Cell tower equipment requirements

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So how does one create or access a single source of reliable data to manage lifecycle of towers? Many people think 3D models constructed using images captured via drones are the answer. Some suggest using Building Information Modeling (BIM) workflows can solve the need. Digital Twins, acting as a synchronized replica of the asset, could be a possible solution. But before selecting a solution, consider what is required to maintain modern cell tower infrastructure.

The most common tower data accessible to those responsible for maintenance and operations are generally construction document packages and/or idealized engineering models. These are considered as-designed models and are helpful to understand the intent of the construction, including installation of equipment, but do not reflect an accurate depiction of the current status. The moment construction is completed, the fidelity of that data is lost. Was everything installed correctly? Has weather or other aspects of mother nature affected the tower?

To optimize tower tenancy and accelerate important projects like 5G expansion, an accurate as-built model is necessary. This enables owners and operators to make actionable decisions based on the current state of the tower, so truck rolls aren"t wasted and proper maintenance can occur. A tower maintenance system must provide a realistic view of the asset.

Continuously updated government regulations, technology evolution, increased tenancy, and the ongoing demands of 5G deployment all mean that tower infrastructure data is in a constant state of change. The majority of this data is recorded manually through various file formats and systems, so it can be very difficult to track these changes. Without maintaining a single source of reality in a central location, the risk of inconsistent analysis increases, and data-based decisions are more difficult--or impossible. A tower maintenance system must be able to handle change management.

Cell Tower maintenance is unique to many other infrastructure asset types. And the tool that supports the maintenance should be purpose-built around these needs.

Many solutions are built around general infrastructure assets. They can do the job, but they aren"t built solely to support cell tower maintenance and optimization. The tower business model is unique being that it is based around leasing tower spaces to mobile network operators. This means it is crucial to optimize tenancy, be aware of all equipment, and note available space at each step of the workflow. Only a system built and optimized for cell towers holds tools that support this type of workflow, reducing the need for customization.

Utilizing software that is specific to cell towers reduces the need for customization and allows owners and operators to optimize the value they derive from tower infrastructure. A tower maintenance system must be purpose-built to support cell tower workflows.

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The process of reconciling data from multiple sources into a single model typically requires 60-70% of valuable engineering time. Engineers must estimate and make assumptions based on the last analysis or 2D pictures from the last inspection. The lack of automation involved in this process strains resources causing delays and loss of revenue.

Modern technology can help automate these cumbersome processes. Artificial intelligence (AI) and machine learning (ML) can be leveraged to automatically identify tower equipment. Reports can be generated, and analysis can be performed automatically, saving hours of dedicated engineering work. A tower maintenance system must be able to automate manual processes.

A digital twin encompasses all the data and functionality necessary to maintain the lifecycle of cell tower asset, including processes involving design and construction. An evergreen cell tower digital twin can enable one accessible, automated view of the truth that is aligned to operational workflows and enables true windows into profitability and value.

A tower digital twin is capable of continuously updating its dataset to remain current and serve all users with the best possible information. It"s economical too. Many of the digital twin software solutions are licensed at the server-level and deliver multi-user concurrent access that is needed for teams across the company to leverage and update the model and collaborate effectively.

Digital twins are a game-changer for the telecom industry. They play a pivotal role in modernizing industry practices by serving as a live model and single source of truth, combining as-designed models, as-built models, and live sensor data throughout the lifecycle.

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