

Research Project

In what ways has technology evolved over the last century to impact the function of a construction surveyor?

Introduction:

Over the past century, construction surveying has evolved from manual tools to advanced digital technologies such as LiDAR, BIM, and GPS. These innovations have improved accuracy, efficiency, and data management, significantly changing the role of surveyors.

FINN GALE

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Methodology:

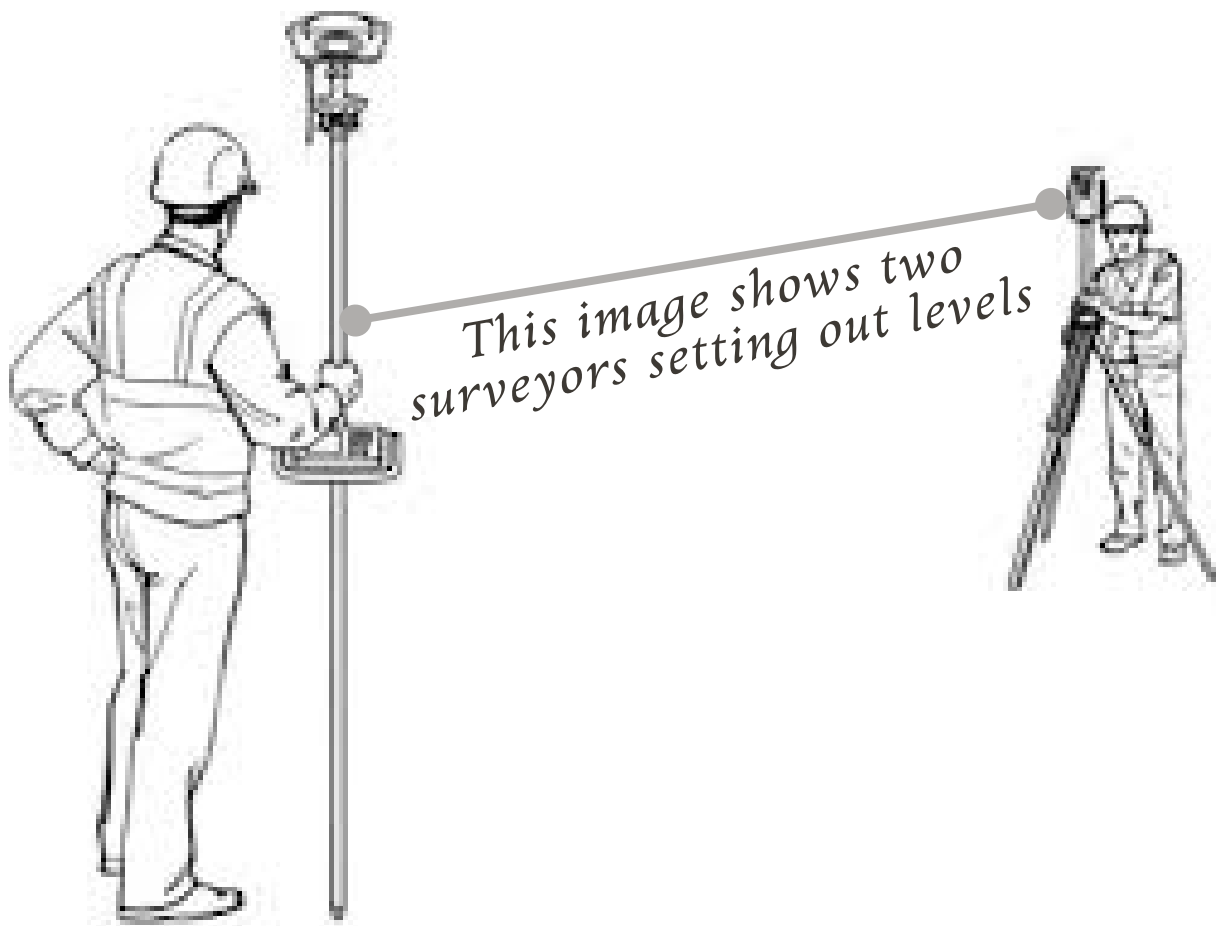
- Literature Review** – Examining past and current research on surveying technology.
 - Quantitative Research** – Surveys to assess industry adoption and effectiveness.
 - Qualitative Research** – Interviews with experienced surveyors for in-depth insights.
 - Data Analysis** – Using SPSS to identify trends and patterns in collected data.
- Comparative Analysis:**
- Practical Implications:**
- Surveyors must adapt to digital tools for career growth.
 - Educational institutions should update scopes to include modern surveying methods.
 - Companies must invest in continuous training for seamless technology adoption.

