

DCIM: Is it a Product or a Solution?

Managing Infrastructure

BY DONALD L. BEATY, P.E., FELLOW ASHRAE; DAVID QUIRK, P.E., MEMBER ASHRAE

In the May 2013 Data Centers column, we identified that the data center industry's response to the "intensifier," the "accelerated aging chamber," and ever-increasing speed-to-market pressures led to the development of the data center infrastructure management (DCIM) industry.

It's more than two years on, and DCIM remains a relatively young concept representing an emerging class of IT infrastructure products, but it continues to grow at a rapid pace. As a high-level recap, DCIM is a category of products created to extend the traditional data center management function to include all of the physical assets and resources found in both the facilities and information technology (IT) domains.

With the marketplace growing, today there are several DCIM products that allow users to monitor/manage their data center. But who determines the appropriate DCIM product for a given application? Who are the distributors, the specifiers, the installers, and the integrators?

To date DCIM has been sold as a product to be installed by the manufacturer. MEP engineers have had little to no part to play in the DCIM marketplace. This gap, in part, is to blame for the fact that DCIM is sold as a product and not a solution. But are consulting MEP engineers capable of tackling this industry challenge or is it more appropriate for a new emerging class of systems integrators?

This column will examine the answers to these questions and reintroduce the "solution" element to DCIM products.

What is DCIM?

Data center infrastructure management (DCIM) provides tools to help administrators monitor and manage their data center and information technology (IT) operations. DCIM deployments integrate IT and facility management disciplines to centralize monitoring,

management and intelligent capacity planning of a data center's critical systems.

Since DCIM is a broadly used term that covers a wide range of data center management values, each deployment will include a subset of the full DCIM value needed and expected over time.

One of the primary goals of DCIM software is to provide a centralized management system to manage the data center or IT utilities.

Some of the key components that DCIM includes are capacity management, rack utilization, power management, cooling management, asset management, and change management.

DCIM Products

In 2014 more than 75 vendors self-identified their offerings to be part of the DCIM market segment. Confusion exists in the market today about the scope of what DCIM should be, and participants in this space are seeking to define their brand by offering full-scale solutions that include complete power and cooling and IT infrastructure visibility, control, and analytic capabilities.

DCIM suites consist of software that is wide-ranging and integrated in nature. The existing suites touch upon both IT and facilities and may have a bias (depending on the vendor's heritage) towards either IT asset life-cycle management or facilities monitoring and access.

To date DCIM has been sold as a product, but what sort of product and sold by whom? Currently no distributor or reseller models exist for the DCIM vendors.

Donald L. Beaty, P.E., is president and David Quirk, P.E., is vice president of DLB Associates Consulting Engineers, in Eatontown, N.J. Beaty is publications chair and Quirk is the chair of ASHRAE TC 9.9.

This leaves the specification and sales of the DCIM products to the vendors or consulting MEP engineers. Unfortunately, for many traditional MEP engineers, a number of hurdles exist to specifying DCIM products, which will be covered later in this column.

DCIM Components

DCIM is made up of several components that make it a unique industry solution that crosses many traditional boundaries. Those components can consist of hardware and software. It consists of traditional BAS components, power monitoring, and more. It frequently includes the integrations of various software applications, too.

The following is a breakdown of the general components commonly found in DCIM solutions.

Capacity Management

Capacity management is the ability to manage and optimize data center resources to avoid stranded capital and just-in-time services. Some of the most important features of capacity management include rack space, power, cooling and network connectivity.

IT Rack Utilization

Rack utilization is the ability to take advantage of the rack space within a given rack. The primary goal of rack utilization is to get as close to 100% utilization as possible. One hundred percent utilization may not always be possible due to a data center's power and cooling constraints.

Power Management

Power management allows an operator to manage and measure power consumption to determine how energy efficient their data center is by using metrics like power usage effectiveness (PUE) (covered in previous columns).

It provides useful data on power reliability, quality, fault detection and diagnostics, and how much power devices are using while also permitting the discovery of whether certain devices are using excessive power. And, it monitors the amount of power being consumed per rack; this is important to maintain power redundancy and optimize power utilization.

Cooling/Temperature Management

Cooling/temperature management enables the intelligent location of hot spots or other areas within the data center where high temperatures may be an issue.

Asset Management

Asset management enables the user to keep an accurate inventory of their data center assets, tracking the specific models of equipment such as servers, networking equipment, storage devices, power distribution units (PDUs), patch panels, and even IP addresses.

