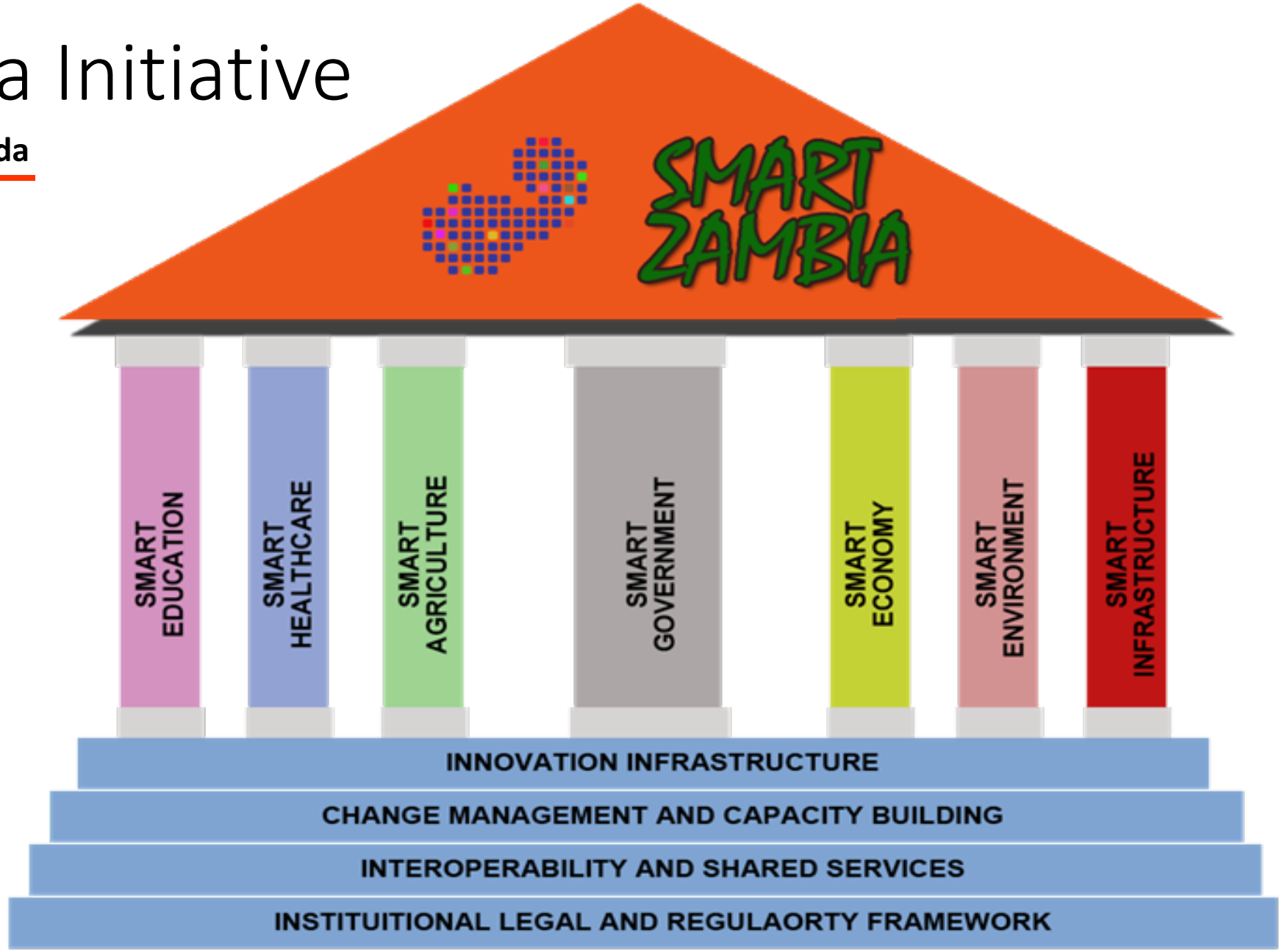
- Rapid and youthful population growth
- Poverty levels deepening in rural areas – high Gini coefficient
- Increasing budgetary constraints to meet social needs
  - Lack of fiscal discipline – unknown external debt exposure
  - Significant fiscal deficits
  - Government introduces excise duty on data bundles sept 2017 (same as airtime)
- Increasingly, government required to deliver more for less

Smart Zambia Initiative (launched Dec 2015)

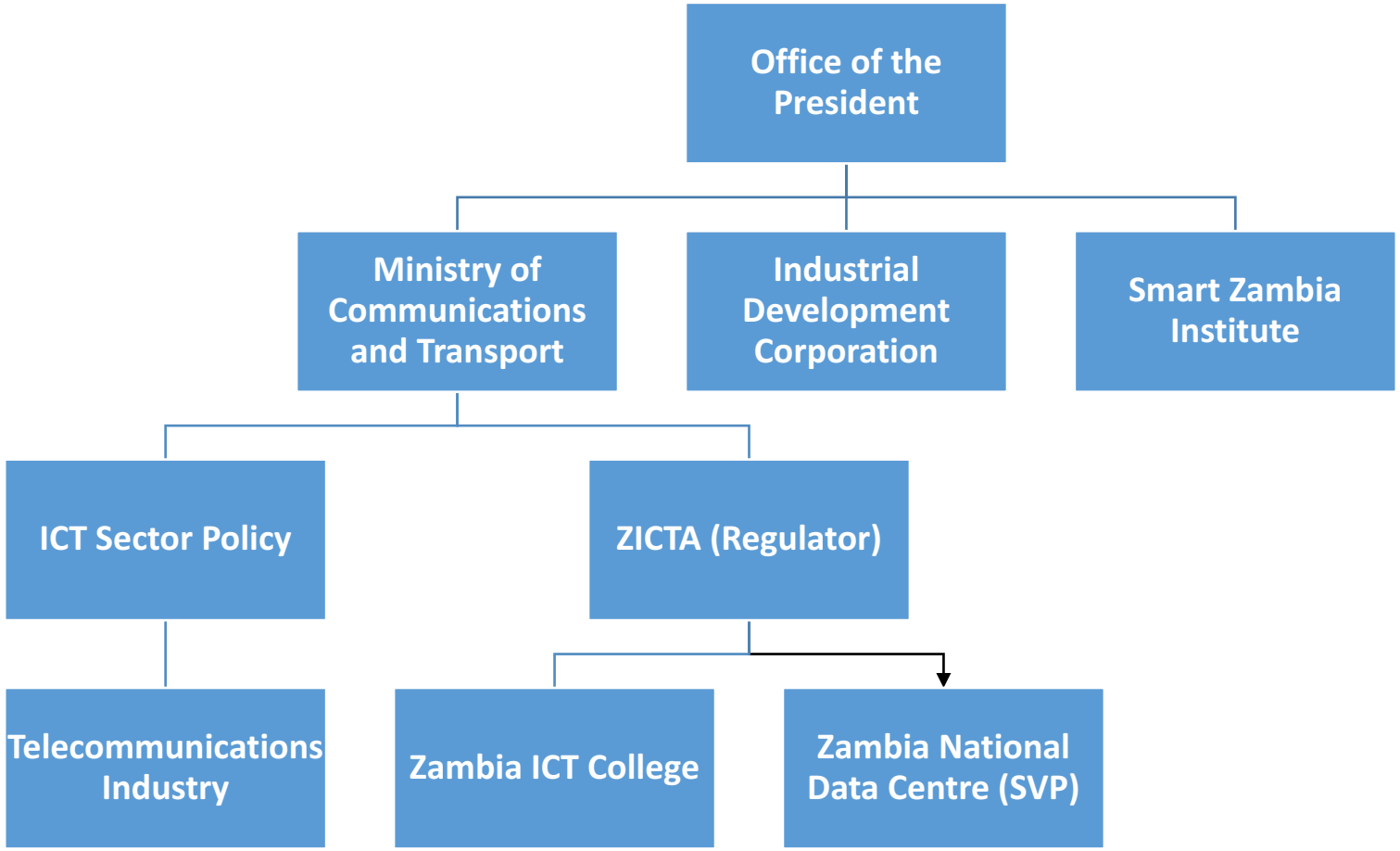
Vision	A prosperous and globally competitive knowledge based developed country by 2064			
Mission Statement	To provide relevant and transparent e-services to the Zambian people using affordable and available Information Communication Technologies for the attainment of a smart Zambia.			
Strategic Thrust	Build extensive Network & ICT Infrastructure	Implement ICT applications in all sectors of the economy	Improve socio welfare,stability and prosperity of Zambia	Support local industry development through industrial parks