Conclusion & Recommendations:

To future-proof the profession, industry leaders should promote standardized training, regulatory updates, and investment in emerging technologies. Collaboration between Education and professionals ensuring surveyors remain competitive and equipped for ever evolving industry demands.

Criteria	Traditional Surveying	Modern Surveying
Time Required	4 Weeks to manually collect the data including mapping out.	1 Week of automated data processing using modern tools.
Accuracy	Plus, or minus 10mm to 30mm error due to manual calculations.	Plus, or minus minimal error with GPS & LiDAR precision, can depend on user, 10 - 20mm error possibility.
Labor Costs	6 Full time surveyors consistently out on field work. (Both are based on £300 per day per person)	3 Full time surveyors, minimising field work by almost 75 percent. (Both are based on £300 per day per person)
Data Processing	Manual CAD drafting required, taking 2 weeks	Building Information Modelling (BIM), LiDAR, GPS etc depending on project can take 2-3 days.
Safety Risks	High (manual access to hazardous terrain, heavy equipment slowing down the surveying)	Low (drones can access dangerous areas, reducing human risk)
Final Cost	£100,000 (high full-time labour for longer and the additional equipment rent cost)	£60,000 (reduced labour, higher initial up-front investment, however long-term savings make a dramatic impact if this case study was built over a decade or more)

Commonly known as an optical ‘Dumpy Level’



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Key Technologies Covered:

- LiDAR** – High-precision laser scanning for topographic mapping.
- BIM** – 3D modeling to enhance collaboration and visualization.
- GPS** – Real-time spatial positioning, reducing reliance on physical reference points.
- Drones & AI** – Automated data collection and analysis for improved efficiency.

Research Aims & Objectives:

- Investigate the impact of new technology on surveyors’ roles and responsibilities.
- Compare traditional vs. modern surveying techniques in terms of accuracy, efficiency, and cost.
- Assess the challenges and opportunities presented by digital tools.
- Gather perspectives from industry professionals through surveys and interviews.

Category	Traditional Surveying	Modern Surveying
Initial Equipment Cost	£5,000 - £15,000	£40,000 - £150,000
Software upfront costs	£500 - £2,000 (once or easily rentable)	£4,000 - £12,000 per year (More difficult to rent as much more expensive)
Training Costs	£500 - £1,000 – for one tool, however said tool is not going to change again.	£2,000 - £8,000 per surveyor of which is consistently changing and requiring new training.
Maintenance & Running Costs	£500 per year depending on renewals. Built much sturdier.	£10,000 per year as the technology is constantly being upgraded
Survey Time	Slower (days to weeks)	Much faster (Hours or days)
Labour Costs	Higher (manual data collection)	Lower (automated & digital workflows)
Rework Costs	High (manual errors)	Low (precise digital data)
Total Project Cost	Higher due to inefficiencies	Much quicker project scope timescale

In Conclusion;

Factor	Traditional Surveying	Modern Surveying (LiDAR, BIM, GPS)
Accuracy	Lower, human error risk	High precision, real-time data
Efficiency	Time-consuming, manual work	Fast, automated, minimal labor
Cost	Lower initial cost	Higher initial investment but long-term savings
Skills Required	Basic technical knowledge	Advanced digital skills & software proficiency



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