

Navigating Steel's Digital Landscape

A Perspective on AIST's Digital Transformation Forum for the Steel Industry

by Sam Kusic

As the saying goes: a journey of a thousand miles begins with a single step.

And for 244 steel industry professionals who are helping to devise digital strategies for their companies, one of their first steps occurred in March, when they attended AIST's inaugural Digital Transformation Forum for the Steel Industry.

Held in Pittsburgh, Pa., USA, the three-day technical conference was meant to provide those who have a hand in digitalization efforts — or those who are trying to understand it better — with a comprehensive overview of the fundamentals.

"The conference was designed with what many in the steel industry have been asking about regarding digitalization and the many advanced technologies identified under Industry 4.0," said Mike Dudzic, one of the conference's lead organizers and general manager of the process automation department at ArcelorMittal Dofasco G.P.

The result of a joint effort between AIST's Electrical Applications Technology Committee, Sensors Subcommittee and Computer Applications Technology Committee, the conference set about to explain what digitalization is and why it is important to the steel industry; to review the core technologies that fall under the Industry 4.0 umbrella; and to highlight some of the ways in which steel manufacturers already are leveraging digital technologies to improve production, safety and reliability.

The forum also was meant to provide attendees with an opportunity to compare notes with their peers and hear directly from a number of technical experts. Dudzic said the conference was unique in that it was the first digitalization conference in North America dedicated exclusively to the steel industry.

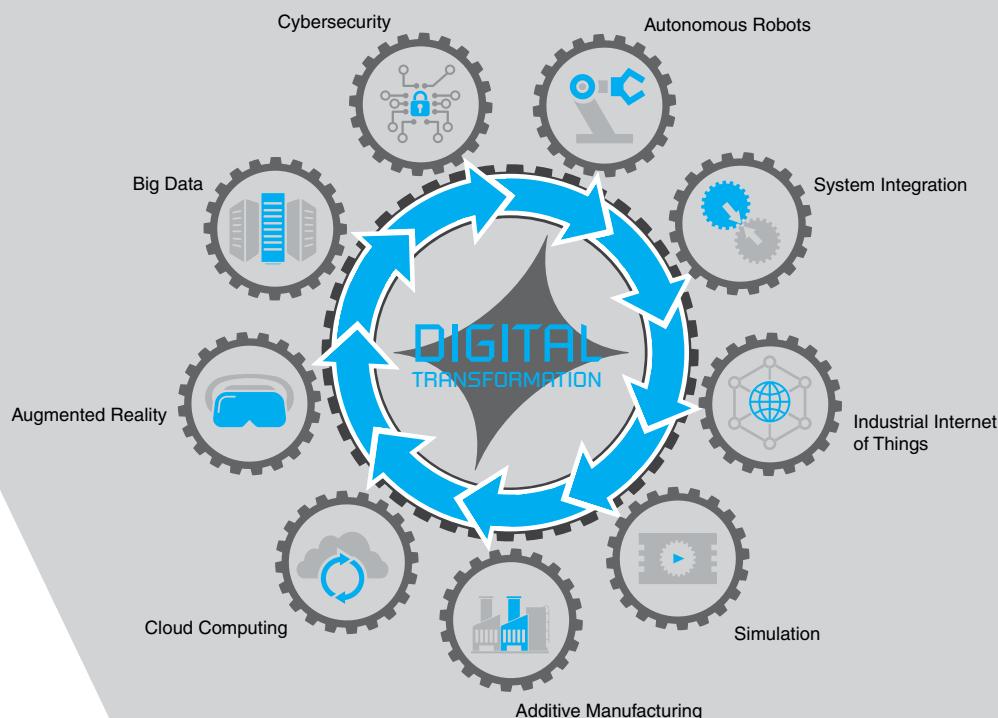
The conference drew attendees from 12 different countries, including India, South Korea and Germany. But no matter their home base, the attendees largely had one thing in common — they all are trying to fully understand how the industry will evolve and how best to take advantage of the new tools.

That goes even for those at the top of the chain of command.

"I thought engineers were difficult to understand, but information technology has them beat, in spades," quipped R. Joseph Stratman, Nucor Corp.'s retiring chief digital officer. "Every day, I feel like I'm drinking from the fire hose," he said in giving the forum's Day 2 keynote presentation.

Stratman allowed that trying to make sense of the new digital landscape can be challenging, especially for those who don't come from an information technology background. But, he said, it's important to bear in mind that from a company perspective, digitalization is not a race to be won, it's a process of continual improvement.





“Digital transformation is not a destination; it is a journey. It is a climb up a mountain that has no top,” he said.

