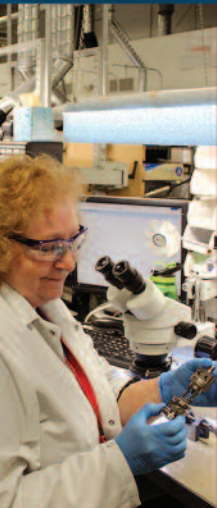


Here IS HOW

WE ACCELERATE EXCELLENCE



2018 - 19 ANNUAL REPORT



University at Buffalo
The Center for Industrial
Effectiveness (TCIE)

Our Mission

The University at Buffalo (UB) Center for Industrial Effectiveness (TCIE) leverages assets of the UB School of Engineering and Applied Sciences (SEAS) to improve the operations of external business and industry partners, and meet critical and emerging workforce needs. We spark excellence in people, processes and technology to help you start, grow and sustain your business. Our team resolves a wide spectrum of corporate challenges through technical assistance, continuous improvement and professional education.

Our Values

Integrity

We build our reputation by being accountable, credible, ethical and respectful.

Service

We effectively engage partners and drive outcomes by being responsive, adding value, and facilitating collaborations.

Excellence

We exceed stakeholder expectations by achieving results, demonstrating initiative, leveraging our resources and expertise, and insisting on sustainable improvements.

Innovation

We foster a culture of creativity by embracing change, risk-taking, lifelong learning and a supportive environment.



A Year in Review

When did you first become aware of “Industry 4.0”?

I cannot recall the exact moment, but I do know its significance skyrocketed in 2015. That’s when the University at Buffalo signed on as an academic member for a Manufacturing USA entity, aimed at transforming American manufacturing by connecting systems and data to produce more efficient business decisions.

Soon thereafter, Industry 4.0 and its affiliated jargon became part of UB TCIE’s language. Our responsibility in supporting this new partnership was to advocate the so-called fourth era of manufacturing to the masses. Our immediate task was to manage the development of 10 online courses.

Four years later and words like Internet of Things (IoT), machine learning and artificial intelligence are ubiquitous.

Such terms, once relegated to the manufacturing sphere, are creeping into other industries.

The trickle is infiltrating local companies. We know – through our perpetual efforts to capture the voice of industry – that there is intrigue about big data, blockchain, machine learning and other areas of the high-tech boom.

Talk is one thing. Action is quite another.

Interactions with our clients and the Western New York business community clearly reveal that obstacles temper our region’s rate to adopt state-of-the-art technologies.

Surely, there are many companies embracing these digital gifts of the 21st century. Yet numerous barriers make it a tough road at the least, and may trigger an aversion effect at worst.

Ditching legacy systems in favor of the smarter variety is often unaffordable and impractical.

Some companies lack the required technical expertise. Interoperability challenges burden others. Concerns over cybersecurity compound the issue for everyone. And deciphering relevancy of Industry 4.0 concepts and tools, alone, can be cumbersome.

Those with means to assist in bridging these gaps – state and national agencies – notice the struggles.

They recognize the critical role that small and medium-sized businesses play in the supply chain, and the new resources they need to remain competitive. Funding opportunities targeted at resolving the accessibility problem and ensuring necessary infrastructure are multiplying.

We want to contribute to the solution.

Our center is working with partners from within and outside of UB to identify and pursue grants that harness our research, education and consultation services. We are also bringing companies to the table in discussions about innovative advancements with agencies, research institutions and other resources.

UB TCIE can also help on a smaller, personalized scale.

Unsure how IoT is relevant to your organization? Cognizant of how AI can improve your product or service, but struggling to integrate? Give us a call for answers and assistance.

Of course, we are always here to serve your non-Industry 4.0 business needs, too.

Timothy Leyh

Executive Director, The Center for Industrial Effectiveness (TCIE),
School of Engineering and Applied Sciences, University at Buffalo



UB School of Engineering and Applied Sciences (SEAS)

UB is a premier research intensive public university and a flagship institution in the 64 campus SUNY system. SEAS is the largest and most comprehensive public school of engineering in New York. Annual research expenditures are \$74 million.

The engineering departments are: Biomedical; Chemical and Biological; Civil, Structural and Environmental; Computer Science; Electrical; Engineering Education; Industrial and Systems; Materials Design and Innovation; and Mechanical and Aerospace.

Performance Measures

UB TCIE annually assists hundreds of public and private organizations in enhancing and sustaining their strategy and execution. The following performance measures provide a glimpse into our achievements during this past fiscal year.

33

Markets Served

52

Undergraduate/
Graduate
Students Placed

232

Continuous
Improvement
Projects

306

Industry
Partners
Served

14,119

People Trained/Certified
Includes distance learners

\$2,401,243

in Total Revenue

A Few Members of Our Team



Peter Baumgartner
Operational Excellence Director



Don Bowes
Senior Consultant/Facilitator



Akshay Sivadas
Project Engineer



Julie Stiles
Senior Consultant/Facilitator

“People Inc. continues to partner with UB TCIE because of the impact we see on our organization. It’s great to see staff from across the agency working on teams to address priority issues that they are passionate about. Progress and results are tracked, and new skills are carried over to future projects.”

