

IMTS in Review: Technology Round-Up of Findings and Trends

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While I verified what some of the preliminary findings suggested as potential manufacturing trends (for example, converging technologies, mobile data solutions and the continued emergence of additive manufacturing) there were a few other demonstrations that you had to see to believe (such as collaborative manufacturing, novel hard-machining and next-generation parallel kinematic solutions). Not everything had to be “novel” or “disruptive” to catch my attention as there were several traditional manufacturing advancements and market entries that are well-positioned to better enable manufacturing from the small job shop all the way to an OEM or Tier 1 supplier. These included advancements in tombstones, quick fixturing, deburring/polishing and even recycling!

My pre-show suspicion of convergence was explicitly confirmed as a common trait in many technology offerings from exhibitors. Whether it was mobile, wireless platforms for data collection like Balluff or Microridge or an RFID-based tooling solution from Cribmaster, these technologies were capturing multiple flavors of data (identification, inspection points, sensing I/O) yielding information for the mobile or remote stakeholder. However, convergence went beyond just the data transfer aspects of manufacturing because firms such as LNS America, Inc. and Edge Technologies were exhibiting offerings that enable a more streamlined process for automation and increased visibility of their shop floor value stream with MTConnect-enabled bar feeder applications.

Interoperability and open-source may go hand-in-hand as demonstrated by MTConnect Institute’s display of versatile applications from its members. The connection to open-source may be made by firms like Yaskawa Motoman. Yaskawa Motoman demonstrated their dual-arm robot that utilizes open-source based Robot Operating System (ROS) programming emphasizing their participation in the ROS-Industrial program. ROS-Industrial was initiated by Southwest Research Institute (SwRI) and is an enabler for new applications and reduces project costs for industrial robotics (<http://www.swri.org/4org/d10/msd/automation/ros-industrial.htm>). If MTConnect easily enables the access to data and the open-source programming allows for standard manipulation of that data, then there could be significant potential in improving the state of manufacturing that currently may only be experiencing its dawn.

An awesome display of collaboration at its finest was Local Motors building of the IMTS Rally Fighter. Given a work week’s timeframe, a collaborative design fashioned from across America and the “no-guts, no-glory” work ethic of the Local Motors team, the completed 2012 Rally Fighter was unveiled Saturday morning in the Emerging Technology Center. As technology better enables collaboration between typical competitors and disparate contributors, we may see a boom in business for Local Motors and other original equipment manufacturers in more industries. Collaborative manufacturing only starts with the engineering!

The pervasiveness of additive manufacturing was evident on a quick walk through many of the halls. To have machines exhibited that are currently building titanium jaws, hip and knee replacements (accepted by the US Food and Drug Administration, no less!) alongside complex aerospace components was a powerful display of the technology's continual maturity and increased industry acceptance.

Parallel kinematics seemed to have a bit of a renaissance as a more robust manufacturing solution with ICON Technology's Tripod Powerflex, which enables higher degrees of access to part features in a much larger volume than in prior offerings. The difference this year was the improved rigidity and accuracy, claimed to be comparable to traditional CNC machining centers today. While the robotics industry, in general, has historically incorporated the speed of pick-and-place hexapod solutions, Yaskawa Motoman did demonstrate its recent hexapod advancements for both part handling and material removal.

Hard machining took center stage with MAG IAS' advancements in cryogenic through-the-tool machining operations. What drove the cryo-advantage home was the massive aerospace pylon demonstrating both the volume and the ability to affordably machine the hard materials commonly associated with design requirements for highly-stressed, critical components for aerospace and the oil and gas industry. The ability to quickly machine hard metals accurately with a non-toxic, environmentally friendly "coolant" (liquid nitrogen) was the basis of the cryogenic manufacturing advantage.

Traditional manufacturing was not without its stand-outs and a few of the key developments were found within tooling and workholding. First, mPower demonstrated its hollow, modular tombstone solution that reduces setup time and bruised fingers by providing a tongue-and-groove indexing feature to remove / replace fixturing plates; whether in a horizontal or vertical configuration. This was complemented by the SpeedLoc precision mounting/fixturing system that accommodates robotic interoperability for a more automated application. XEBEC exhibited a solid ceramic bristle solution for deburring and polishing. This approach provides a more robust and controlled process over fiber offerings. A pleasant surprise was to find Closed Loop Recycling with a recovery, recycling solution that uses a polypropylene mat to collect everything from water to lubricants. With a dry cleaning process, these constituent liquids are removed and isolated and the mat...reused! The company will even come out to talk about the design layout and help provide the installation.

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