

▶ GeoSpatial Solutions:
Empowering Government
and Enterprises

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AGENDA



- 1 ■ **The Future of Geospatial Technology**
- 2 ■ **GIS Solutions to Today's Problems**
- 3 ■ **Typical Workflow for GIS Solution**
- 4 ■ **Application Highlights**
- 5 ■ **Future of 3D Laser Scanning Technology**
- 6 ■ **Conclusion**

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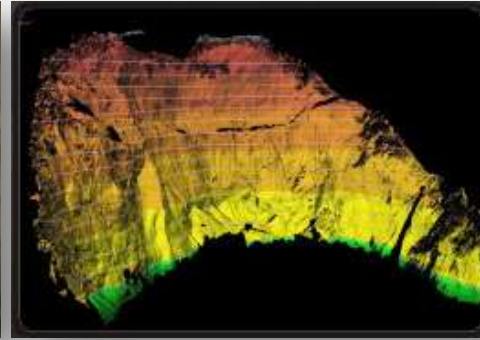
Geospatial Solutions to Government and Enterprises



Natural Resource
Monitoring



Infrastructure
Management



Archaeological
Excavation



Urban Planning

Before:

Geospatial technology has traditionally been utilized by Government and Enterprise primarily for mapping, facilities management, asset management and design and construction

Challenges in adopting GIS solutions:

- Limited use of Geographical Information System solutions for other applications due to complexity and difficulty of obtaining data.
- Limited integrated software solutions from field to finish.

1

Geospatial Solutions to Government and Enterprises

Current challenges faced by Government and Enterprises:

- Lack real time information
- Delayed timelines due to inadequate planning and inaccurate information
- Underestimated budgets due to inaccurate data and opinion rather than fact
- Lack of control over project progress
- Dependent on opinions rather than fact for decision makings

1

Geospatial Solutions to Government and Enterprises

Today and going forward:

- The Geospatial technology is disrupting traditional markets as mapping applications are integrated with monitoring and control systems, further improving efficiency with more accurate GIS data
- Advancements in technology and lower prices are driving adoption of GIS technology for more applications
- Various new applications not possible with traditional tools are being solved
 - Road mapping
 - Facilities management
 - Factory production line planning

2

GIS Solutions to Today's Problems

Some of the application highlights:

- **Historical Site Preservation:** Using GIS solutions to identify and locate the damaged sites for documentation, repair and restoration.
- **Infrastructure Building:** Using GIS solutions to accurately and quickly capture building progress and empower the owner to make good decisions quickly.
- **Infrastructure Deformation Monitoring:** Using GIS solutions to determine critical deformation and empower the owner to address immediately.
- **Factory Layout Planning:** Using GIS solutions to plan for changes to facility layout quickly and accurately and empower the enterprise to minimize disruption to their production process.

3 Workflow for GIS Data Collection and Processing

1 Data Collection



4 Design Output for Planning and Construction.



5 Output for Geospatial Applications

- Natural resource monitoring
- Infrastructure monitoring
- Archaeological excavation
- Urban planning

2 Data Evaluation and Processing



3 Data Processing in Design Software



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Application Highlights: Historical Site Preservation

Historical sites can to be captured, monitored, and restored as necessary.

Problem:

