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# Infrastructure Verification as a Service

*A standardized approach to infrastructure documentation and maintenance*

BY BETHANY RÜDDEK, RTPM, Concert Technologies

It is a widely accepted truth that all information and communications technology (ICT) infrastructures require some level of documentation in order to be properly maintained. From the specific contents of their spaces and pathways to cable endpoint documentation, most organizations *want* accurate documentation of their infrastructure, while few actually *have* it. The disparity between the ICT documentation “haves” and “have-nots” is attributable to the lack of a standardized approach to conducting a comprehensive, and verifiable, survey-documentation-maintenance effort against an existing infrastructure.

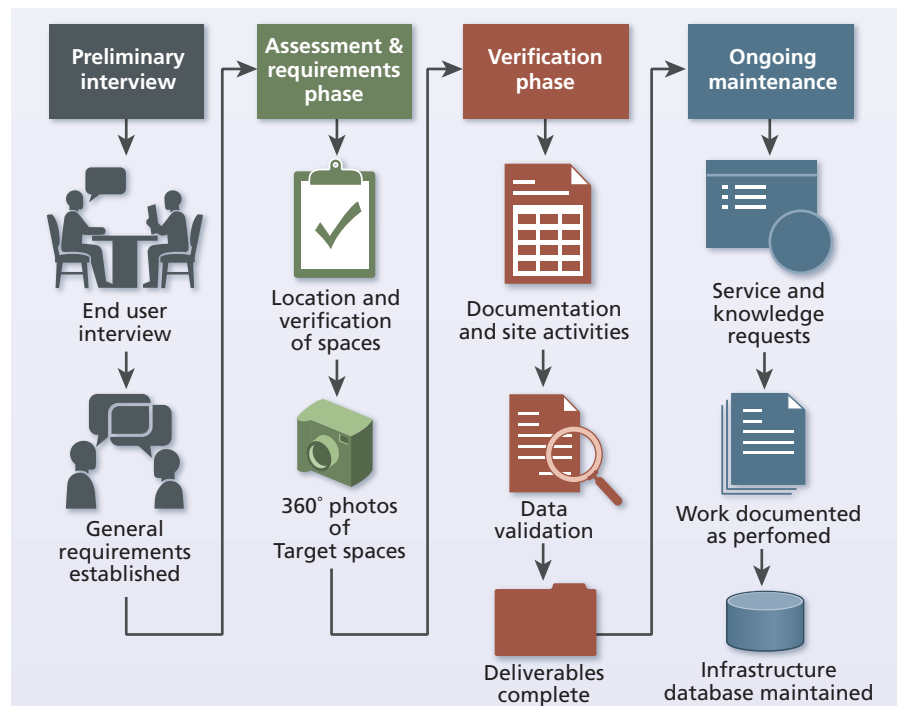
Differences in approach from one contractor to the next, or the lack of a standard of approach in cases where ICT documentation and maintenance falls to internal resources, often lead to irregularities in the execution of the effort, inaccurate or incomplete data, and improperly maintained data (if it is maintained at all).

In the case of internal survey-documentation-maintenance attempts, organizations often are met with a series of obstacles that prove difficult, if not

impossible, to overcome independently; resource limitations coupled with issues such as key person risks, lack of standardized training, conflicting requirements, and access coordination, all amount to fracture points inherent in most internal programs.

As the growth of the infrastructure outstrips the accuracy of the initially collected data, additional surveys are needed to produce a “here-and-now” inventory audit, with little (or false) expectation of any effort to maintain the resulting documentation beyond the immediate need of the current project.

This mentality has helped to cause industry-wide resignation to infrastructure disorganization, resulting in its acceptance as the de facto baseline for new projects. While every other inch of our industry is governed by one



The Infrastructure Verification as a Service (IVaaS) program structure includes four phases: Preliminary end-user interview, Requirements Phase, Verification Phase, and Ongoing Maintenance.



During the preliminary end-user interview, the site's basic information is collected and end-user needs are determined.

standard or another, the infrastructure documentation and management segment has never received the same level of attention, and, as a result, continues to be an issue.

In order to effectively implement a large-scale survey-documentation-maintenance project, the effort demands an expertise not only in ICT, but also in project management. Effective planning and implementation against an established set of processes and procedures is necessary to ensure the success of the effort.

*"The key, I believe, is to have someone 'own' the responsibility of keeping documentation updated," says Cindy Montstream, RCDD, director of technology support and training with Legrand North America.*

Unfortunately, most organizations eager to pursue an infrastructure documentation and maintenance effort do not have an internal project management office (PMO), specializing in ICT, dedicated solely to their infrastructure.

The severity of the matter became abundantly clear to us at Concert Technologies during a three-year documentation effort on the grounds of the

Walter Reed National Military Medical Center. Having been an industry leader in the low-voltage cabling industry for more than 30 years, we were aware of the challenges inherent in the collection and maintenance of accurate infrastructure records, but it wasn't until the Walter Reed project that we realized how prevalent the problem had become. Comprising 86 multi-level buildings, more than 4,000 backbone cables, and an outside plant (OSP) landscape containing more than 300 manholes/hand-holes, as well as 517 telecom closets, the Walter Reed facility posed an enormous challenge in communication, access, and data collection.