Smart Zambia Initiative

A Digital Transformation Agenda



Smart Zambia Institute – to coordinate SZ



Cloud Computing Platform

- Smart Zambia Initiative is predicated on cloud computing
- Zambia National Data Centre to host the government cloud
- No definitive budget figures (part of an estimated cost US$65m debt financed package) for Smart Zambia Phase 1
- Smart Zambia Phase 2 –
  - extending national backbone and metros to all districts (lowest government administrative centres)
  - Address digital-divide: Roll-out 1000+ LTE base stations by 2012 (through state-owned Zamtel)
- Government favours big-bang approach rather than gradual progression

Research Objectives

- Highly useful for policy makers
  - to gain insights into the diffusion patterns of cloud computing in the public sector in Zambia.
  - To provide the much needed research support for ongoing cloud computing implementations in Zambia and other developing countries (action research).

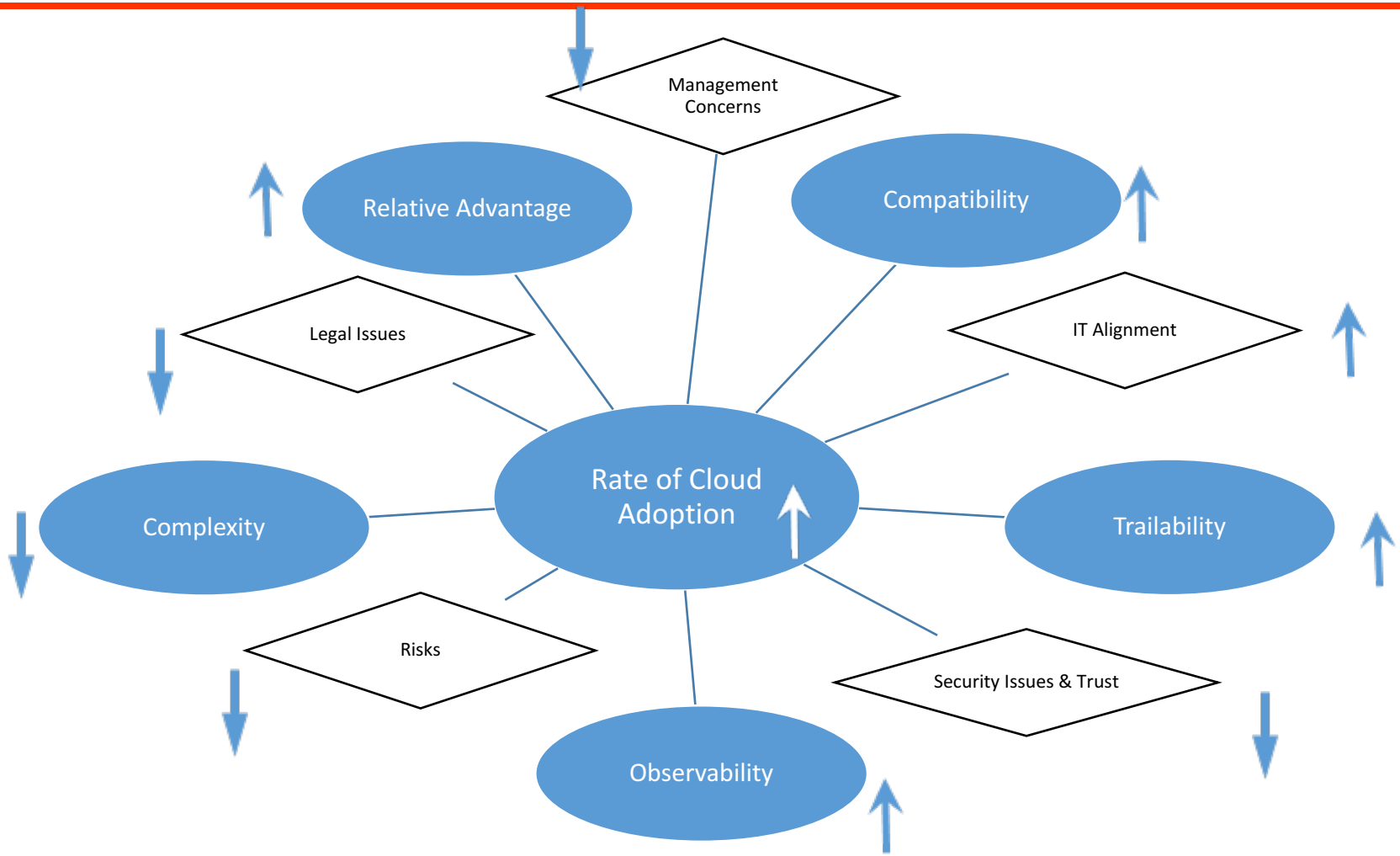
Research Questions

- What are the contextual factors that are influencing the adoption and usage of cloud computing (in the public sector public sector) in Zambia and in which way? (predictive)
- What policy or strategy interventions that need to be considered to induce adoption of cloud computing in Zambia? (action research)

Literature Review

- Most studies have explore the importance of the technological factors affecting cloud computing adoption.
- However, the influences of environmental and organisational factors on cloud computing adoption vary across different environments.
- Therefore, there is a need to analyse the determinants of cloud computing adoption in different sectors to acquire a better understanding of cloud computing adoption.
- Feasible to apply the Rogers' DOI theory and technology-organisation-environment (TOE) framework to explore the cloud computing adoption.