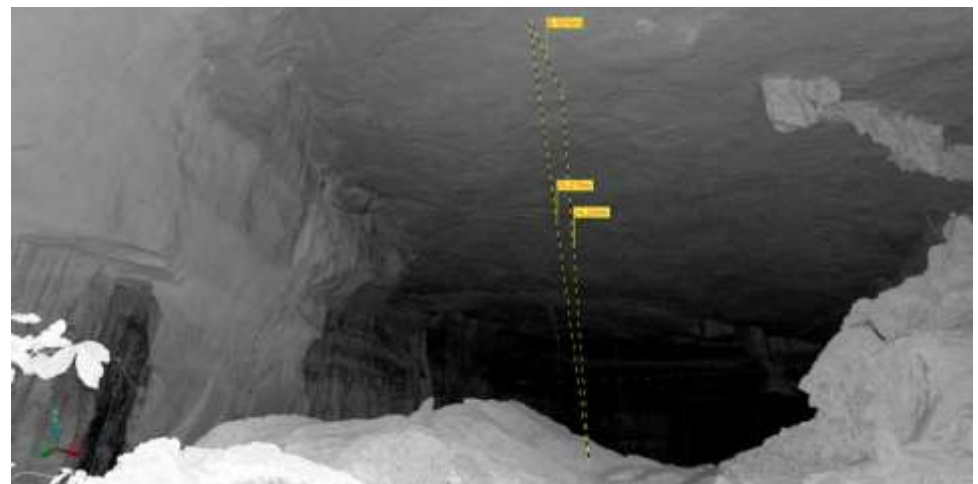
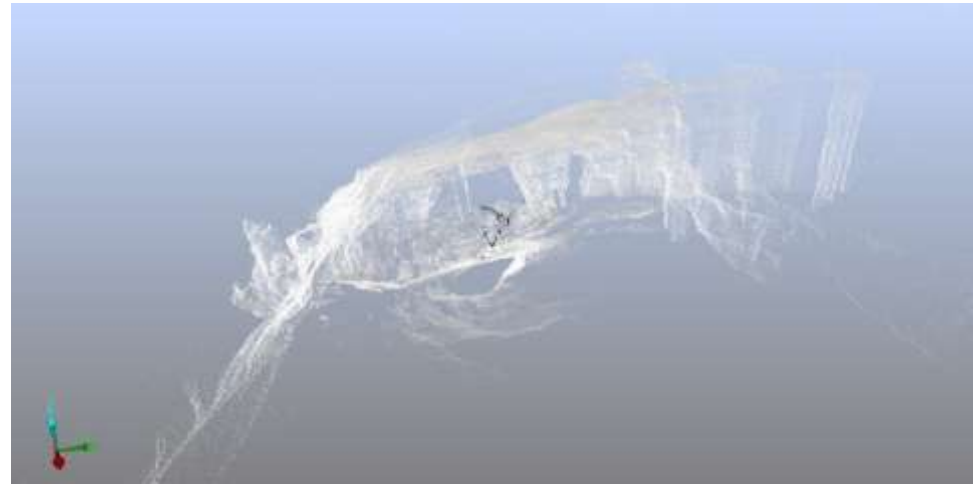
- Visual inspections are inaccurate and open to interpretation by the inspector.
- Significant documentation required with historical methods.

GIS Solution: Use 3D Terrestrial Laser Scanning technology to capture the data quickly and accurately for analysis and digital archiving.

4

Application Highlights: Historical Site Preservation

Geological structure of the caves & historical site documentation



4

Application Highlights: Infrastructure Monitoring

Infrastructure projects can span over large area and distance. Frequent monitoring of the progress is essential to ensure schedule and appropriate payment to contractors.

Problem:

- Progress monitoring of large areas and large projects requires significant resources, is slow, and often plagued with inaccuracies.

GIS Solution: Using 3D Terrestrial Laser Scanning technology to capture the building progress quickly and accurately throughout the project.

