This is the second edition of the ISA Smart Manufacturing & IIoT Division (SMIIoT) newsletter and I hope you will enjoy the reading.

1) Welcome to our Division

Great to interact with all of you again!

On April 29th we had first meeting of division members where we presented our plans and goals to all of you. I am happy to inform that we are on track with planned activities and most notable achievement is creation of 8 Technical Subcommittees that will focus on specific areas. I would like to thank all the members who showed interest and agreed to contribute to these subcommittees. Our ultimate goal is to become an influencer in SM and IIoT world. These TS are a small step towards that.

We are always open to receiving ideas and feedback from our members. Drop a line anytime to me or any of division board members.

ISA Elections results are just out. I had sent couple of emails to you with voting appeal. Big thank you to all division members who voted. This year voting % was ~10%, a big jump from last years 4%!

I would like to congratulate all elected leaders! Special Congratulations to Carlos Mandolesi for being elected as President Elect Secretary for 2021. Carlos is co-founder of SMIIoT division and a key member of our team. Carlos, we are very proud of you!!

Election Results:

President-elect Secretary (2022 President)
- Carlos Mandolesi
Treasurer
- Scott Reynolds
Executive Board Members
- Ken Belteau
- Jim Garrison
- Rajesh Rathi
- Prabhu Soundararajan
- Ashley Weckwerth
Automation and Technology Vice President
- Edward Naranjo
Image & Membership Vice President-elect
- Jon DiPietro
Standards & Practices Vice President-elect
- David Lee

Take care, Stay SAFE & Stay HEALTHY!

Sujata Tilak
Division Director
Division Board Members:

Meet SMIoT Division Board members:

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Country</th>
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<tbody>
<tr>
<td>Director</td>
<td>Sujata Tilak</td>
<td>India</td>
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<tr>
<td>Program Chair</td>
<td>Mayur Mehta</td>
<td>India</td>
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<tr>
<td>Program Chair</td>
<td>Jeff Winter</td>
<td>USA</td>
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<tr>
<td>Education Chair</td>
<td>Ricardo Diogo</td>
<td>Brazil</td>
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<tr>
<td>Membership Chair</td>
<td>Marc Ayala</td>
<td>USA</td>
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<tr>
<td>Newsletter Editor</td>
<td>Carlos Mandolesi</td>
<td>Brazil</td>
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<tr>
<td>Webmaster</td>
<td>Erik Maran</td>
<td>Brazil</td>
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<tr>
<td>Marketing Chair</td>
<td>Victor Venâncio</td>
<td>Brazil</td>
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<tr>
<td>Section-Division Liaison</td>
<td>Carlos Mandolesi</td>
<td>Brazil</td>
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<tr>
<td>Board Member</td>
<td>Karam Rehani</td>
<td>India</td>
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<td>Board Member</td>
<td>Dharmender Singhal</td>
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<td>Board Member</td>
<td>Dattatray Sawant</td>
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<tr>
<td>Board Member</td>
<td>Juan Ferrer</td>
<td>Spain</td>
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2) ISA Virtual Events

a) Virtual IIoT & Smart Manufacturing Conference

27 October

Conference Topics:

- Navigating the IIoT Landscape
- System Design & Architecture
- Cybersecurity & Safety
- Implementation & Management
- Smart Manufacturing
- Digital Transformation

b) Webinars

Webinar with Microsoft

Leading the Energy Transition: People-Driven Value, Sustainability & Culture of Innovation

23 July | 1 pm – 2 pm ET

Registration
3) Division Activities

a) Division member virtual meeting

The Division conducted its first member virtual meeting with more than 70 members online. We discussed the activities planned for the next months and announced the creation of the Technical Committees.

b) Launch of Technical Committees

Following our plan, the Division is launching a series of Technical Committees. These committees will be the life blood of the division and play a huge part in helping to shape the value of our division for our members and to the industry at large. Knowing our committees were selected based off the hottest trends in the industry, we have no doubt that you will be able to make a big impact. We look forward to working with each of you and seeing what you will be able to accomplish.

