IT/OT Convergence: More Than Just Connecting Networks

BY LUIGI DE BERNARDINI | FRI JUL 22 2022

In 2016, when I wrote about IT/OT convergence as one of the key mantras in smart manufacturing, my opinion was that IT/OT convergence was not only a technical issue, but an organizational one. In essence, this idea of convergence is not just about connecting two networks, but creating an organization where responsibilities are unified. At the very least, the IT and operations managers (CIO and COO) need to have partly common and overlapping goals and targets, which force them to work cooperatively. At the time, I noted that this convergence was not something that could happen quickly with no pain, but that it was a journey that needed to be started as soon as possible since it's one of the founding pillars of Smart Manufacturing.

After six years, my personal view is that things have not changed much and that the journey remains a long

one. Following are my current thoughts about where industry is at on this journey and what remains to be accomplished.

Mature technologies

IT and OT networks are now quite easy to connect safely, allowing data to be shared between the two worlds. Most of the new devices installed at the automation level are ready to communicate with the outside world using at least one of the widely used communication protocols. Many gateways are also available on the market to translate OT-specific communication protocols to ones the IT network can understand and vice versa. In spaces where older PLC-based or electromechanical automation technologies are still running, several tools exist to collect and transfer useful data.

Cybersecurity remains a critical attention point, and it always will be. While protection mechanisms will continuously become more sophisticated, the attack techniques will also continue to evolve and render those protection systems inadequate. We've learned how to live with this in the business world and accepted that there will never be 100% protection. Personal precautions, training, and processes need to be in place to ensure this, but the fact that the risk is not zero is not stopping any adoption of new technologies or systems. The same will be true in the OT world.

IT/OT relations have improved

IT is progressively more involved in OT projects, including plant digitization projects involving technologies such as MES, MOM, IIoT, and OEE. Sometimes an IT representative is just part of the working group, other times they're part of the steering committee, and sometimes they're leading the initiative. In many countries, incentives exist for Industry 4.0 initiatives, and one of the criteria to obtain these incentives is to connect production machines and ERP. Especially in smaller and less organized companies, such incentives have helped make collaboration between IT and OT be viewed as having high economic value, while forcing the two departments to work together.

A common culture is still to come

If technology and organizations have improved in the last six years, I cannot say the same for the culture. What I thought was missing—common goals and common understanding of the reciprocal needs—often times remain missing. In many companies, the IT/OT relationship is still difficult and conflictual. Goals are different, language is different, methodologies are different, project approach is different, cost perception is different, and budgets

are different. Sometimes IT drives and sometime OT drives, and it's not unusual to hear one complain about the other, of the lack in understanding their real needs (typically OT vs. IT) or of the lack in understanding and considering the new technology opportunities (typically IT vs OT). What surprises me most about this is that, in many companies, these issues still have not been effectively addressed.

As a result, system integrators are frequently required to act as marriage consultants, facilitating dialogue and helping the two parties understand each other and reach agreement on reciprocal needs. It's not an easy role to play and it requires understanding, as well as specific competencies and skills, that are typical of both roles. It sometimes requires integrators to act more as change facilitators than as implementation engineers. This can be problematic as it requires negotiation abilities and attitudes that are not typically part of the integration engineering skillset. But it all can be fascinating, too—when it works—because it enables integrators to be the enabler of a powerful transformation that generates enormous value.

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