4

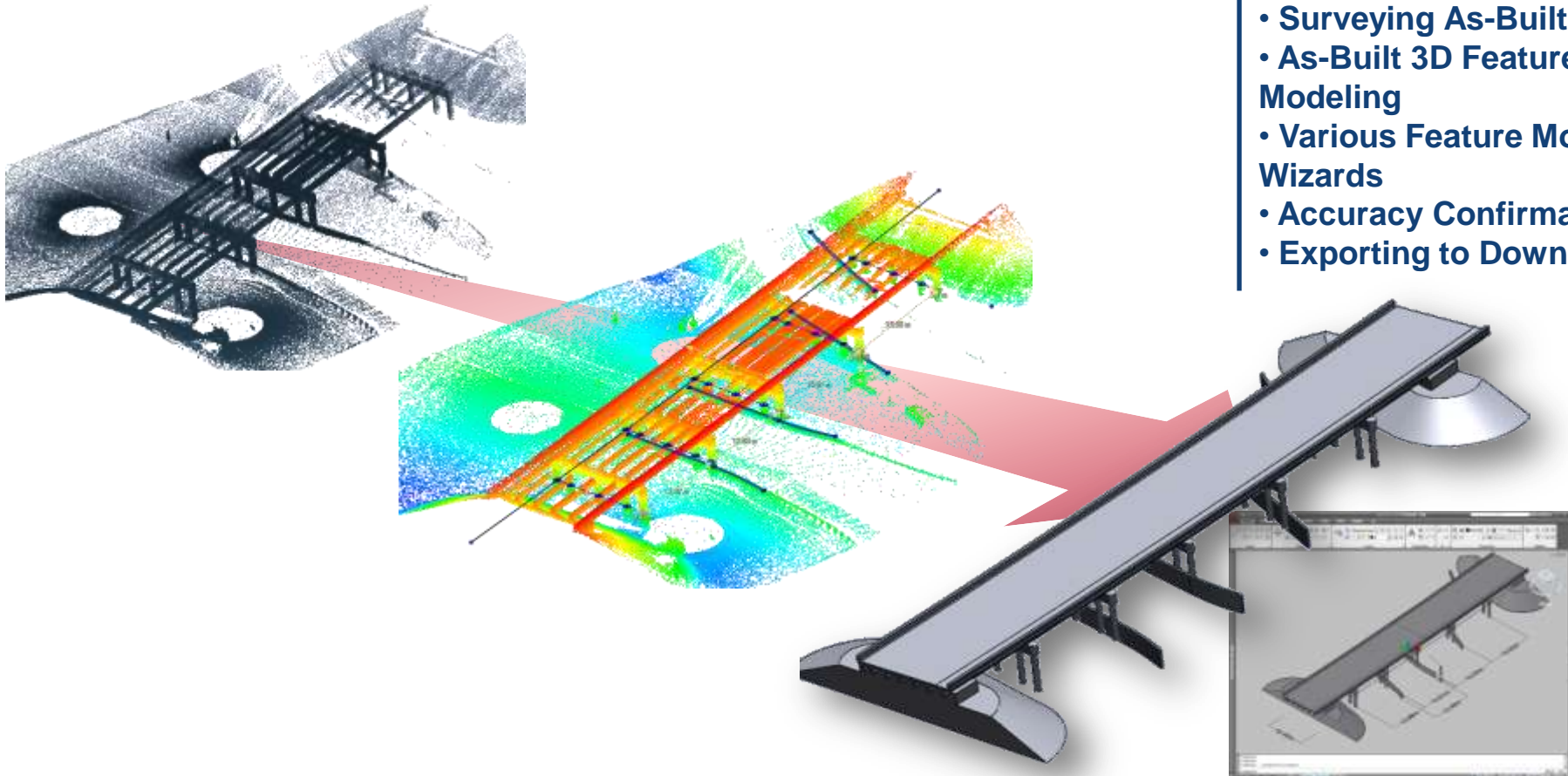
Application Highlights: Infrastructure Monitoring

As- Built Feature Model

Create fully editable 3D CAD models directly from point cloud or mesh data using realtime accuracy analysis tools

Extracting Feature Information and 3D Feature Modeling

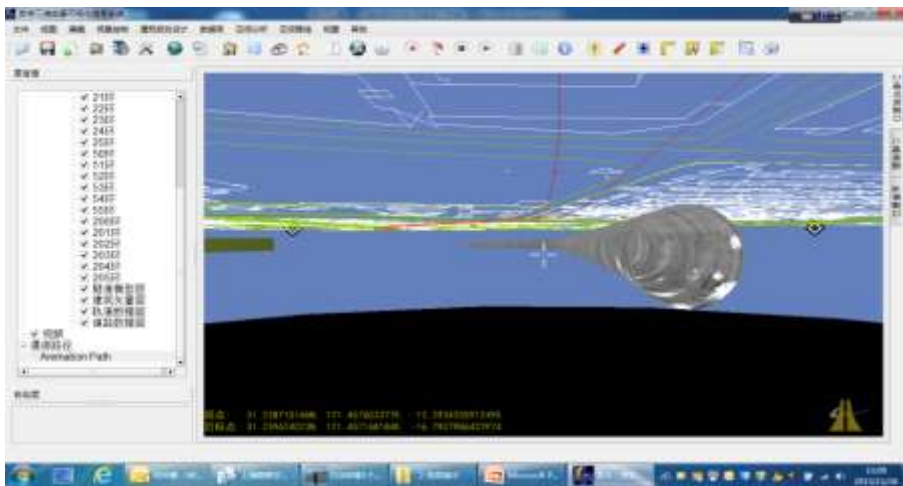
- Surveying As-Built
- As-Built 3D Feature Modeling
- Various Feature Modeling Wizards
- Accuracy Confirmation
- Exporting to Downstream



4

Application Highlights: Infrastructure Monitoring

3D Documentation - Tunnel



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Application Highlights: Structural Deformation Monitoring

Infrastructure undergoes wear and tear over time. Periodic monitoring of the structural condition is critical for preventive maintenance and safety.

