



## USING GEO-SPATIAL TECHNOLOGY TO MANAGE INNER-CITY BUILDING CONSTRUCTION WITHIN CONFINED SPACE AND CONGESTED ACCESS, CAPE TOWN, SOUTH AFRICA

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## STATEMENT OF RESEARCH PROBLEM

### CONSTRUCTION FIRMS ARE NOT INNOVATIVE OR DYNAMIC WHEN IT COMES TO IMPROVING BUILDING PRODUCTION PROCESSES

**Building Production Processes** – the organisation and management of the plans, equipment, materials and labour involved in the construction of a building while complying with contractual stipulation.

This research investigates the complex nature of building construction in urban centres.

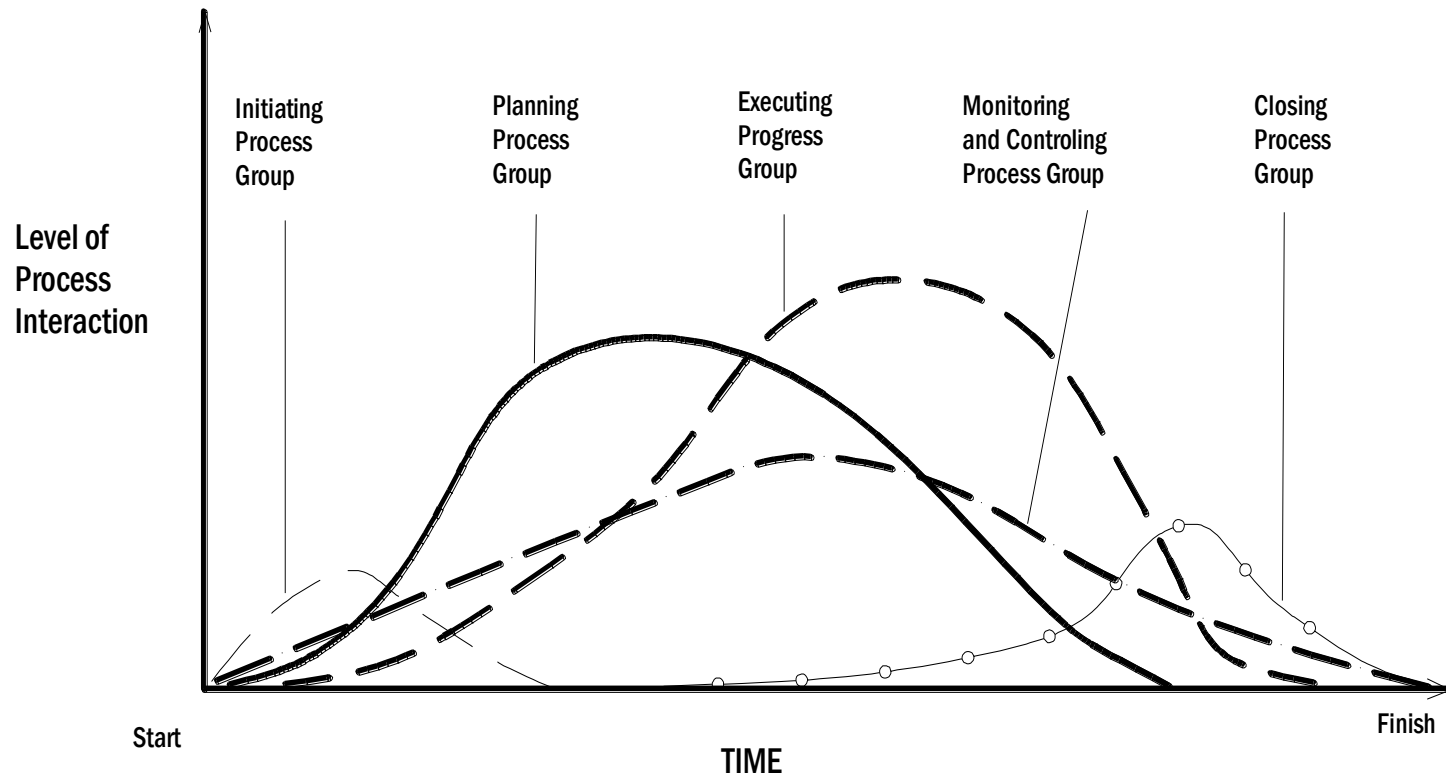
The increasing number of inner city developments suggests that congested site construction is rapidly becoming the norm within the industry.