Change Management

Change management lets the user keep track of detailed information about an asset's configuration.

Some examples of change management would include whether a server's hardware has been upgraded or if the server has been moved to a new rack location.

Having DCIM software in place can reduce the time spent monitoring these changes and helps make sure the user is keeping an accurate inventory of the data center's complex systems.

Consulting MEP Firms and DCIM

In many cases consulting MEP firms are expected to be the ones who specify new products for data center construction projects, whether new or retrofit.

However, DCIM is too immature and too broad to have been captured in any traditional industry specification section. To this day there is still no standard specification for Division 25, which was intended for building automation systems and intelligent systems integration.

Many DCIM companies have approached MEP firms to serve as the sales channel for their DCIM products. However, without the proper tools and ability to monetize the risks of implementing a complex solution like DCIM, this approach has often not been successful.

The gaps for typical MEP firms and specifying DCIM are above trivial. Historically MEP firms have distanced themselves from specification of building automation systems. As controls migrated from pneumatics, to electronics, to DDC, and now integrated smart IP-based systems, MEP engineers have turned more and more to the product vendors and contractors themselves.

DCIM goes steps further and incorporates software integration, customization, and even development based activities. Further, DCIM involves diving into the interworking of a company to understand and replicate their workflow within the DCIM solution. Further still, these different hardware and software solutions, both new and existing, must all be integrated to form

a single graphical user interface (GUI), common database structure, and a singular backbone for all the data.

With such complexity, even the controls contractors have distanced themselves from DCIM integrations.

Systems Integrators

There is no question DCIM has numerous value propositions, each unique to a given client. DCIM value includes:

- Enable continuous optimization of data center power, cooling and space;
- Integrate IT and facilities management;
- Help achieve greater efficiency;
- Model and simulate the data center for “what if” scenarios;
- Show how resources and assets are interrelated and improve the management thereof; and
- Improve business processes and workflow for greater end-to-end efficiency and speed to market.

Reviewing each of the value proposition statements listed above raises the question of whether the implementation of a product can deliver the value.

Today, complex systems integrations are addressed by systems integrators, sometimes referred to as master systems integrators, intelligent building integrators, etc.

Even with today’s open protocols and architectures, significant custom systems integrations are necessary with DCIM solutions. Differing software protocols, networks, firmware compatibility, software applications, and databases often require development or customizations to integrate the data.

Perhaps the most challenging aspect of DCIM systems integration is understanding the client’s value system and integrating that into the DCIM product or vice versa. Many DCIM products are built with the idea that they get implemented independent of learning the client’s value system and their processes. For some applications this approach to “serve up data” may work. For other applications, the client’s value system and processes necessitate a ground-up approach to integrate the workflow from the start.

Differentiating between these scenarios and collecting sufficient information to apply the latter approach before selecting a DCIM product requires a whole different approach on the DCIM project. Currently, there is no simple road map for determining the difference.

Products vs. Solutions

The DCIM marketplace is currently struggling to identify itself as a solution provider rather than a product provider. It’s struggling to identify selling partnerships or distribution models like the DDC market did before it.

To this point in time, much of the DCIM market has focused on the maturing of their products and their technology partnerships necessary to produce all the necessary hardware and software integrations via driver and API development, respectively.

However, in the race to refine products, the holistic approach and value proposition that comes with a business driven solution may have been lost.

Today’s DCIM products are largely data driven products. This means they are created on platforms capable of gathering lots of data with the idea that they can produce business results once that data is in hand. However, the largest portion of the value comes from what’s done with the data.

Business driven solutions focus on business drivers, starting with the highest level key performance indicators and working down to the day-to-day workflow within the data center. Often it’s not how much data you have, but how well you connect the small amount of data with efficient workflow processes and intuitive GUIs that makes all the difference.

The difference between a product driven marketplace and solution driven marketplace is best defined by meaningful business results.

Closing Comments

DCIM has started as a product development and product offering from the industry. This has resulted in a slow and difficult start to the industry.

Traditional consulting MEP engineers are not equipped with the in-depth experience necessary to implement and integrate complex hardware, software, and workflow solutions.

Systems integrators are better equipped and trained to perform complex integrations of hardware, networks, GUIs, and software. They are also sometimes experienced with integration of business needs, workflow, processes, and DCIM products. DCIM is a relatively young set of products that are on their way to maturing into solutions. To get there, they will need to explore further use of systems integrators who can incorporate business intelligence and workflow into the DCIM products. ■