Rogers' Theory of Innovation and TOE Model

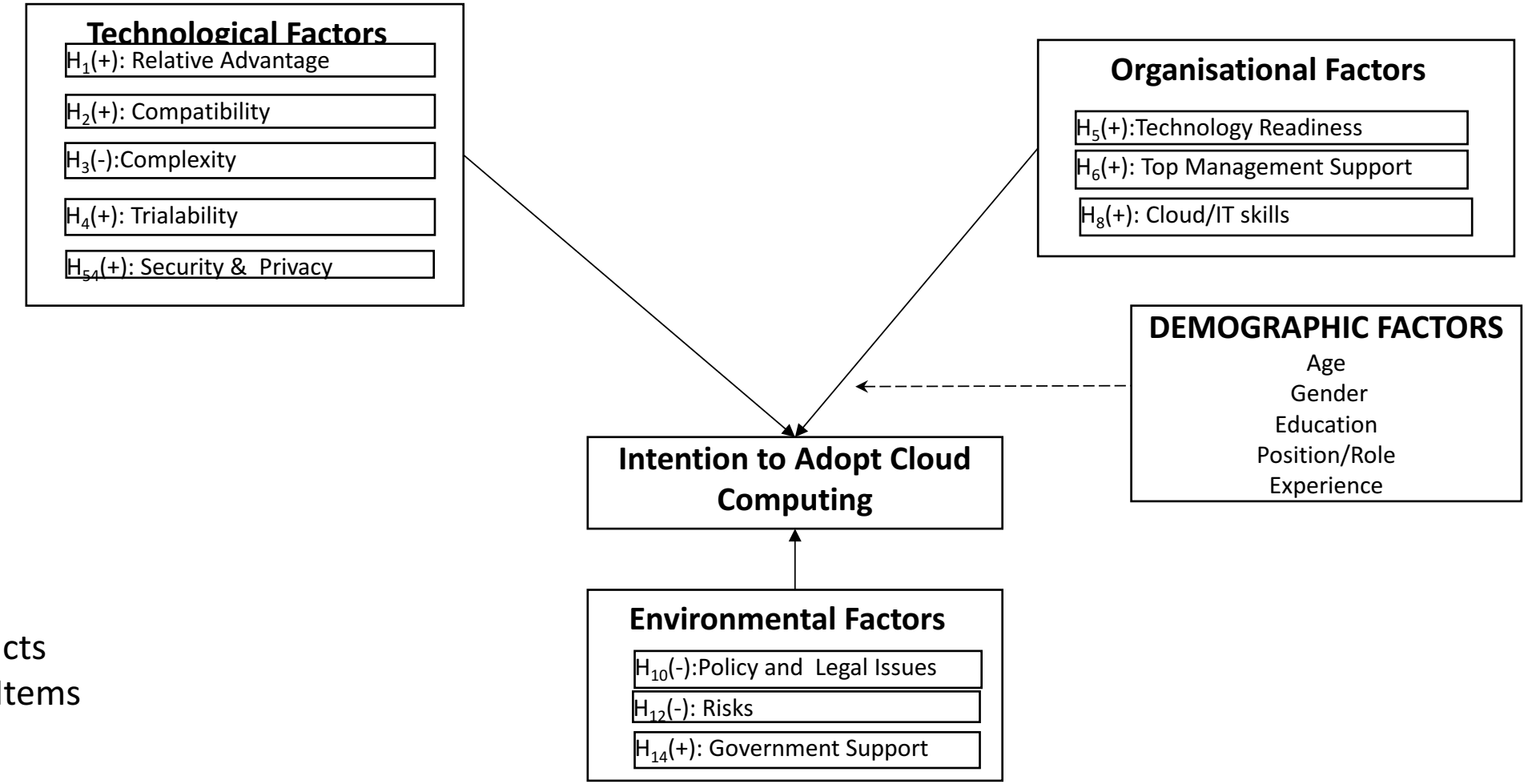


Theoretical and empirical factors operating on the rate of adoption. [Adapted from (Kuiper et al. 2014)]

Approach

- Cloud Computing is a nascent industry in the public sector
  - Complex adaptive system
  - Lack of historical data or perspective - limited experience and data
- Technology Adoption/acceptance Theories
  - Rogers' Theory of Diffusion of Innovation (DOI)
  - Technology, Organisation and Environment (TOE) &
- Exploratory and predictive approach
- Structural equation modelling - a multivariate statistical analysis technique used to analyse **structural** relationships between measured variables and latent constructs.

Proposed Research Model & Hypotheses



11 Constructs
45 Survey Items

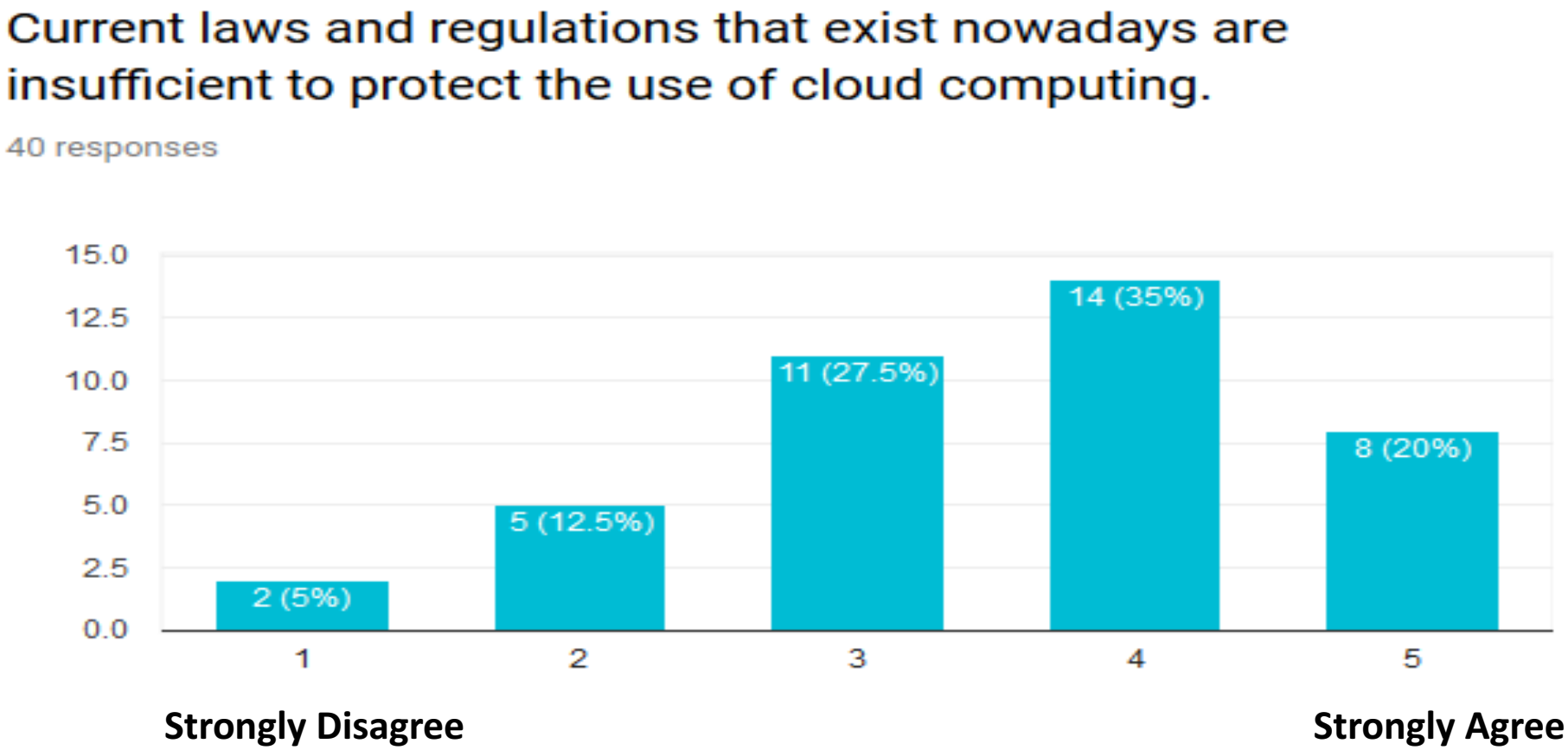
Data Collection and Analysis

- Face-to-face Interviews with Smart Zambia senior management
- Structured Questionnaire – Sample population drawn from Smart Zambia technical staff
- Data collection (and validation) - an ongoing process
- Preliminary descriptive data analysis -