Problem:

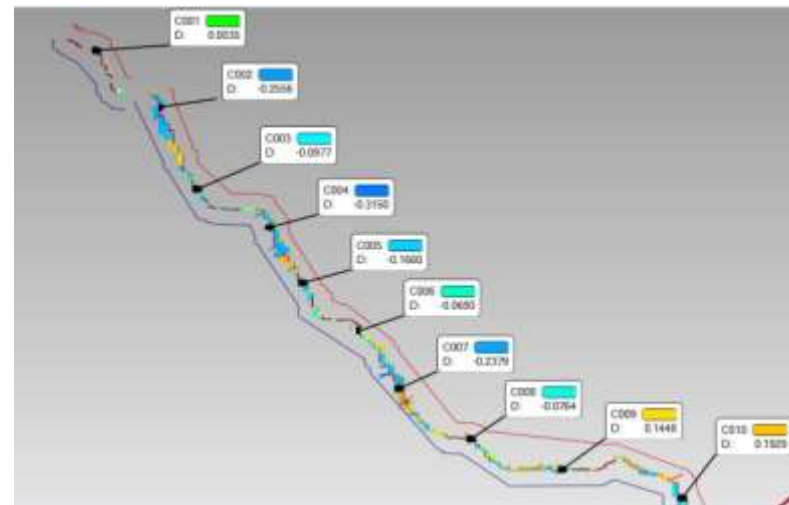
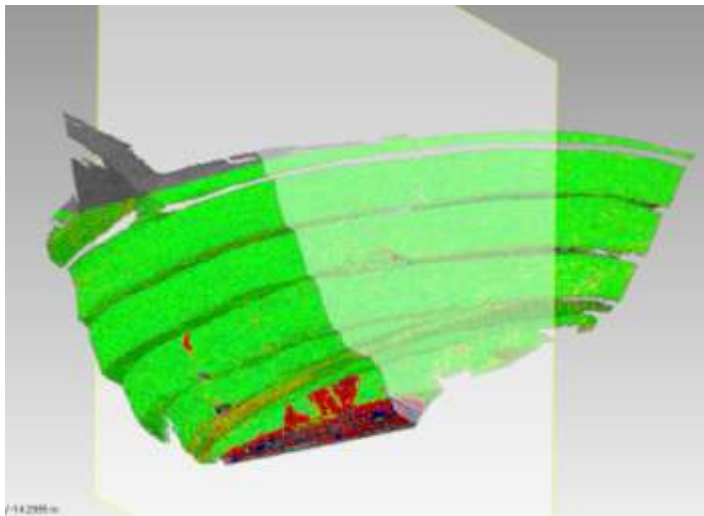
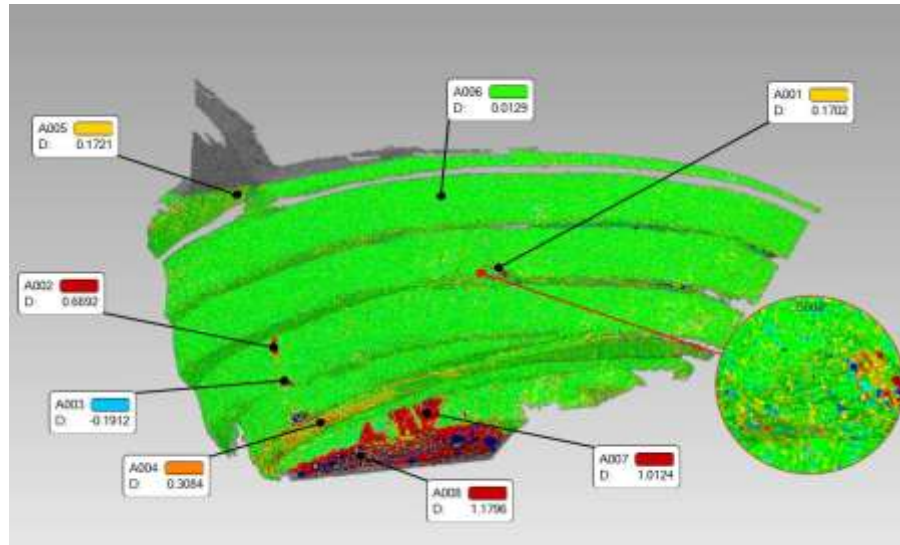
- Structural deformation monitoring is expensive, time consuming, and often open to an individual's interpretation of the structure of acquired data.