The complex nature of construction in urban centres includes confined space, congestion and restricted access to a construction site. This creates challenges such as personnel in close proximity, increase personnel management, project planning issues, coordination of management and increased resource management.

# TO WHAT DEGREE DO THE FOLLOWING INNOVATIVE TECHNOLOGIES ENHANCE BUILDING PRODUCTION PROCESSES DURING THE FIVE STAGES OF CONSTRUCTION MANAGEMENT?

- ▶ Computer software that facilitates communication of data, knowledge and design solutions between project participants i.e. **Building Information Modelling**
- ▶ Indoor location sensing systems i.e. **location awareness technology**
- ▶ Computer software that facilitates three dimensional **(3D) Laser Scanning** i.e. Point Cloud Scanners
- ▶ Rapid information accessibility i.e. **Bar Code Scanners** to build computer databases
- ▶ **Remote Imagery** for site and layout planning i.e. unmanned aerial vehicles UAV/drone
- ▶ **Closed-Circuit Television (CCTV)** cameras i.e. video surveillance

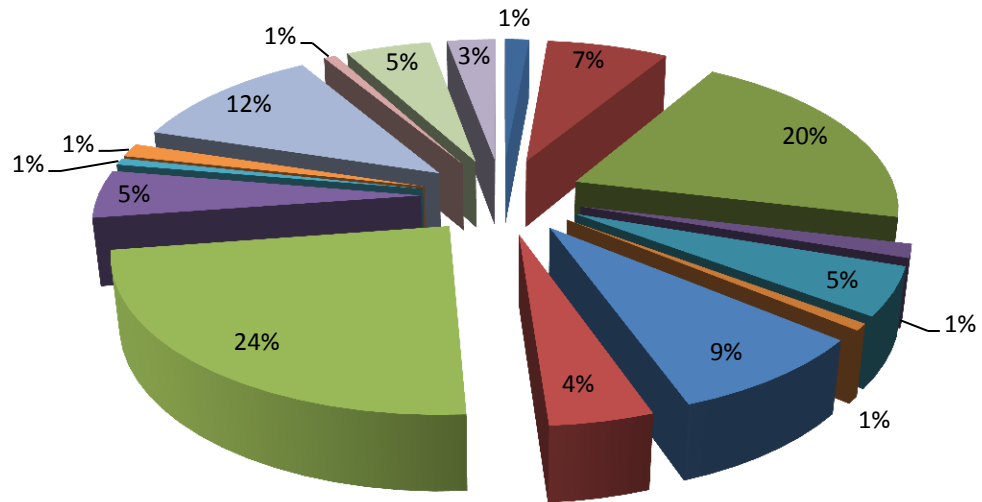
# PROCESS GROUPS IN PROJECT MANAGEMENT



(PMBOK, Fourth Edition, 2008)