Selected preliminary findings

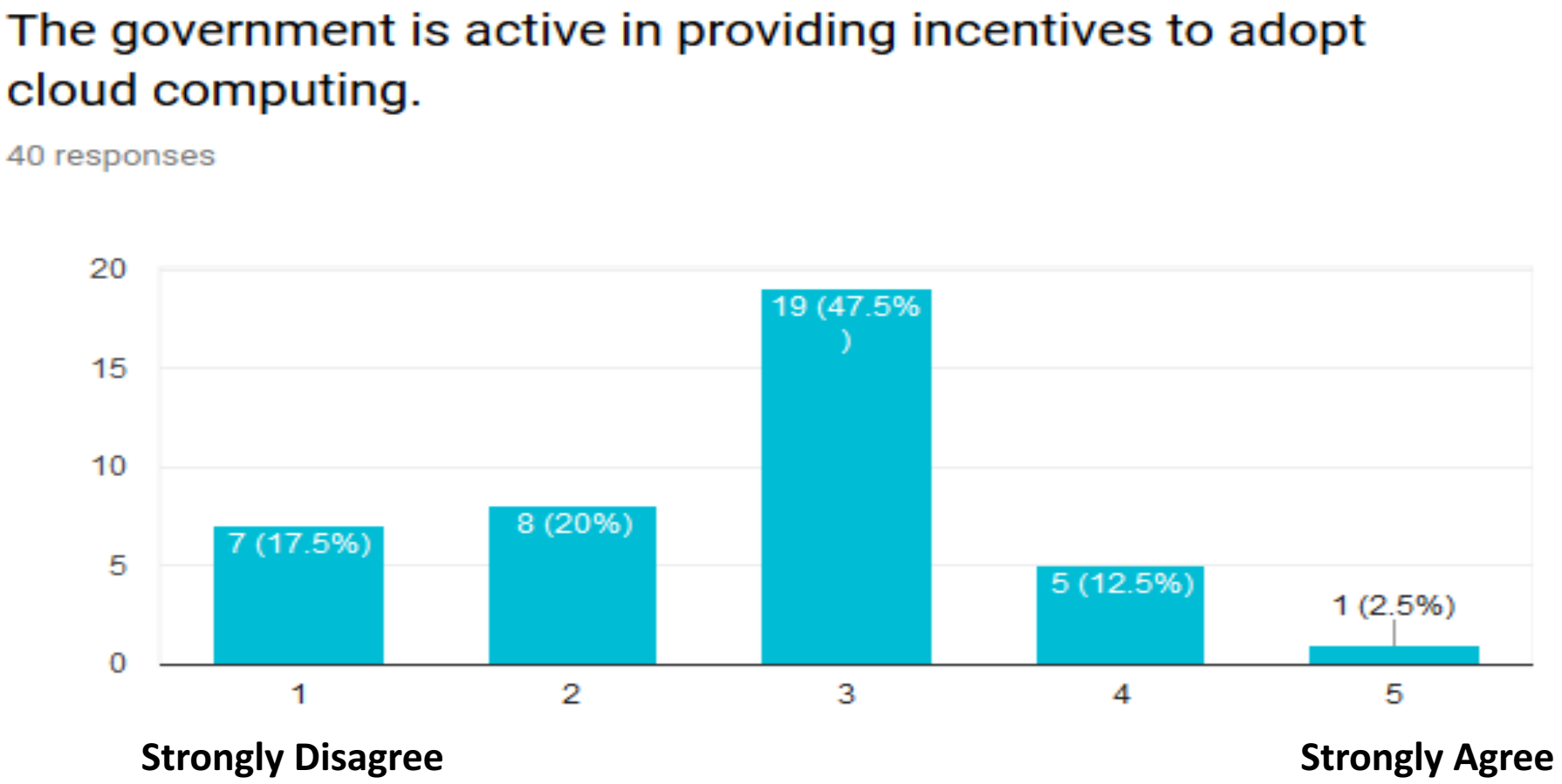
- Perceived Challenges by Smart Zambia Management:
  - Sustainability –
    - Draft Policy Framework : Lack of policy framework (no public documentation on Smart Zambia)
    - Funding – based on external funding –unknown budget
    - Procurement – single sourcing and non-transparency
    - Technical obsolesce /lock-in
    - Human Resource Capacity constraints -(60% of key staff above 41 years or above)
    - Lack of business case analysis (top down command structure)