GIS Solution: Using 3D Terrestrial Laser Scanning technology and dedicated software to capture the as-built and compare to its original design for deviation analysis quickly and accurately.

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Application Highlights: Structural Deformation Monitoring

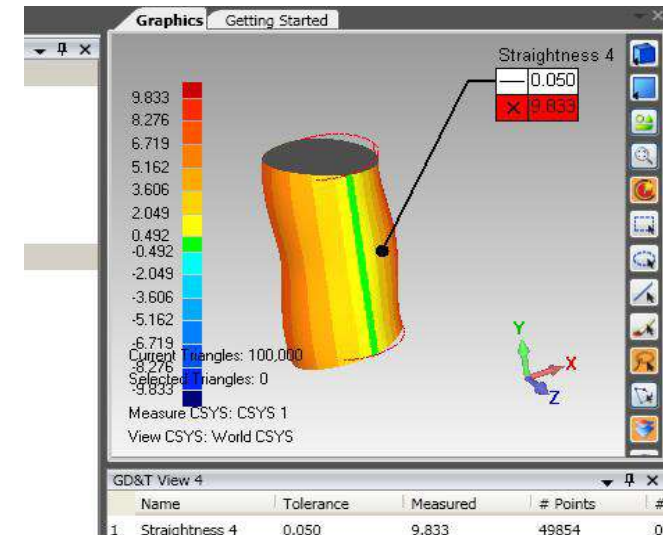
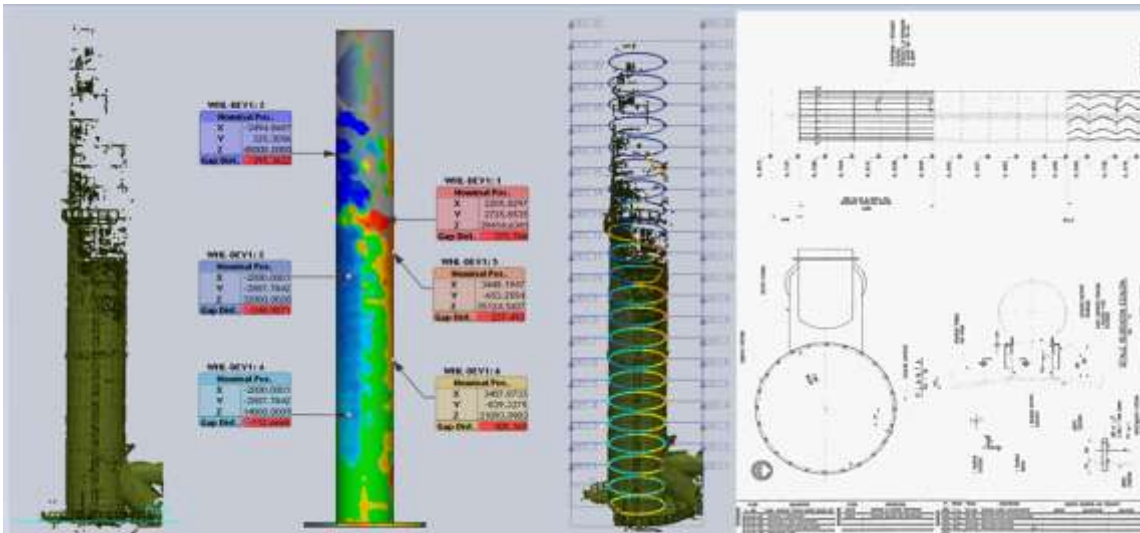
Comparison Analysis : Monitoring



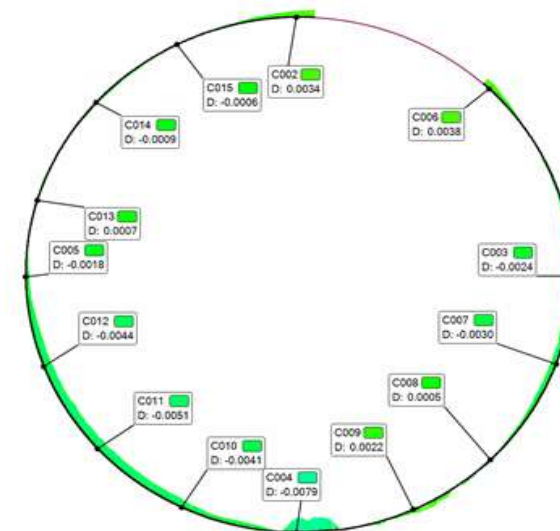
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Application Highlights: Structural Deformation Monitoring