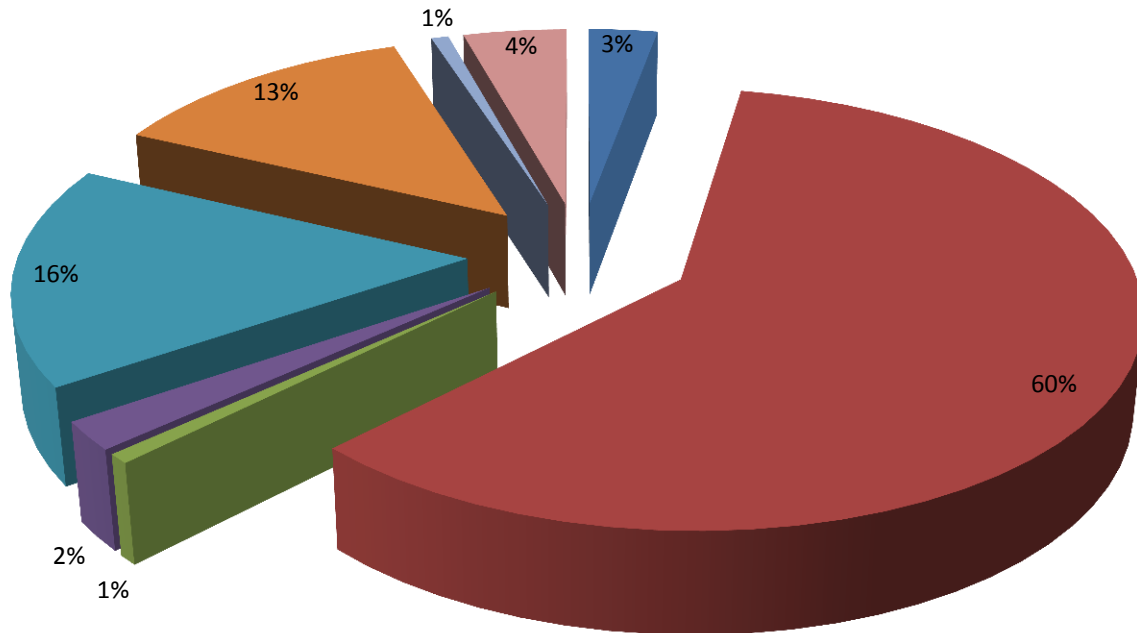
# SAMPLE OF RESPONDENTS

- Architect
- Facilities Manager
- Project Manager
- Site Agent
- Student Quantity Surveyor
- Technician
- Contracts Manager
- Forman
- Practitioner
- Student Contracts Manager
- Site Supervisor
- Engineer
- Laboratory Technician
- Quantity Surveyor
- Student Engineer
- Surveyor