We were excited to see such a high turnout of interest in our committees after just the first meeting. We had more people than slots available and some categories had significantly more interest than others. As a result, the selection process for who is best suited for each subcommittee was a tough one. As part of our selection process, we based our decisions on original interest feedback from the Division Launch Webinar, survey responses, and familiarity with the candidates.

We’re launching the following Technical Committees:

<table>
<thead>
<tr>
<th>Committee</th>
<th>Leaders</th>
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<tbody>
<tr>
<td>Cloud Technologies</td>
<td>Nagaraj GP</td>
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<tr>
<td>Artificial Intelligence (AI) &amp; Machine Learning (ML)</td>
<td>Dharmender Singhal</td>
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<tr>
<td>Digital Twin &amp; Simulation</td>
<td>Sam Russem</td>
</tr>
<tr>
<td>Virtualization technologies (VR and AR)</td>
<td>Jagdish Shukla</td>
</tr>
<tr>
<td>Cyber Physical Systems</td>
<td>A. V. Rajabahadur</td>
</tr>
<tr>
<td>Communication and Networking (Industrial Internet)</td>
<td>Ranjithkumar M</td>
</tr>
<tr>
<td>Industrial Internet of Things (IIoT)</td>
<td>Shiv Kataria &amp; Oscar Amaury</td>
</tr>
<tr>
<td>Cybersecurity</td>
<td>Jacob Chapman</td>
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4) Technical Articles:

a) How automation professionals are fighting COVID19?

COVID-19 has created an unprecedented global need for ventilator machines. As medical suppliers scramble to prevent shortages, other companies are stepping in to do what they can. Automation professionals around the world are going above and beyond to help fight the spread of COVID-19. ISA conducted a 2-part interview with Kash Behdinan, president of Pointfar Automation and ISA member, on his company’s digital twin model for ventilator manufacturing:

Read Part 1  Read Part 2

b) An Emerging Role for IoT in the Health Care Delivery System

By Rajabahadur V. Arcot (SMIIoT Division Member)

COVID-19 crisis has triggered a debate about the present health care delivery system. This article describes how the Internet of Things (IoT) has the potential to become a game changer. It can help clinicians provide health care services from remote locations and, if the situation warrants, shift from patient-centered care to community-centered care.

The World Health Organization recently issued an interim guidance called “Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts” that says, “as hospitalization may not be possible because of the burden on the health care system,” patients “with mild illness and no risk factors may need to be isolated in non-traditional facilities, such as repurposed hotels ...or managed at home.” It goes on to state that “a communication link with health care provider or public health personnel, or both, should be established for the duration of the home care period.”

Remote patient monitoring (RPM) systems gather patients’ physiological parameters and transmit the data to health care providers. RPM can serve as this WHO-
recommended communication link—and at the core of RPM is IoT. Remotely managed health care can lead to more efficient use of resources and the safety of patients and clinicians, limiting the spread of infections like COVID-19.

COVID-19 Poses Challenges to the Health Care System

As yet, there are no specific medicines or vaccines for this highly contagious disease. The present approach of the health care system, focused on patients and hospitals, is under severe stress. There are not enough health care professionals. There are not enough hospital beds, mechanical ventilators, or oxygen cylinders—even in developed countries like Italy, Spain, the U.K., and the U.S. There is a shortage of intensive care units and high-dependency beds in hospitals required to treat the large number of COVID-19 patients who are queuing up for admission in large numbers.

This hinders the treatment of other patients requiring hospital care, jeopardizing their safety as well. In addition to these systemic issues, health care professionals themselves are under intense pressure. There are also worrisome reports about the transmission of the disease to health care professionals from COVID-19 patients under treatment, with some workers even succumbing to it themselves. The number of such cases is on the increase.