In the long run, the project was not necessarily a successful one—at least, not in the way we thought it would be. While the site presented a series of obstacles that consistently undermined our ongoing project

efforts, the silver lining finally came when we realized the hurdles that set us back also provided us with the information we needed to build a program framework designed to handle the very issues we encountered. Not only did the site help us realize the depth and complexity of survey-documentation efforts inherent in neglected infrastructures, but it also provided an experimental environment from which we were able to develop and refine the necessary processes for approaching and mitigating the difficulties we face.

The scale of the end-user site compounded with near-constant demolition of buildings, erection of new structures, and access restrictions in every arena of the facility presented an ideal dataset to help us develop a standardized solution to one of the industry's biggest problems of accurate surveys and maintenance.

### Infrastructure Verification as a Service (IVaaS)

After analyzing existing program structures, considering our lessons learned from Walter Reed, and those of other organizations across the industry, it became clear that infrastructure



The Assessment and Requirements Phase includes collection of 360-degree photos, observation and recording of on-site conditions, space location/access, and other site-specific information.



The “meat” of the on-site effort is the Verification Phase of an IVaaS solution. This phase uncovers the inventories of spaces and pathways, including thorough documentation of those inventories—including actions such as cable-label placement, entry-point and conduit mapping, and backbone cable tracing.

survey-documentation-maintenance efforts must begin with a standardized process, structured enough to guarantee set results every time, but customizable enough to suit the needs of individual facilities.

Additionally, for the integrity of the data to be guaranteed over the lifespan of the infrastructure, the program would have to utilize an “as-a-service” model.

To build a program of this complexity, we relied on decades of experience in project management and program design to develop a solution that would allow for effective implementation at facilities of any size, with infrastructure obstacles of any complexity.

The resulting program, VeriStructure, is the industry’s first Infrastructure Verification as a Service (IVaaS) solution. Managed from one central location by BICSI-certified RCDDs and RTPMs, the IVaaS solution combines the flexibility of a modular program design with the governing authority of effective project management standards to provide organizations with accurate infrastructure accounting, comprehensive deliverables, and the continuing support of ongoing maintenance.

By leveraging the skillset of a team of qualified ICT project managers, the IVaaS model takes the responsibility for accurate data generation and maintenance out of the end user’s hands, and eliminates the following internal risks.

- Alternative employee engagement
- Key person risks (job precedence, illness, job changes)
- Obsolete or unsupported software
- Costly and resource-consuming training programs
- An absence of process structure (lack

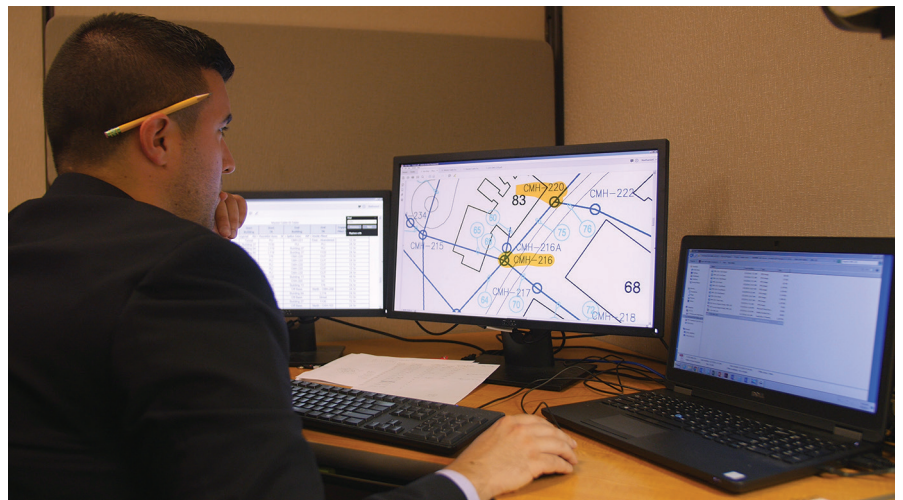
of subject-matter expertise)

- Time constraints

The IVaaS solution is structured to be manageable on a large geographic scale, eliminate lengthy service request processes, and minimize network service disruptions. The solution works throughout the entire lifespan of the site and is easily customized to fit the needs of unique environments. To preserve and maintain the integrity of the collected infrastructure documentation, the data is managed and continuously updated by Certified Personal Verification Specialists (PVS) through a comprehensive database, ensuring changes are captured and recorded as they happen.

### Developing a successful program structure

The complexity of designing a standardized model required the development of a successful set of processes that break down the complicated and time-consuming survey, documentation, and maintenance activities into individual, defined phases. Each phase is governed by overarching project management principles, and each is designed to be implemented based on the dataset of



The Ongoing Maintenance phase ensures future moves-adds-changes are recorded and maintained in the infrastructure database throughout the site’s lifespan.