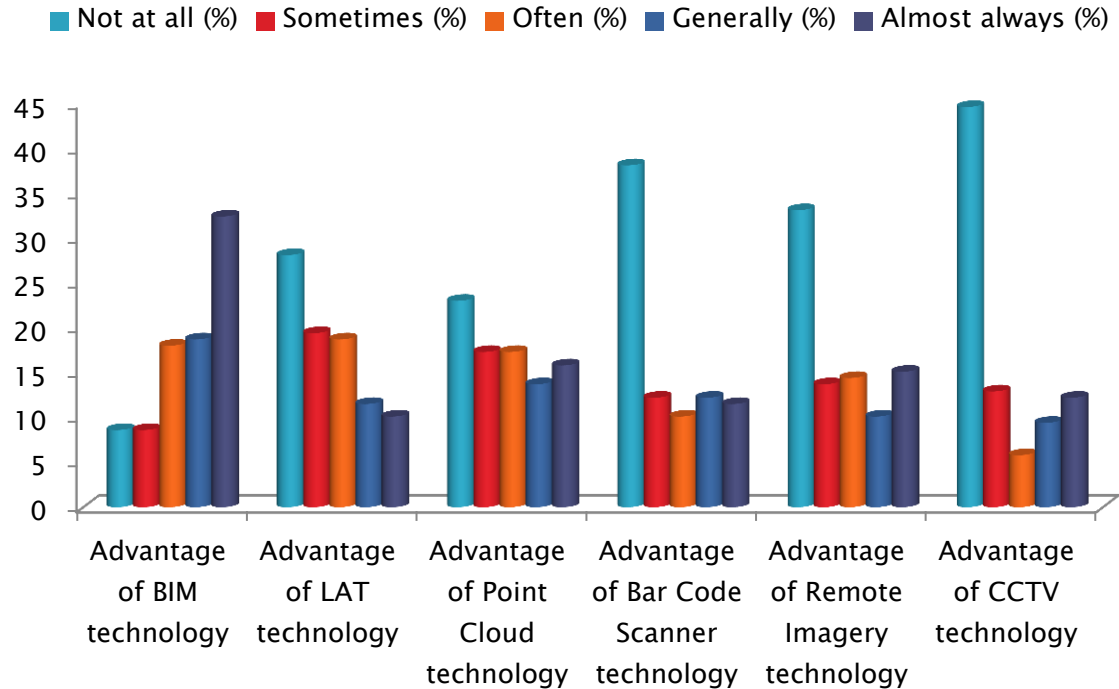


# TYPES OF FIRMS RESPONDENTS BELONG TO

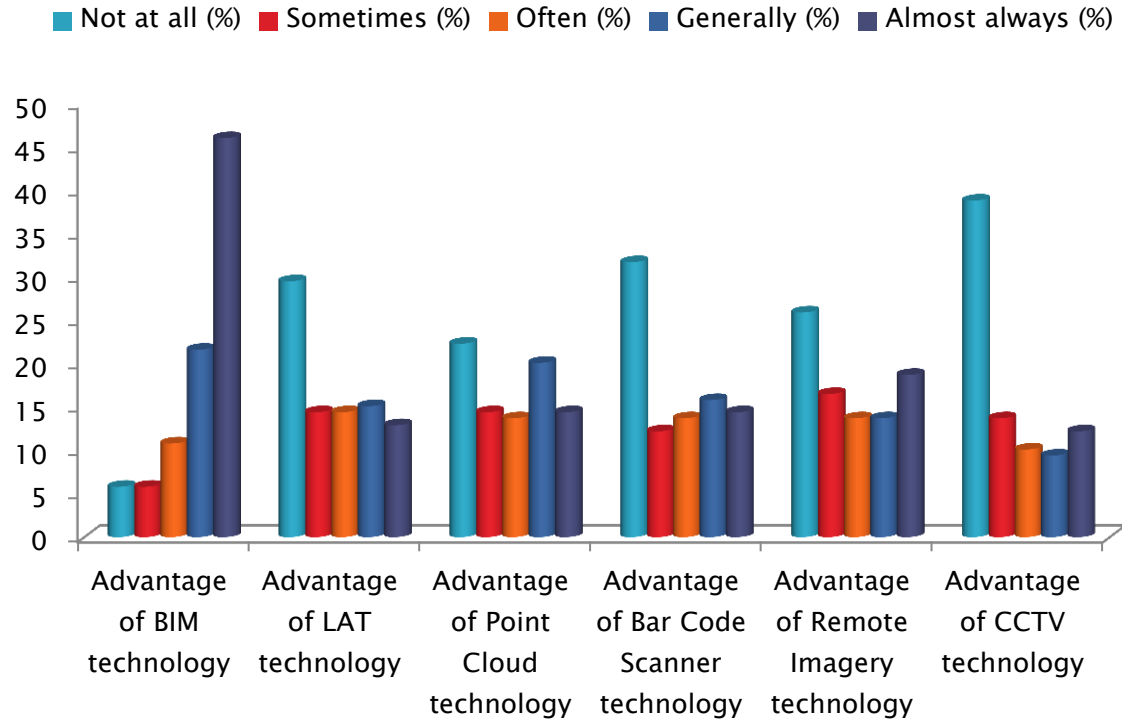
- Architectural
- Contractor
- Facilities Management
- Government
- Project Management
- Quantity Surveying Consultant
- Real Estate Agency
- Sub Contractor