Policy and regulatory frameworks

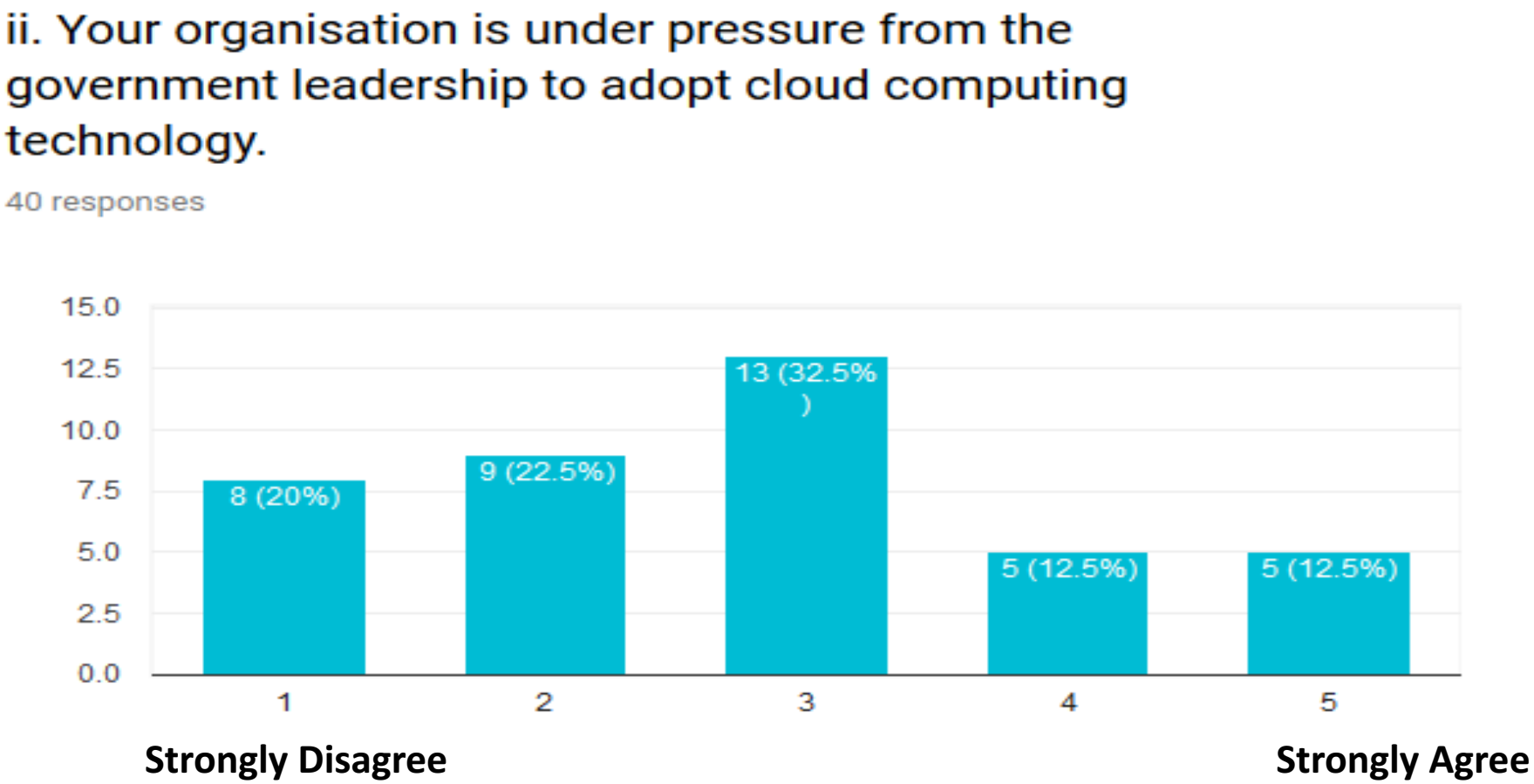


Lack of Policy and privacy laws

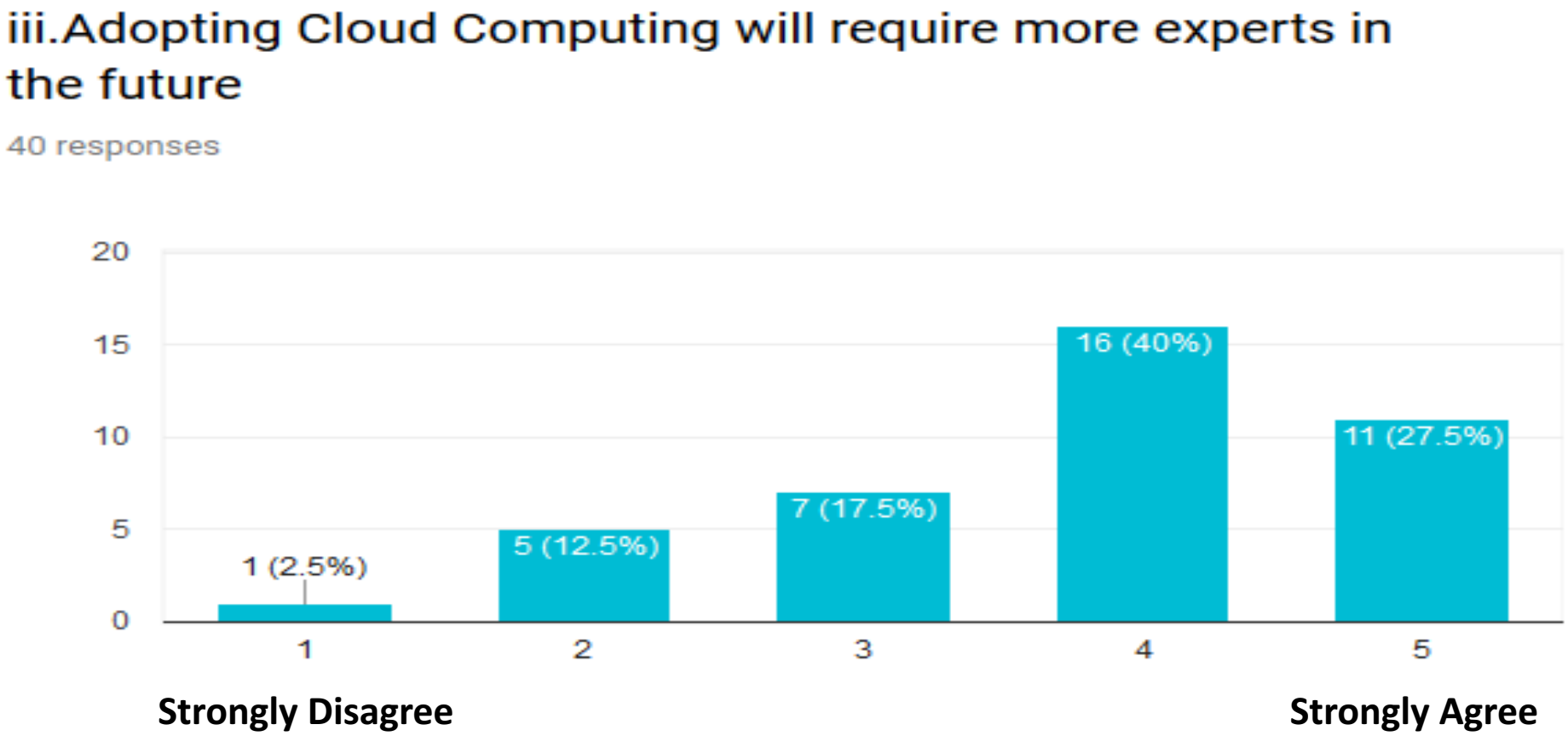
Incentives to adopt



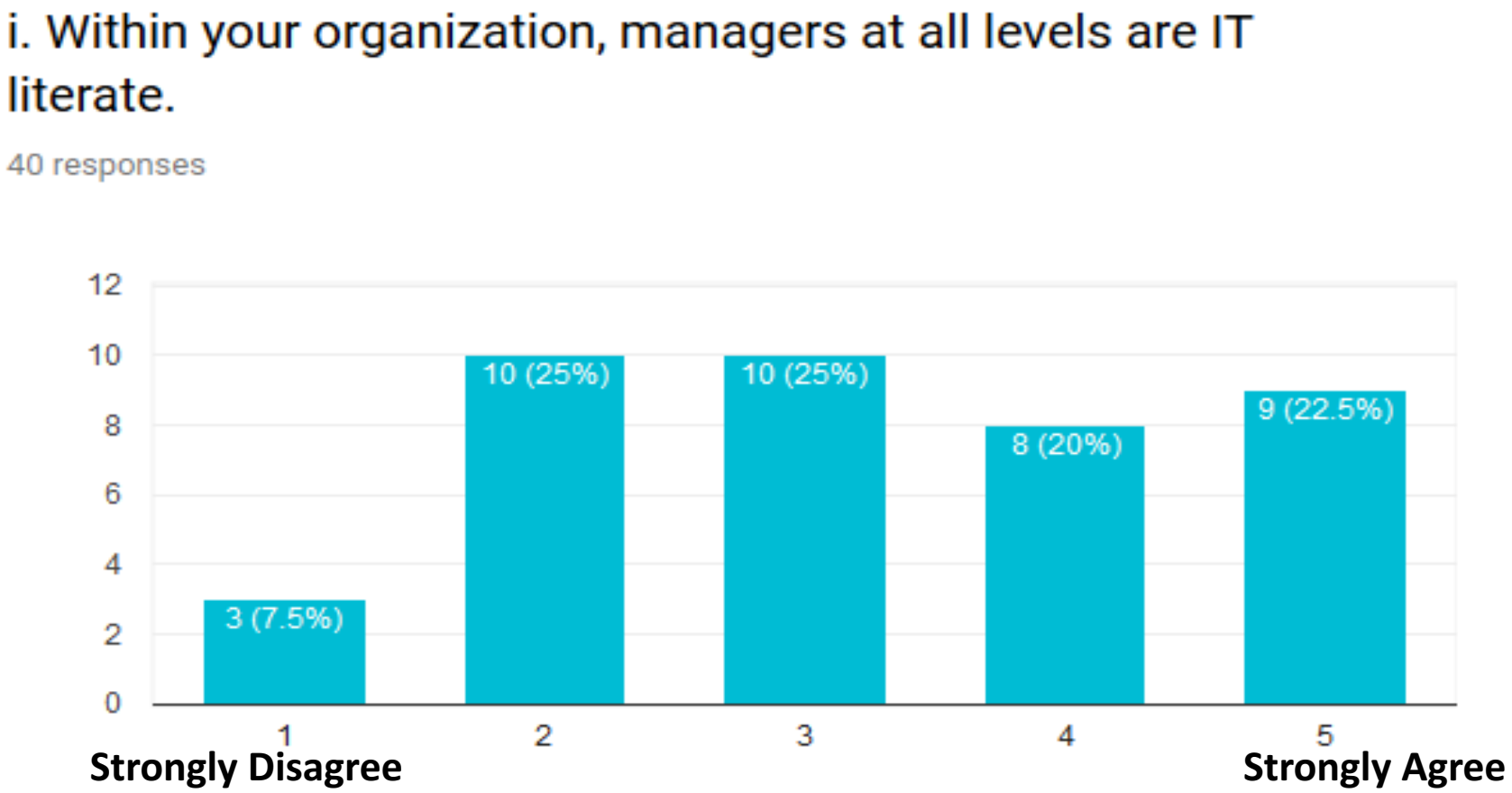
Pressure to adopt cloud computing



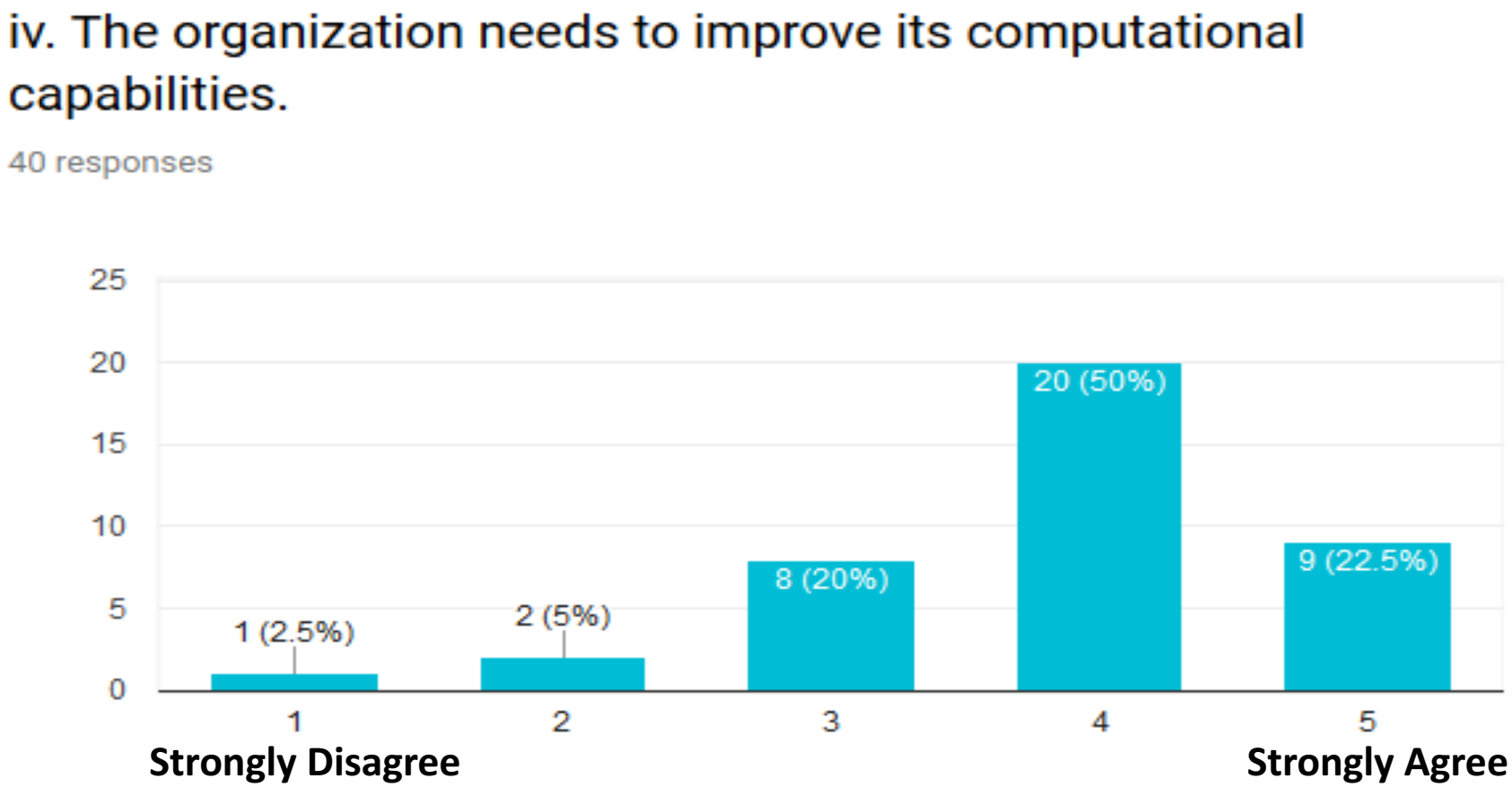