Tank and Chimney Analysis



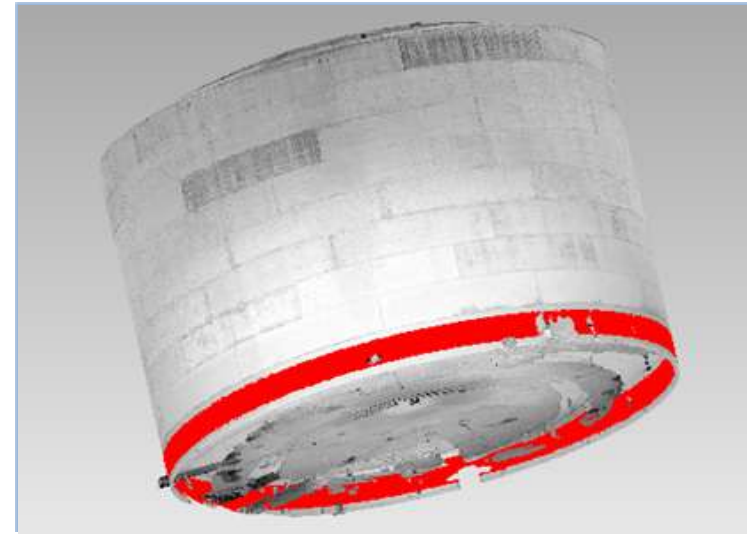
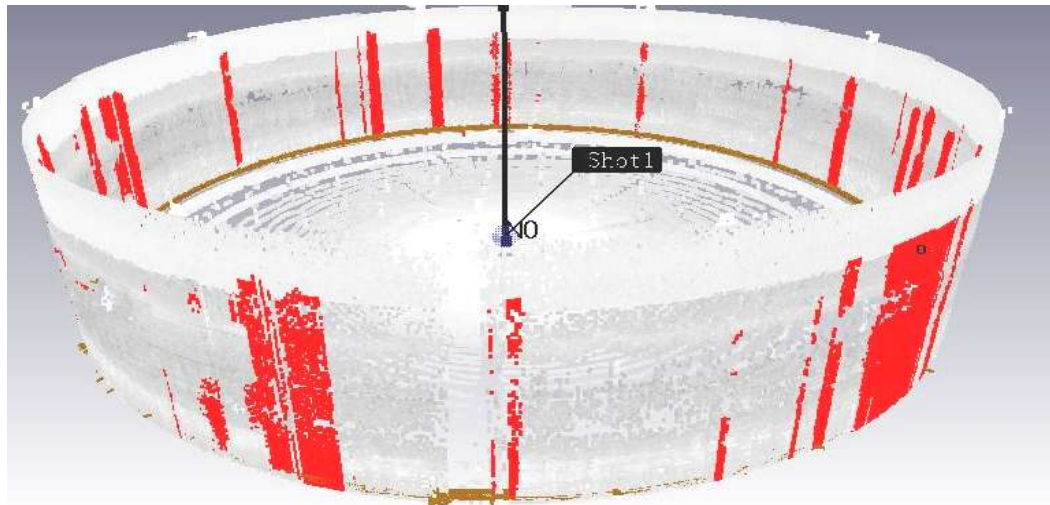
- Deformation Analysis
- Roundness & Straightness Analysis
- Cross Sectional Measurements



4

Application Highlights: Structural Deformation Monitoring

3D Documentation for Inspection



4

Application Highlights: Building Information Modeling

Integrated and intelligent production processes are making manufacturing and construction more efficient at high quality. Production line changes are become more and more frequent. occur regularly on the factory floor. Existing lines have to be modified and new lines have to be fitted into the factory floor.

Problem:

- Digitalize the production floor layout is challenging, laborious, and slow causing difficulty in planning and construction.

GIS Solution: Using 3D Terrestrial Laser Scanning technology and dedicated software to quickly and accurately capture the as-built condition, using the information to plan and alter easily.