But while the mountain may have no top, it has multiple faces. And the key question before many at the moment is which face does one attempt to ascend?

Stratman advised attendees to look toward the peak and work down.

“Any good digital transformation opportunity begins with the end (goal) in mind. It is very easy to waste resources developing solutions for poorly defined problems. The more clearly you can define your objective, the more precisely and more efficiently you can get to your answer,” he said.

“You must have a vision of what value will be derived by solving a particular problem. Ask yourselves,

‘How much upside is there if I address and answer this problem?’”

Attendees also heard from Stephen Pratt, founder and chief executive of Noodle.ai, a Silicon Valley firm that provides supercomputing power as service to manufacturers — most notably to Big River Steel.

Pratt told the audience that one of the primary drivers of this latest industrial revolution is dramatic changes in the cost of data storage and computing power.

Since 2000, the cost of computer storage has come down 100,000-fold, making it economically feasible to save vast amounts of data. At the same time, the cost of computer processing power is down even more, by a factor of one hundred million, he said.





Consider, he said, that in 2000, the world's fastest computer could perform one million million calculations per second. It cost millions of dollars to build and was operated by the U.S. government. Now, he said, the fastest computers are capable of one thousand times those speeds, and they exist within the commercial realm.

"Now petaflop computing is affordable and within reach," he said. "And if you take a petabyte of data and multi-petaflop computing power, all of a sudden, you can start finding amazing patterns and amazing subtleties in (manufacturing) operations."

When it comes to digitalization, he said, "The trick to getting ahead is to get started," he said. And sooner rather than later.

"They say the best time to plant a tree was 10 years ago; the second-best time to plant a tree is today. I would say the best time to start collecting your sensor

data was probably about two years ago. The second-best time is to start today."

Some, to be sure, already have.

Sam Matson, of Commercial Metals Company, who spoke during the forum's roundtable discussion, said good data is the foundation of any digitalization effort.

"It's all about the data," he said. "You really can't do much until you have the data, so that's what we're working on now — collecting data from our processes and getting it stored in a way that makes sense."

But he and other presenters warned that while collecting data is a critical step, it is not an end unto itself. Data needs to be sorted, refined and put to productive use. And along the way, you have to persuade the skeptics that it's worth the effort.

That, he said, requires rigorous change management.





“You have to help everyone to understand that you’re not just collecting data to fill hard drives. You’re using it to help better understand what’s happening,” Matson said.

But Craig Thornton, managing director of Hatch Digital, cautioned that there will be setbacks along the way. He cited a statistic that 70% of digital projects fail, and they fail for five main reasons.

Chief among those, he said, is that an organization fails to recognize the business impact of the change they are trying to implement. Another, he said, is that a project is launched without the right talent and expertise on board. And still another, he said, is a lack of collaboration among teams on a project.

Stratman said that in his experience, he has found that another way to fail is to start by tackling too large a problem. A better approach, he said, is to start small. Taking on a big project, he said, can be fraught with danger.



“At any point along the way, a misunderstanding of the information, a bad assumption, or an error of omission of a key variable can render the results meaningless or, even worse, lead you in the wrong direction,” Stratman said.

“Great is the enemy of good. You must first be good on your way to great. And you must do it in small steps or you can be overwhelmed, and you can lose your way on the journey,” he said. ♦

1. Panelists fielded questions from the audience (left to right): Greg Manfredi, SSAB Alabama Inc.; Steven Bugajski, United States Steel Corporation; Chris Carney, AK Steel Corp.; Yury Krotov, Steel Dynamics Inc. – Flat Roll Group Butler Division; Denis Hennessy, Big River Steel; Donald Hughes, Nucor Steel–Decatur LLC; and Michael Dudzic, ArcelorMittal Dofasco G.P.

2. The “Core Team” that organized the forum included (left to right): Yufeng Wang, SSAB Americas; Christopher Burnett, Thermo Fisher Scientific; Michael Dudzic, ArcelorMittal G.P.; Donald Hughes, Nucor Steel–Decatur LLC; and Liwei Zhang, ArcelorMittal Global R&D – East Chicago.

3. Presenters on the second day of the conference included (standing, left to right): Andreas Quick, iba; Johannes Bauer, UL International Germany GmbH; Alexandre Cote, ArcelorMittal Long Products Canada; Heiko Wolf, PSI Metals GmbH; and Jeff Yeager, AM/NS Calvert LLC; (seated, left to right): David Kober, IBA Americas LLC; Michael Dudzic, ArcelorMittal Dofasco G.P.; Chenn Q. Zhou, Purdue University Northwest; and Osvaldo Bascur, OSIsoft.

4. R. Joseph Stratman delivered one of the forum's three keynote presentations.