# THE USEFULNESS OF INNOVATIVE TECHNOLOGY IN THE INITIATING STAGE OF A BUILDING PROJECT

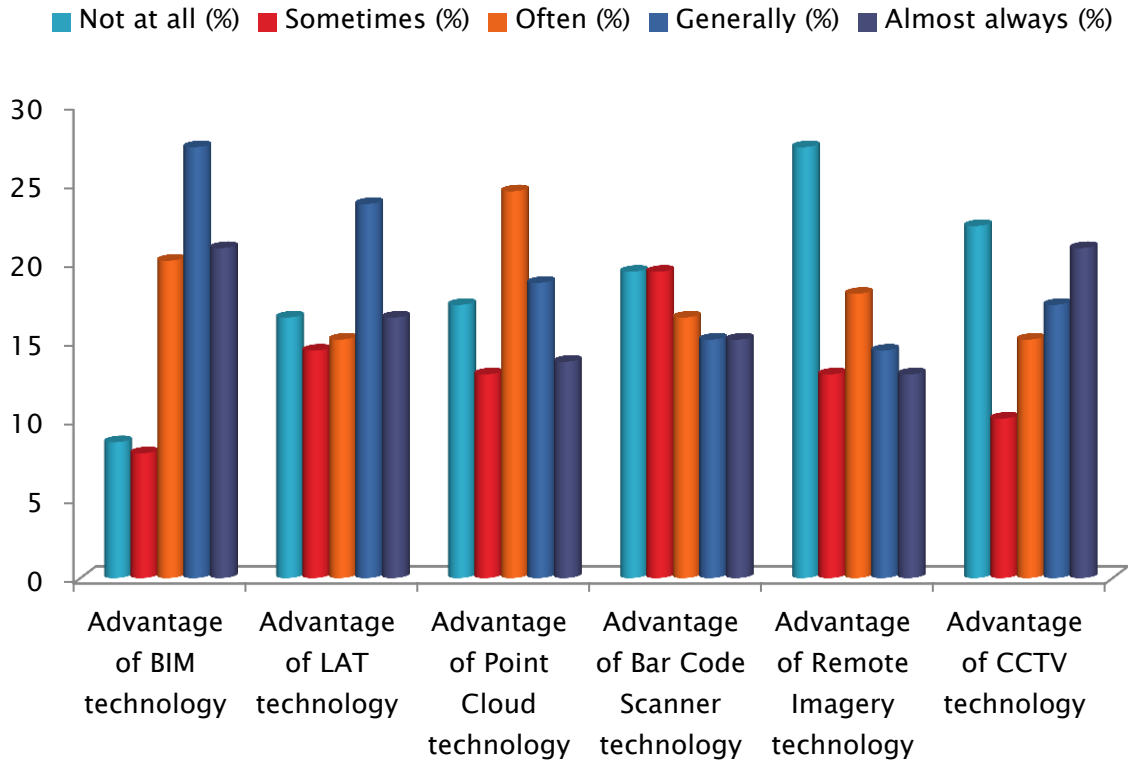


# THE USEFULNESS OF INNOVATIVE TECHNOLOGY IN THE **PLANNING** STAGE