4

Application Highlights: Building Information Modeling

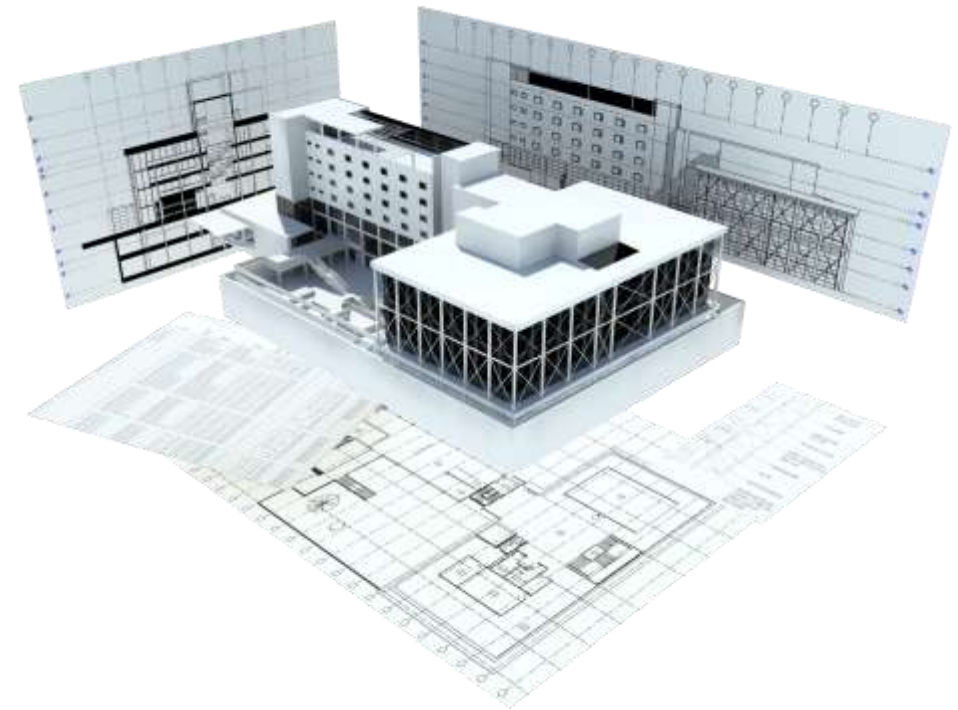
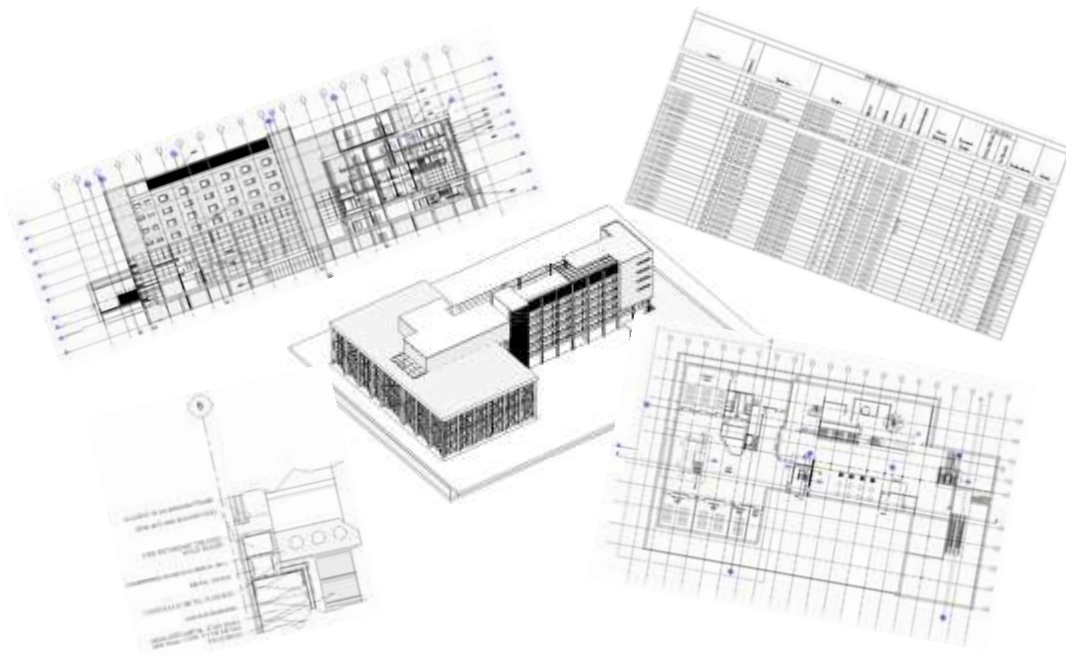
BIM is an intelligent 3D model-based process