Based on their personal experience, Dr. Mirco Nacoti and his colleagues of Papa Giovanni XXIII Hospital in the province of Bergamo, the epicenter of the COVID-19 outbreak in Italy, recommended a home care approach for COVID-19 patients with mild symptoms in a recent article. The article argues that, under pandemic conditions, patient-centered and hospital-centered care “is inadequate and must be replaced by community-centered care. Solutions for COVID-19 are required for the entire population, not only for hospitals.”

The article goes on to elaborate that, lacking a sufficient staff and necessary equipment, overwhelmed by large number of patients to be attended, health care professionals are not able to give pandemic patients the necessary attention. Palliative care and hospitals are not able to maintain the expected standard of care. Doctors are often forced to choose between attending to pandemic patients and delivering regular services to other patients, such as child delivery.

Hospitals likely also facilitate virus transmission to other uninfected patients, contributing to the spread of the disease as ambulances and personnel rapidly become carriers of the virus. Front line medical staff can also become victims to COVID-19. According to the article, such disasters could be “averted only by massive deployment of outreach services.” This approach would limit hospitalization to a focused target based on disease severity, thereby decreasing contagion, protecting patients and health care workers, and minimizing the use of protective equipment.

Home Care with a Surveillance System Has Its Advantages

To provide sufficient health care support to COVID-19 patients and to slow down the spread of the virus, the medical community needs tools to obtain patients’ disease information. This data can help them decide on the course of treatment and to learn more about the disease itself.

Using clinical-grade sensors (often referred to as biosensors or biometric sensors) that are connected to RPM systems, it is possible to gather patients’ physiological parameters and analyze them. RPM is akin to PC-based data acquisition systems that are typically used in industrial applications. IoT is at the core of RPMs now being engineered and built, just as it plays an important role in industrial automation systems. The sensors used for measuring physiological parameters, such as the body temperature, heart rate, and blood pressure, are typically non-invasive, however—unlike the commonly used sensors in industrial automation applications.

Biosensors and biomedical sensors often come in the form of wearables or patches. They have built-in transducers that convert sensor outputs into electrical signals and transmit them from the patient’s location to the monitoring systems at the health care provider’s location for assessment and recommendations. Biosensors and biomedical sensors are the equivalent of multivariable transmitters used in industrial process plant applications.

With the help of analytical software, the patients’ historical physiological parametric data can be analyzed to detect or predict improvement or deterioration. At the individual level, such analysis helps health care professionals understand when to initiate appropriate remedial actions. At the collective level, analysis helps better understand the disease itself. RPM allows the data to be compiled, stored, and distributed in a structured and clinically relevant format, thus making better interpretation possible.

RPM and IoT Facilitate Remote Health Care

RPM systems built around IoT and wireless communication technologies such as Wi-Fi and Bluetooth—with their processing and connectivity capabilities—are emerging as potential solutions that will allow patients to stay in their homes while receiving the appropriate treatment. With the help of these RPMs, clinicians can direct treatment from remote locations. Even in the case of hospitalized patients, these systems will minimize the need for personal doctor visits to the
patients’ beds and decrease the likelihood of spreading the infection.

Health care providers and authorities have found an ally in RPM typically built around IoT. Health care authorities, such as the Centers for Medicare & Medicaid Services of the U.S. Department of Health and Human Services, have recognized the situation. To respond effectively to the serious public health threats posed by the spread of the COVID–19, they have issued notifications that permit physicians and other health care practitioners to furnish services using remote communications technology to avoid exposure risks to themselves, their patients, and the community. The writing is on the wall—as the synonym of remote communications technology in the health care sector, IoT is headed for extensive use in the future. IoT offers a way out of some of the challenges of the health care industry and may prove to be a game changer.

**About the Author**
Rajabahadur V. Arcot is a life member of ISA, a member of ISA's Smart Manufacturing & IIoT Division, and an ISA-accredited mentor and trainer. He authors industry and technology trend articles, market research reports, case studies, and white papers, providing insights into automation and manufacturing IT.

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c) The Future of Automation: Will Robots Take Your Job?
By Chris Sciulli

When you hear the word “Automation”, what comes to mind? The answer most likely depends on your familiarity with our industry. To many people outside the automation industry, the first thought that might pop up is:

"Will my job be replaced by a robot?"