Job Opportunities



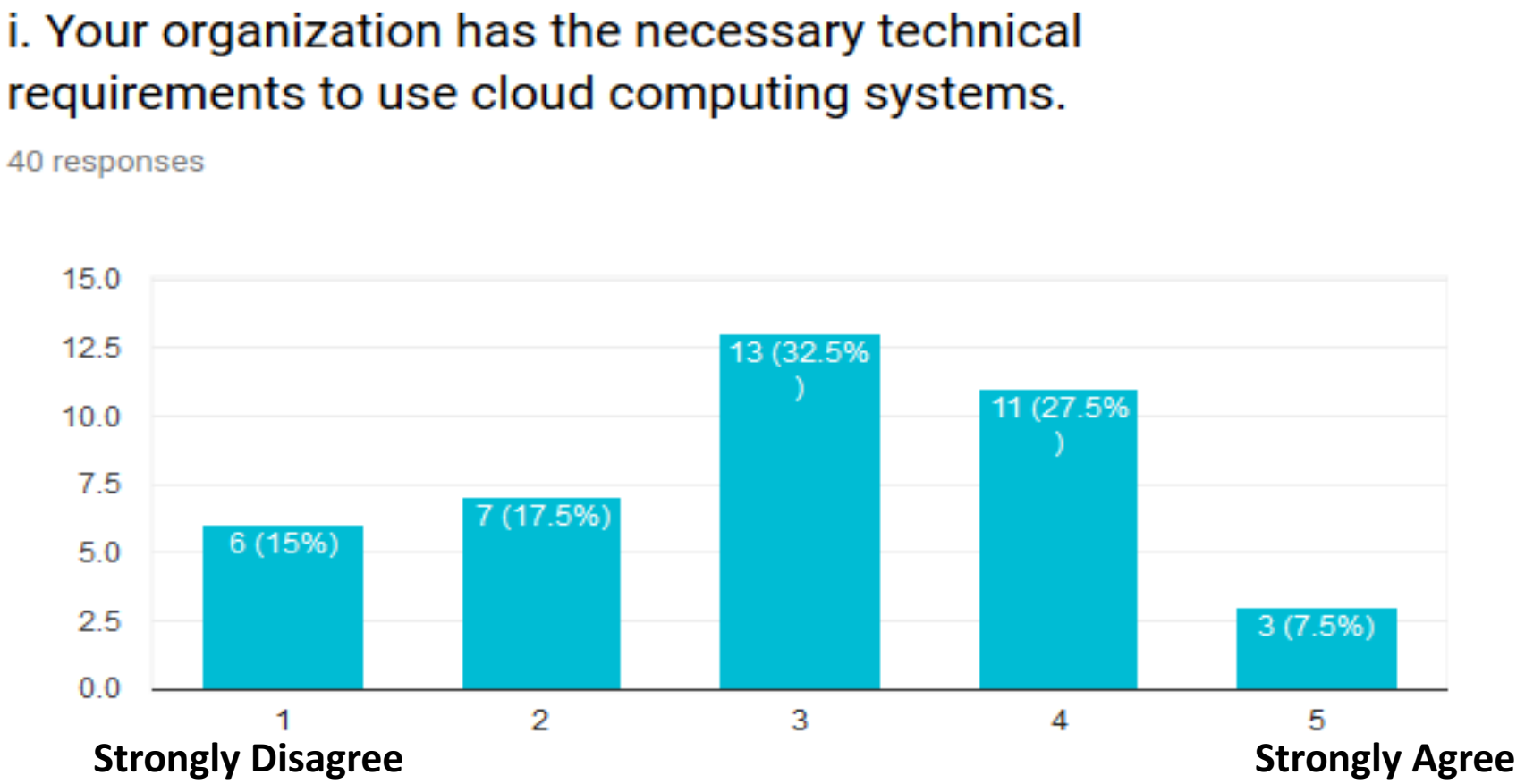
Leadership


i. Within your organization, managers at all levels are IT literate.
40 responses
12
10
8
6
4
2
0
3 (7.5%)
10 (25%)
10 (25%)
8 (20%)
9 (22.5%)
1
2
3
4
5
Strongly Disagree
Strongly Agree