4

Application Highlights: Building Information Modeling

3D-Documentation

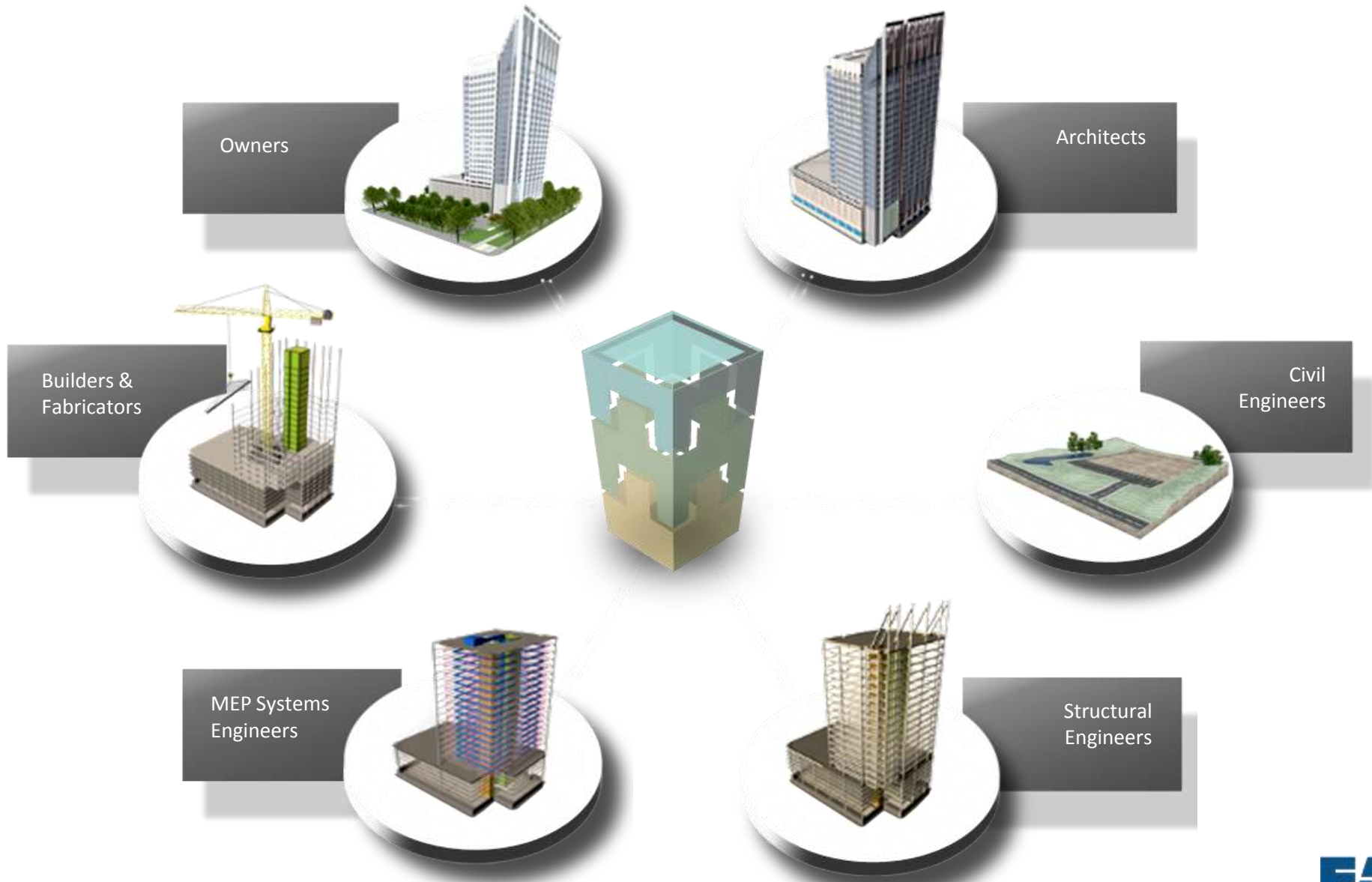


Previously drawing centric
Data duplication – errors
Dumbing down of 3D data

- > Now model based
- > Single model - lots of views
- > Maximum reuse of data
- > Visualisation and Simulation

4

Application Highlights: Building Information Modeling



5

Future Trends of 3D Laser Scanning: Seamless Data Sharing



6

Conclusion



The advancement and benefits of GIS solutions has and will continue to empower Government and Enterprises with more accurate, real time data.

In addition, the workflow has been simplified with the advancement of GIS hardware and software technology, making the solutions more accessible to more users.

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