OF A BUILDING PROJECT

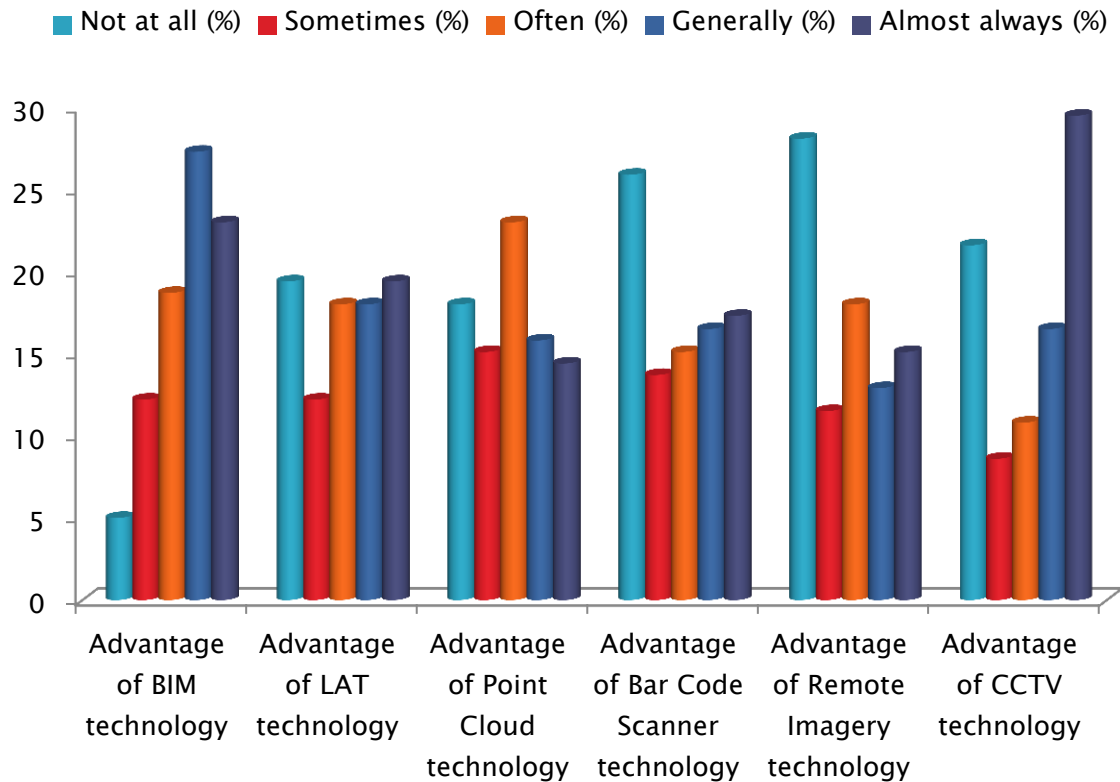




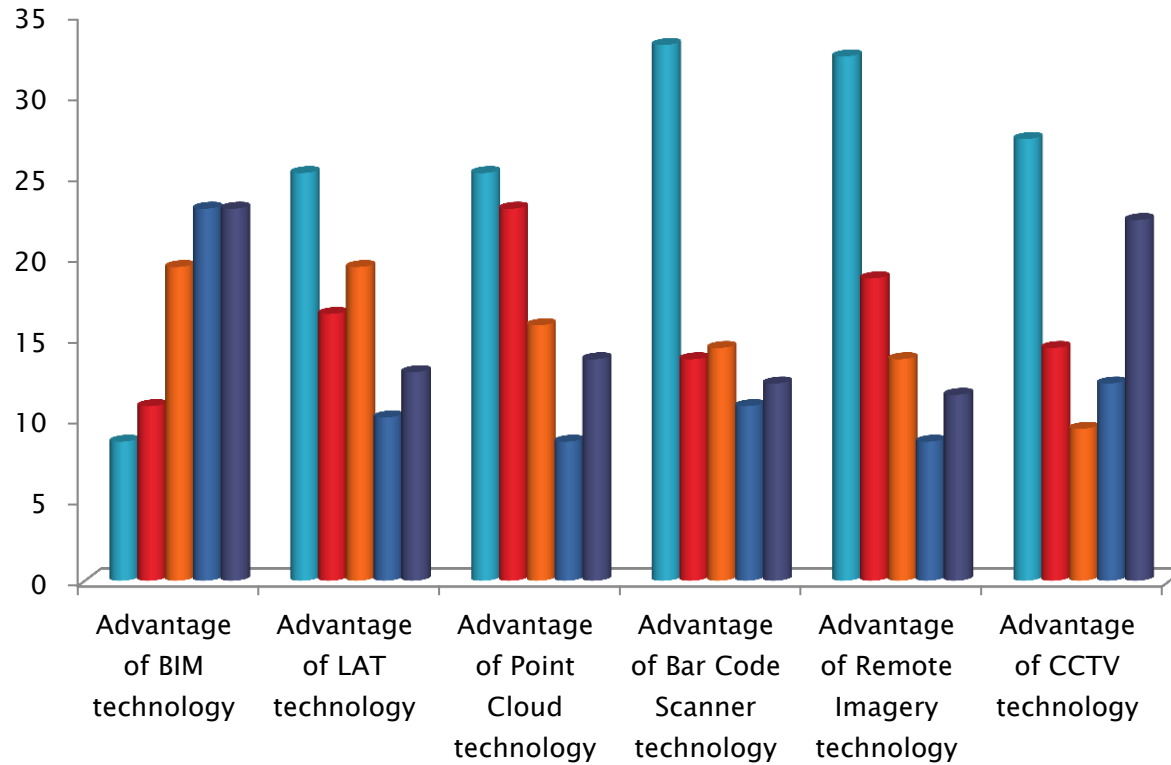
# THE USEFULNESS OF INNOVATIVE TECHNOLOGY IN THE EXECUTING STAGE OF A BUILDING PROJECT