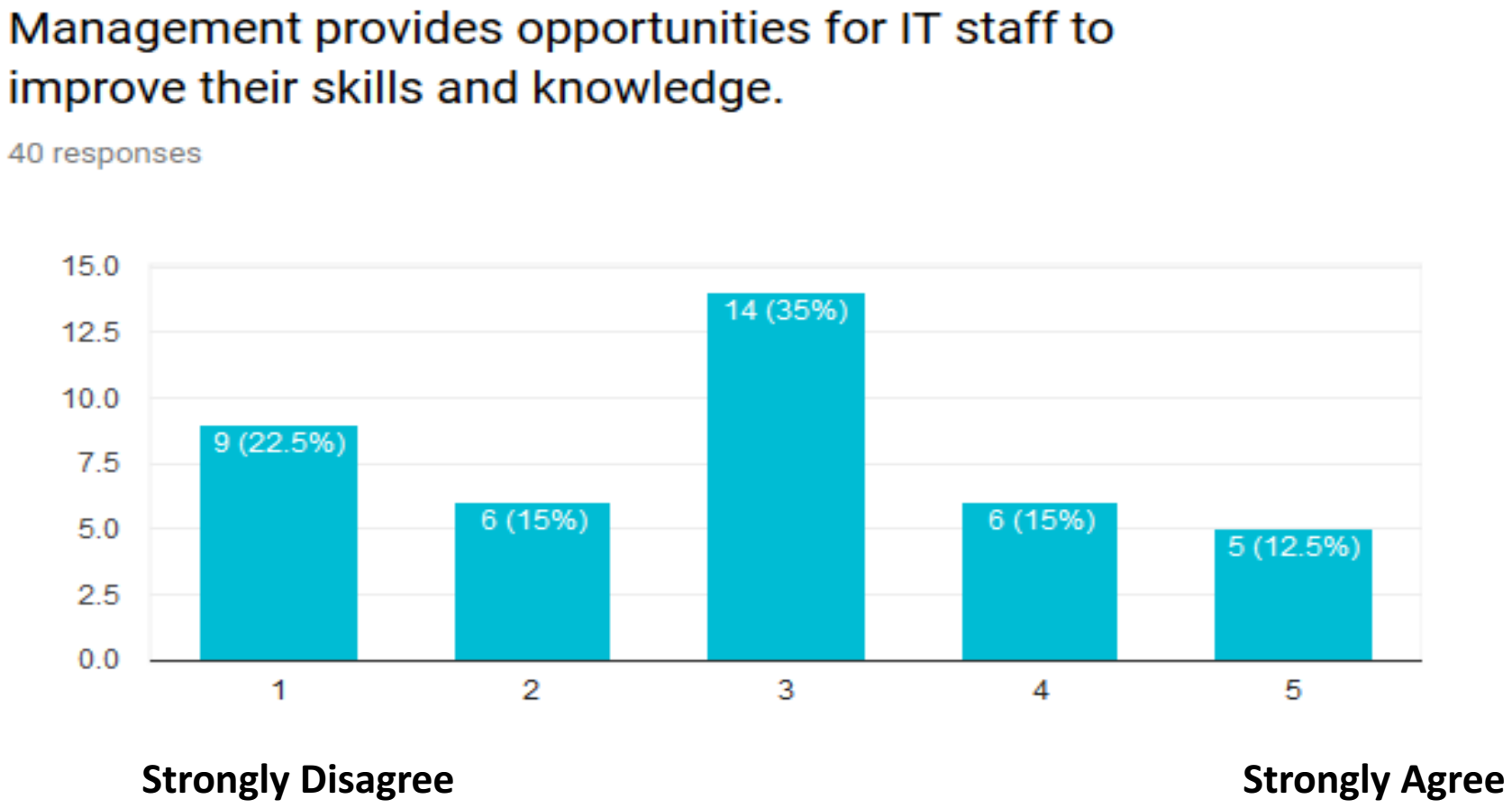
Organisational IT readiness



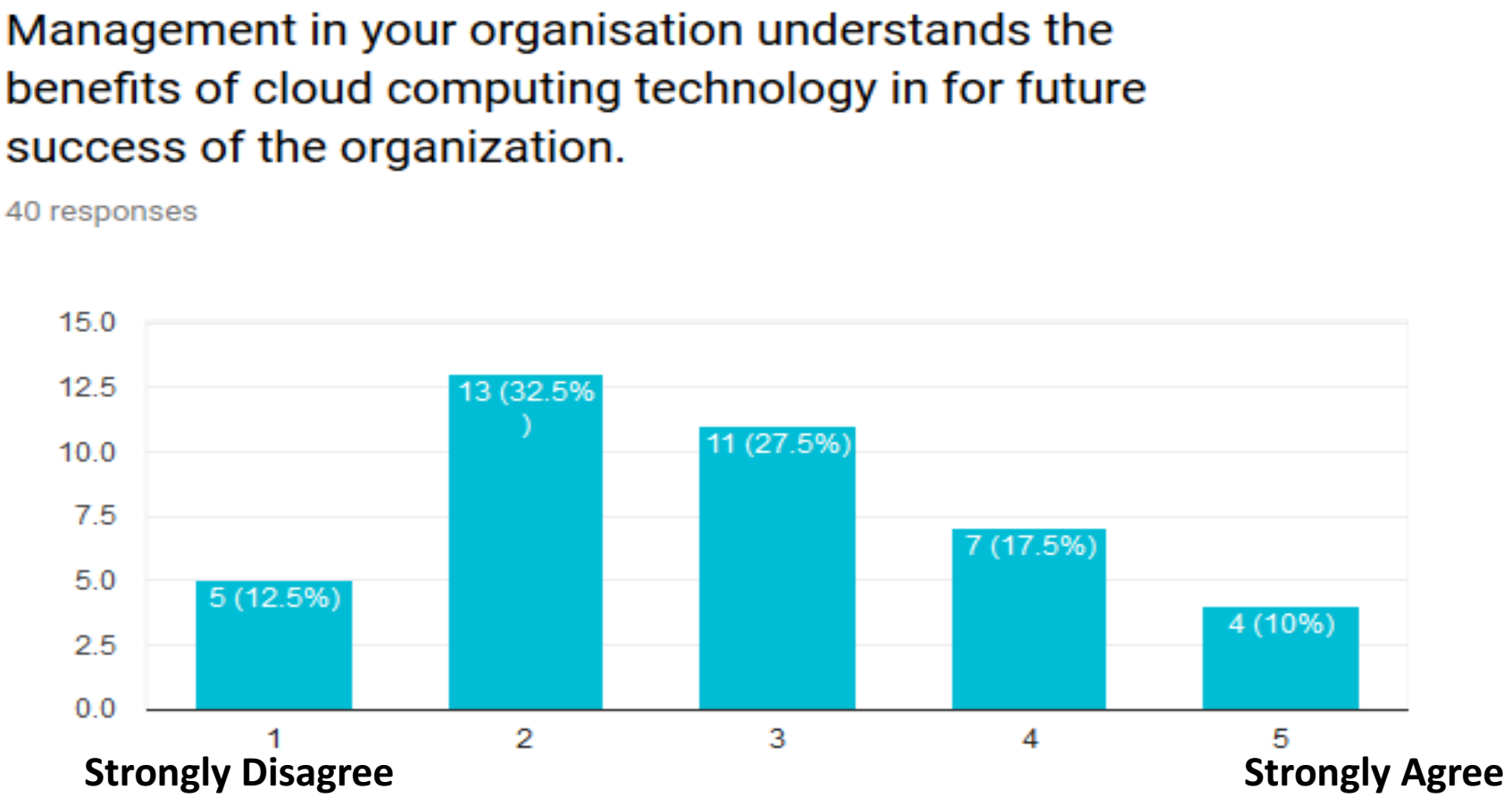
Organisational Readiness



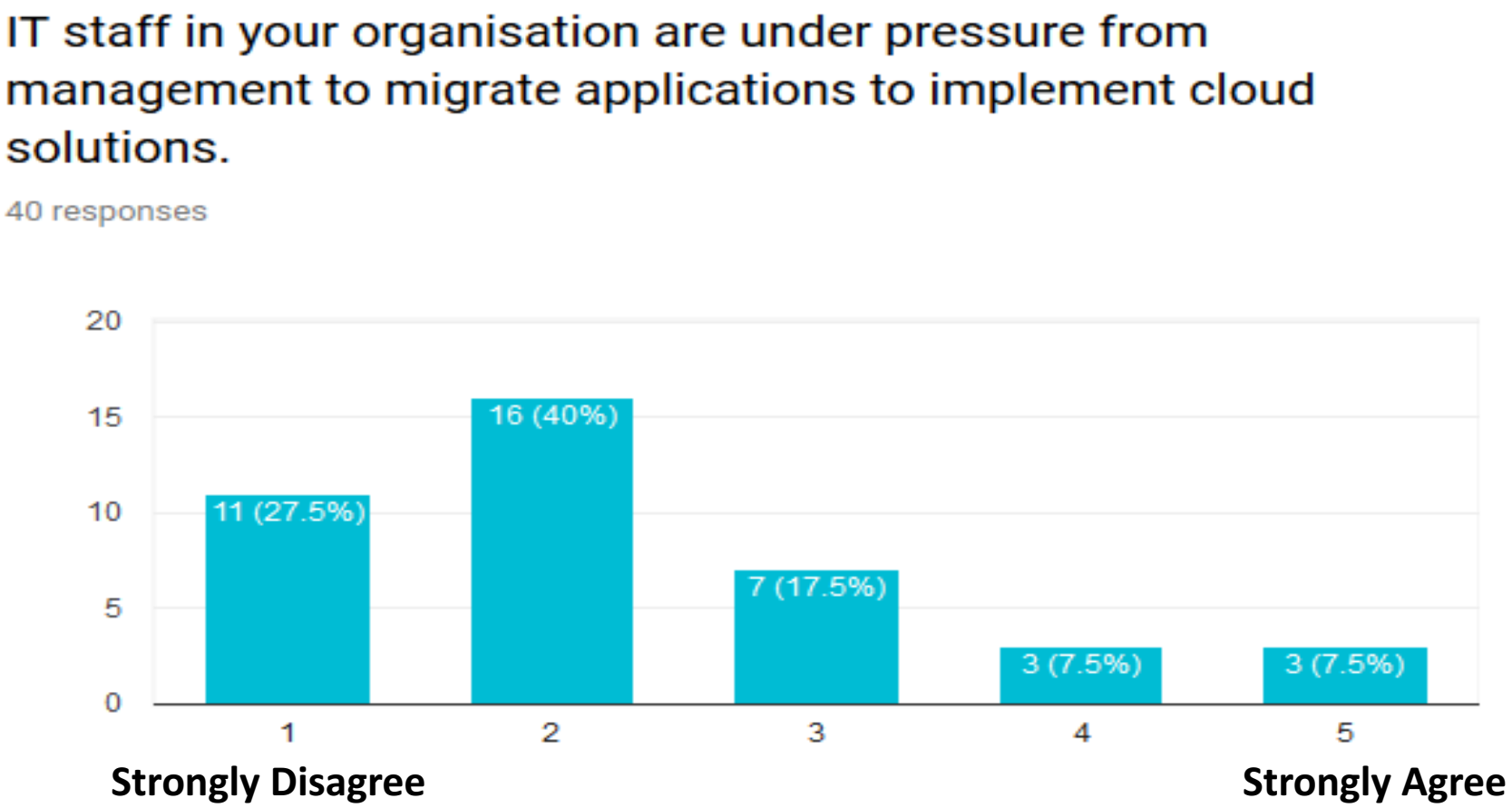
Capacity development



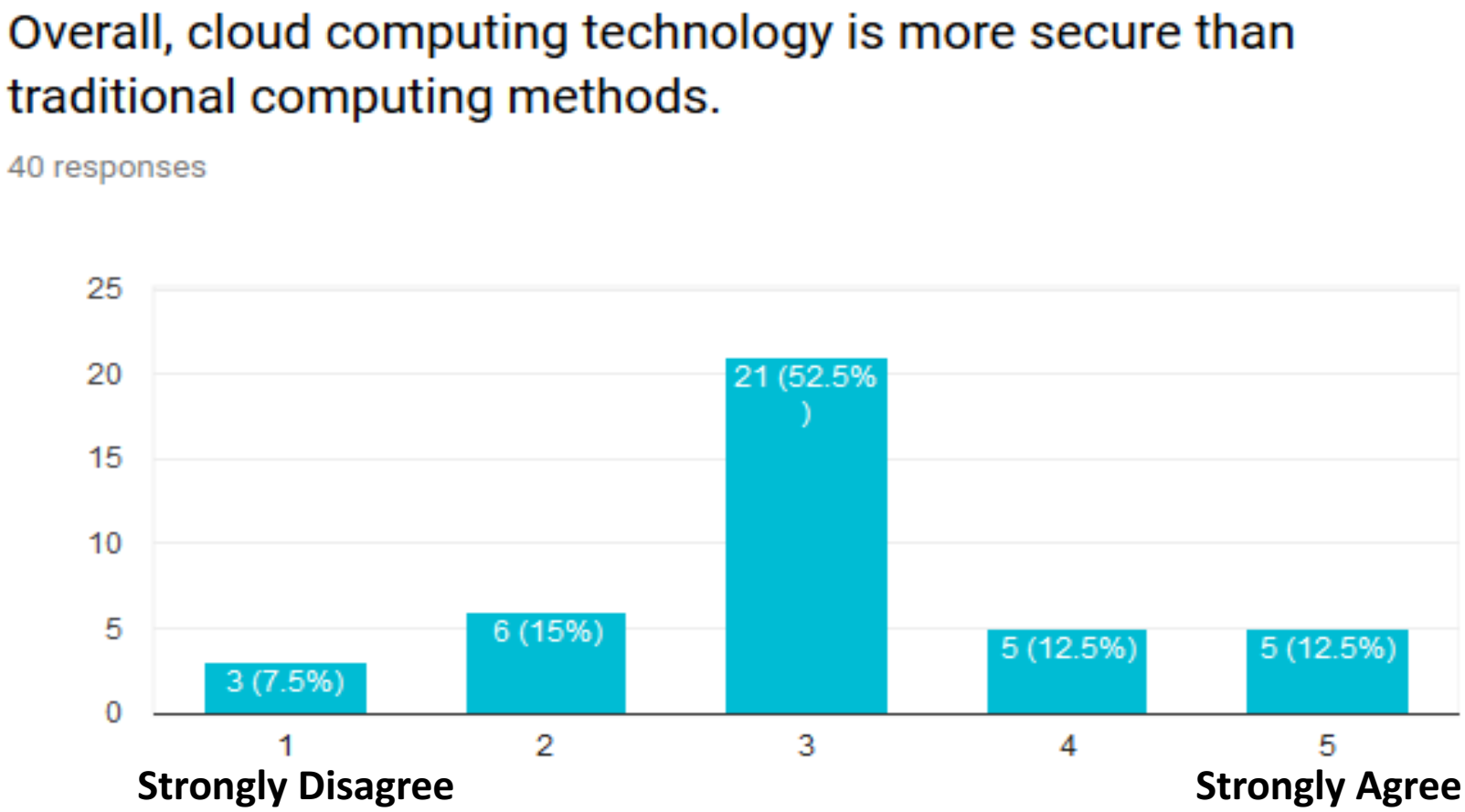
Top Management Support



Pressure to Implement



Security


Overall, cloud computing technology is more secure than traditional computing methods.
40 responses
25
20
15
10
5
0
3 (7.5%)
6 (15%)
21 (52.5%)
5 (12.5%)
5 (12.5%)
1
2
3
4
5
Strongly Disagree
Strongly Agree

Immediate Next Steps

- Revisit model with a view towards – KISS (Keep it simple and sweet)
- Address data gaps –
  - Face-to—face Interviews with IT Managers in Ministries (triangulation)
  - Data collection (Survey Questionnaire)
- Data Validation
  - Revisit sample population with a view to determine useful respondents
- Inferential Data Analysis
  - Structural equation modelling (SEM-PLS) allows testing and estimating complex cause-effect (causal) relationships among multiple independent and dependent constructs simultaneously