A survey of a manhole may uncover air-quality dangers, which would immediately halt the audit process and leave spaces undocumented. The IVaaS solution includes an assessment of the site, which allows for confined spaces to be evaluated safely, without descent; this “heads-up” approach to surveying means deeper-dive survey activities can be planned with confidence.

its predecessor phase; this modular program design ensures the data collected from each phase carries into the next, culminating in a complete “capture” of the site’s telecommunications spaces and pathways, their contents, and associated cable routes.

The Preliminary Interview—the first phase of the program—serves to establish the information necessary for the project manager to develop a solid scope of work. It is during this phase that the site’s basic information is collected, and the needs of the end user are determined.

The second phase of the program, the Assessment and Requirements Phase, is designed to observe and record the on-site conditions, space location/access, and other site-specific information that is necessary to design and launch a thorough survey effort. This phase includes the collection of 360-degree photo documentation, space conditions, and other observation-based data collection.

Additionally, due to the simple nature of the Assessment, the Preliminary Interview can often be easily rolled into this phase,

*“Having accurate documentation for service work allows us to significantly reduce our time on-site,” explains Alberto Luna, BICSI Technician and owner of Analyzed Low Voltage LLC—testifying to the importance of the information gathered during the Assessment and Requirements Phase.*

Single survey efforts often expose obstacles, such as access restrictions, water-filled OSP spaces, and manhole air-quality dangers, that can immediately halt the audit process. As a result, many spaces go unsurveyed and undocumented. Additionally, it is not always possible to investigate every area in one effort.

To prevent important spaces and pathways from being passed over due to inaccessibility, the IVaaS solution calls for the Assessment and Requirements phase to establish the baseline information

needed for the development of a comprehensive scope and work plans for the deeper-dive, investigative phase of the program: the Verification Phase.

The Verification Phase is the “meat” of the on-site effort. Designed to uncover the inventories of the spaces and pathways identified during the Requirements Phase, the Verification activities include thorough documentation of those inventories and the performance of action items, such as cable label placement, entry point and conduit mapping, and thorough backbone cable tracing.

*Jerry Allen, president of CSRS, LLC comments, “Knowing conduit fill and availability in campus manholes allows you to plan more quickly and efficiently.”*

The activities performed in the Verification Phase produce a complete “capture” of the current physical infrastructure as it stands at the close of the phase. This baseline becomes the starting point for Ongoing Maintenance, the final phase of the program.

Without the implementation of Ongoing Maintenance, all documentation and verification efforts up to this point would become obsolete in short order. As Christian Holbrook, founder and chief executive officer of WireCAD, notes, *“The entire effort of documentation is meaningless if the output is not trustworthy.”* As such, the Ongoing Maintenance phase ensures that all future moves-adds-changes (MACs) are recorded and maintained in the infrastructure database throughout the site’s entire lifecycle. Information cross-checks and data verification are performed during future site visits, protecting the life and stability of an organization’s infrastructure, and ensuring the continued integrity of the foundational data collected during the preceding phases.

Not only does the Ongoing Maintenance Phase give the end user

the opportunity to relieve themselves and their limited resources from the uphill battle of infrastructure documentation and maintenance, it also gives them the ability to regularly plan future projects based on up-to-date, actionable data, thereby minimizing the risk of network disruptions, overblown budgets and protracted timelines. *Mark Pohl, telecom officer for Los Angeles World Airports, reminds us, “Commitment to cable management is a full-time job.”*

### Futureproofing the standard

ICT survey-documentation-maintenance efforts have been performed on an industry-wide, unstandardized basis up to this point. The shortcomings associated with un-engineered, and often poorly executed solutions have compounded over decades, impacting organizations to the point that the

historically available solutions cannot address their infrastructure disorganization issues with any great success.

The IVaaS solution is the ideal model to provide a scalable, long-lasting solution to infrastructure documentation and maintenance issues. With the application of IVaaS, infrastructure documentation and maintenance are put into the hands of experts, alleviating time and resource-consuming investments on the part of the end user. As more qualified project management teams are tasked with verifying and maintaining infrastructures using the IVaaS solution, the industry will benefit from the standardization of a solution to one of the most challenging issues it faces today. ♦

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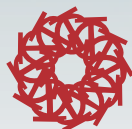
**Bethany Rüddek**, RTPM is VeriStructure program manager with Concert Technologies ([www.concerttech.com](http://www.concerttech.com)).

## VeriStructure™ wins top honors at Cabling Innovators Awards



Concert Technologies’ Infrastructure Verification as a Service (IVaaS) program earned top honors in the 2018 Cabling Innovators Awards, administered by Cabling Installation & Maintenance magazine (CI&M).

Patrick McLaughlin, chief editor of CI&M, commented, “The IVaaS program is Concert’s latest innovative means of eliminating the ambiguity that can cause chaos on a jobsite. It puts experience and expertise to work, using new methods and approaches, for the benefit of end-user organizations. IVaaS is a true innovation worthy of the Platinum-level honors it has received.”



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