The concern is valid for a lot of people all over the world. If we’re being honest, there is no simple answer.

**About the Author:**
Chris is the digital marketing lead for ISA and specializes in content marketing, social media marketing, and SEO.

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d) Business transformation through digitalization - Technology, culture, and processes are all essential to success
By Victor Venâncio (SMIIoT Division member)

Oil and gas businesses around the globe are undergoing a broad range of transformations these days, pushed by nations needing to meet the United Nations’ 2030 Agenda for Sustainable Development, by the availability of new digital technologies, by the use of renewable energy, and by changes in consumer behaviors.

Energy industry drivers of change known as the “four Ds”:
- digitalization,
- decentralization,
- democratization,
- and decarbonization

are boosting the adoption of new technologies and challenging the business models that the industry has been built upon. We are also globally experiencing a moment of major change accelerated by the effects of the COVID-19 pandemic, with transformation equally impacting organizations and individuals.

The digital transformation journey of any business is a period of organizational turbulence even in the best of global conditions. It is a time of information technology (IT) and operational technology (OT) convergence. It is when professionals with different skills should align their efforts toward overcoming challenges and delivering the elements of value that are important for clients and other stakeholders. The idea is understood differently depending on the department or a professional’s background but, for industrial companies, transformation encompasses three pillars: technology, organizational and geographical culture, and processes.

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Click here to read the full article
These three pillars are always immersed in a huge amount of structured or unstructured data, originating from several sources internal and external to the company. That data is the “digital” portion of the transformation journey. And the purpose of the journey is to answer a series of questions.

Are organizations prepared to ensure the sustainability of their businesses with the agility and responsiveness required at this moment? Are they prepared to move fast enough to build a solid bridge between strategy and execution? Can they link the company’s vision to the values that they will actually deliver to their clients?

Can leadership’s primary focus change from return on investment (ROI) to customer value, or from operational costs and efficiency to agility and adaptability? What percentage of budget is allocated to business as usual (BAU) activities, and what percentage is actually allocated to initiatives that will leverage digital transformation strategies?

Some paradigms of traditional management must shift so that transformation can actually occur. And this is no easy task.

This article discusses how the three pillars of digital transformation correlate with each other and highlights issues that organizations must be careful about:

- The technology pillar
- The cultural pillar
- The processes pillar

Examples are specific to the oil and gas (O&G) industry, but the discussion applies to many other market segments as well.

About the Author
Victor Venâncio is partner director for automation, Industry 4.0 & digital transformation for the Energy and Natural Resources group within KPMG Brazil. He has more than 25 years of experience in automation, instrumentation, and business for the oil and gas and energy industry. He is also ISA chair of ISA’s newest technical division, Smart Manufacturing and IIoT, and strategic partnerships director for the ISA Rio de Janeiro chapter (Brazil).

This article was published at Intech Magazine 2020/Jan-Feb edition.
of IIoT sensors and systems. At a Consumer Electronics Show (CES), many companies demonstrated attempts to deploy IIoT in industrial facilities—often with woefully inadequate performance and cybersecurity. The rush to develop and deploy will no doubt increase consumer IoT being used for IIoT, accelerating the IoT and IIoT convergence.

However, we must take heed when it comes to cybersecurity and realize that with commercial IoT, an industrial target could be attacked in a manner similar to an attack on a commercial target—but with very different consequences. The solution? Although we should accept that IoT and IIoT will converge, there must be clear distinctions in cyber architecture and associated protections. This goes for implementation as well as regulations and guidelines proposed by governments and industry standards developed by organizations like ISA.

About the Authors:

Peter Fuhr, PhD, is a distinguished scientist at Oak Ridge National Laboratory and also serves as the technology director for the Unmanned Aerial Systems (UAS) Research Laboratory. He is the director of the ISA Test & Measurement Division.