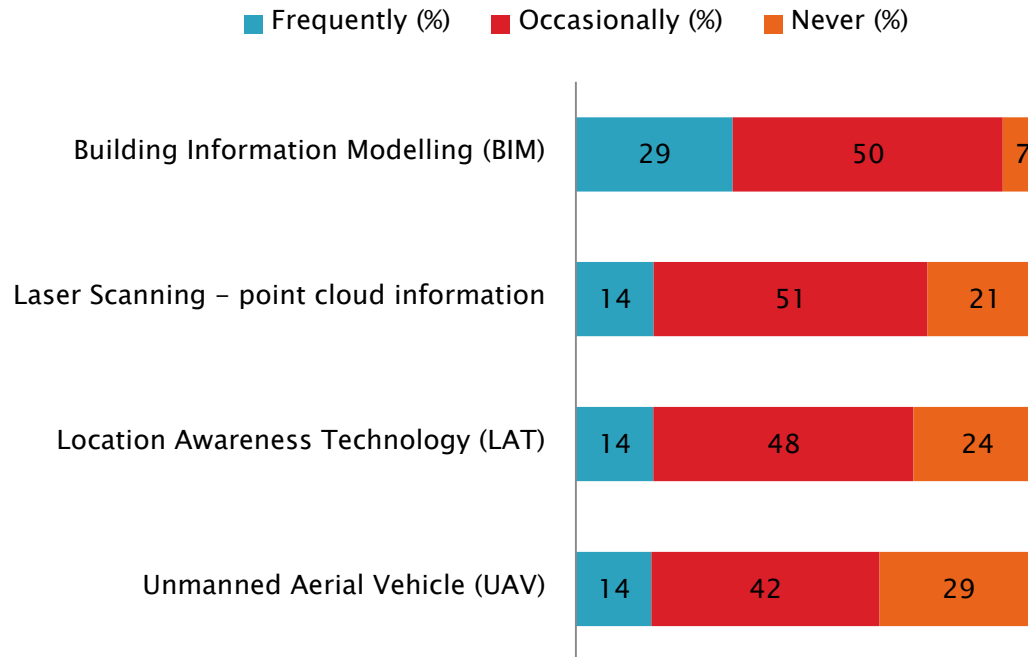
# THE USEFULNESS OF INNOVATIVE TECHNOLOGY IN THE MONITORING STAGE OF A BUILDING PROJECT



# THE USEFULNESS OF INNOVATIVE TECHNOLOGY IN THE **CLOSING** STAGE OF A BUILDING PROJECT



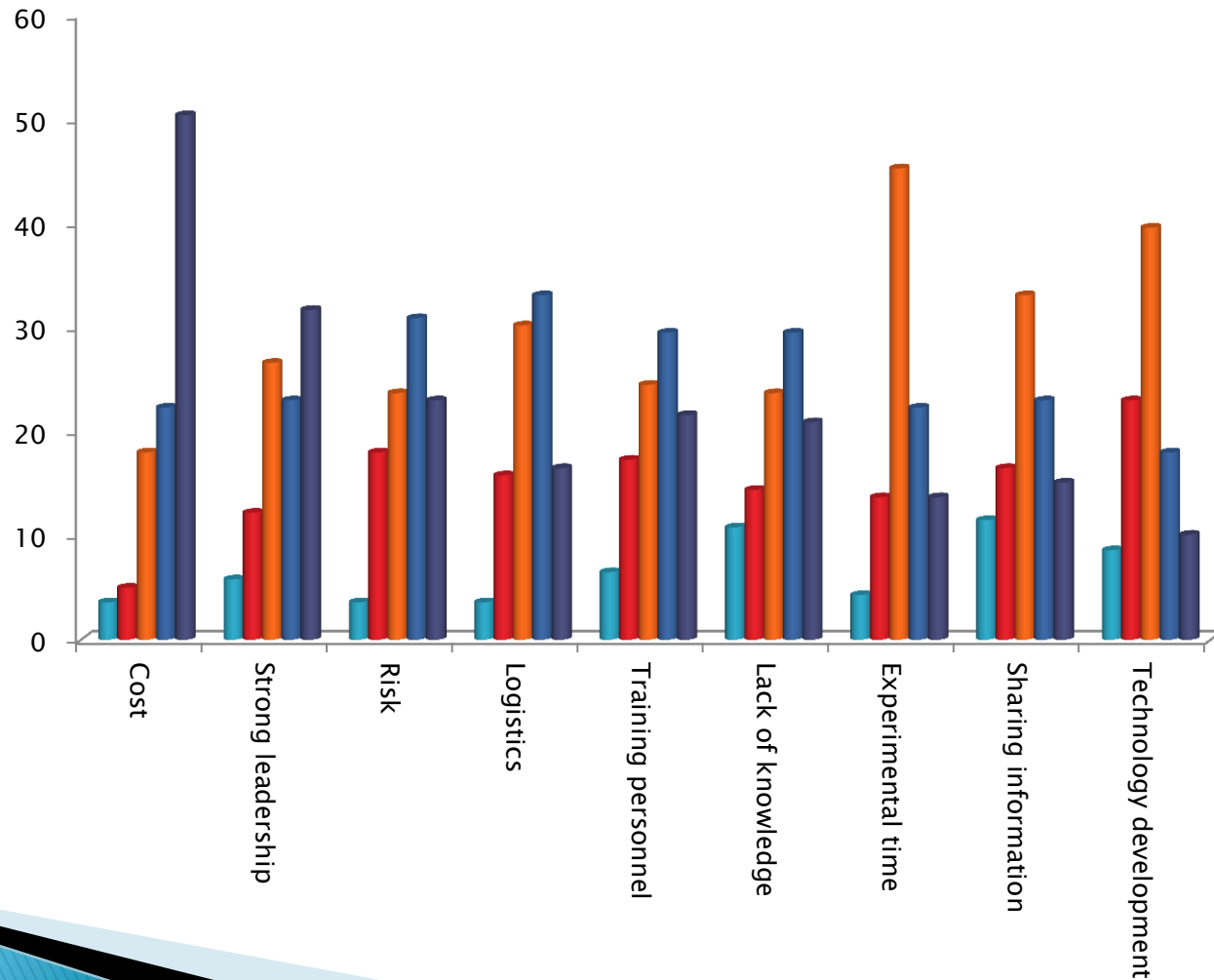
# TRENDS IN GEOSPATIAL TECHNOLOGY IN BUILDING CONSTRUCTION (THIS SURVEY)



Innovative Technology	Process groups in building production management				
	Initiating	Planning	Executing	Monitoring	Closing
BIM technology	✓	✓	✓	✓	✓
LAT technology	x	x	✓	✓	x
Point Cloud technology	x	x	✓	✓	x
Bar Code Scanner technology	x	x	✓	x	x
Remote Imagery technology	x	x	x	x	x
CCTV technology	x	x	x	✓	x

# ISSUES THAT INFLUENCE A CONSTRUCTION FIRM'S DECISION TO INVEST IN NEW STRATEGIC MANAGEMENT METHODS ON CONSTRUCTION SITES?

■ Not at all (%) ■ Sometimes (%) ■ Often (%) ■ Generally (%) ■ Almost always (%)



# CONCLUSION

Statement	Average (%)	
	Disagree	Agree
Current building production processes in South African are internationally aligned	47%	53%
Current building production process in South Africa need to be modernised	24%	76%
There are policies in place to mitigate weaknesses in the current building production processes in South Africa	43%	57%
The construction industry in South Africa is reluctant to use innovative strategic management methods in urban centres	36%	64%