Marissa Morales-Rodriguez, PhD, is a research and development scientist at Oak Ridge National Laboratory. She has been working in the area of chemical sciences, concentrating on applications related to sensing, additive manufacturing, and document security. She is director-elect of the ISA Test & Measurement Division.

Sterling Rooke, PhD, is the founder of X8 LLC, a technology company focused on industrial sensors with an eye toward cyber- and energy security. On a part-time basis, Rooke is the director of training within a Cyber Operations Squadron in the U.S. Air Force. In his role as a reserve military officer, Rooke leads airman through training exercises to prepare for future conflicts in cyberspace. He is the director-elect of the ISA Communication Division.

Penny Chen, PhD, is a senior principal technology strategist at Yokogawa US Technology Center (USTC), responsible for technology strategy and standardization focusing on wireless, networking, and related security, and exploring new technologies for industrial applications. Chen is actively involved in ISA100, Wireless Systems for Automation, and a variety of IoT standardization activities, including IEEE P2413 IoT Architecture Reference Framework. Chen received a PhD in electrical engineering from Northwestern University.

A version of this article also was published at InTech magazine.

5) Recommended ISA Book:

Driving Business Value in Industrial Innovation: Disciplined Agility for Manufacturing Automation

By Augustine Tibazarwa

Click here to read the full article

Book introduction prepared by the author:

There is a manufacturing renaissance, powered by emerging Smart Manufacturing technology, catalyzed by Industry 4.0, and reinforced by perception that the industry is regaining its innovative edge. At the heart of manufacturing technology are process automation systems that are foundational enablers for managing and controlling the operating cost of manufacturing assets, the consumption of raw materials and energy, and the presence of unsafe conditions. For manufacturers, Digital Transformation means unlocking business value in operations and ensuring safer plants for brownfield facilities, optimizing engineering and commissioning for greenfield facilities, and accelerating continual integration for Private Equity acquisitions. Automation suppliers must consider agility as basis for competitive innovation to deliver business solutions and technology at pace and scale for manufacturing business transformation, and to address safety and security threats.

The emerging frontier of industrial innovation points at exciting changes revolutionizing the business of manufacturing. For automation suppliers, there are significant new value opportunities with plant digital twin, IoT (Internet of Things), and safety incidents elimination. Opportunities have disruptive potential for incumbent automation suppliers and could spawn new corporate users of automation platforms, extend the value of automation to other corporate activities such as M&A, transform legacy business models, and create more recession-proof revenue streams.

As ISA marks its 75th Anniversary, the ISA community has a pivotal role in shaping industrial Digital Transformation. When it comes to convergence, in real-time, of physical and digital worlds, ISA thought
leadership and standards are indispensable resources for Smart Manufacturing as ISA members are called upon to innovate faster and for new business value.

Meet the Author:

Augustine Tibazarwa is Director of Software Development at PTC (an IoT technology company). He has more than 15 years of professional experience in R&D management (global innovation teams) and in industrial technology development (embedded systems and software).

Tibazarwa began his career at Dow Chemical developing process automation and safety systems for world-scale manufacturing. He worked at Invensys (now Schneider Electric) in manufacturing automation systems R&D, and at Deloitte Consulting as a management consultant (Strategy & Operations) for product development and supply chain management.

Tibazarwa has published a paper on “Distortion of Process Values by N-multiplet Reconciliation.” He is a co-inventor of the patented Integrated Control & Safety system. He gained a Bachelor of Arts degree in physics, a Master of Science degree in computer science, and a Master of Science degree in engineering management (MIT Sloan School of Management).

ISA 75th Anniversary

This year, ISA celebrates 75 years.

Visit our Division website:
https://www.isa.org/iiot-and-smart-manufacturing-division/

Join our LinkedIn Group:
https://www.linkedin.com/groups/12175409/

How to become a Division Member?
If you would like to add this division to your ISA Membership at no additional charge, please info@isa.org. Please invite your colleagues to join.

Want to talk with us or submit an article?
Just send an e-mail to isa.smiiotdiv@gmail.com and we will return to you ASAP.

Visit the 75th ISA Website