– Rhonda Frederick,
President and CEO, People Inc.

Strategic Partnership for Industrial Resurgence (SPIR)

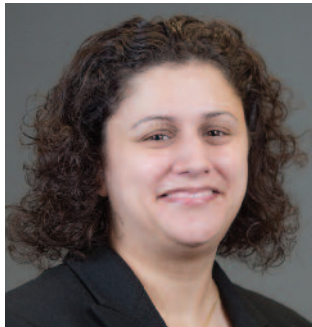
Grant funding from New York State's SPIR program subsidizes access to technical assistance, helping businesses foster breakthroughs with technological advances so they can lift their market share, create jobs and grow their business.

A program of SUNY, it supports development of new technologies with engineering resources from the Buffalo, Binghamton, Albany and Stony Brook campuses. As regional administrator for Buffalo, we provide industry partners with matching funds of up to \$25,000 for UB engineering assistance.

SPIR Engineering Faculty Roster



Jason Armstrong
Associate Professor
of Teaching, Department
of Mechanical and
Aerospace Engineering



Sabrina Casucci
Director, Engineering
Management Program



Varun Chandola
Assistant Professor,
Department of Computer
Science and Engineering

"UB TCIE was very flexible to our needs. We needed to have something done to save time and money. It worked out well. I'm glad they were there."

Dave Woolley, president, L.A. Woolley Electric, Inc.



David Doermann
Director, Artificial
Intelligence Institute



Brad Darrall
Assistant Professor
of Teaching, Department
of Mechanical and
Aerospace Engineering



Li Lin
Professor, Department
of Industrial and Systems
Engineering



Shambhu Upadhyaya
Associate Dean for Research
and Graduate Education,
SEAS

Metrics highlighting the impact of SPIR-subsidized projects in FY 2018-19

45
SPIR
Projects

189
Industry
Partner Jobs
Created*

2,649
Industry
Partner Jobs
Retained*

\$35,670,000
in Industry
Partner Increased
Revenue*

* Projections based on industry partner reporting

Professional Education

From short workshops to in-depth certification courses, UB TCIE educates professionals about business-trusted operational excellence practices and emerging technologies. Traditional, blended and online courses are available through open enrollment classes or corporate contracts that bring programs to a company location.

Number of training events

67

Number of industry partners represented by participants

123

Number of people trained/certified in continuous improvement courses

773

COURSES OFFERED IN 2018-19

		CONTINUOUS IMPROVEMENT TOOL	TRADITIONAL	BLENDED	ONLINE
1	3-Day AS9100 Internal Auditor Training	ISO	■		
2	3-Day ISO 13485 Internal Auditor Training	ISO	■		
3	3-Day ISO 9001:2015 Internal Auditor Training	ISO	■		
4	5S and Standardized Work	Lean	■		
5	Black Belt Blended Learning (BBBL)	Six Sigma		■	
6	Black Belt One-on-One (BBO)	Six Sigma			■
7	Certified Lean Professional (CLP)	Lean	■		
8	Certified Production Technician (CPT)	Manufacturing Operations			■
9	DoE Training	Six Sigma	■		
10	Finance for Non-Financial Managers	Operational Excellence	■		
11	Green Belt Blended Learning (GBBL)	Six Sigma		■	
12	Green Belt One-on-One (GBO)	Six Sigma			■
13	Intro to FMEA	Six Sigma	■		
14	Introduction to Document Control	ISO	■		
15	Introduction to Lean Six Sigma	Operational Excellence	■		
16	ISO 13485:2016 Transition Training	ISO	■		
17	ISO 21CFR820 Overview	ISO	■		
18	Kaizen and VSM	Lean	■		
19	Kaizen II	Lean	■		
20	Lean Boot Camp	Lean	■		
21	Lean Overview I	Lean	■		
22	Lean Product Design	Lean	■		
23	Minitab Training	Six Sigma	■		
24	Metallurgy for the Non-Metallurgist Training	Manufacturing Operations	■		
25	Root Cause Analysis and Corrective Action	Operational Excellence	■		
26	Visualizing Data	Operational Excellence	■		
27	What Is Operational Excellence?	Operational Excellence	■		

Evolving Digital Education

UB TCIE entered the new digital education landscape a few years ago and continues to invest because of changing expectations.

Learners are busy. Some want to consume education in small chunks. Others prefer to binge watch. Many seek alternative outlets for lifelong learning opportunities that come with the incentive of a credential.

Below is a peek into how our efforts elevated the online stature of UB TCIE, SEAS and SUNY in FY 2018-19.



More Massive Open Online Courses (MOOCs)

We expanded our assortment of MOOCs, which are a collection of 5- to 10-minute video lesson learning sprints supplemented by elements such as readings, online labs and assignments.

Our first set of MOOCs were about digital manufacturing and design, and we followed up with a series on blockchain technology. The new batch that debuted in FY 2018-19 includes:

- Four courses about energy production, distribution and safety (in coordination with SUNY Buffalo State)
- One course about collaborative robot safety
- Four courses about computer vision

Worldwide MOOC enrollments:
77,553

Worldwide MOOC certificates awarded:
13,315



Establishing a pathway to credit

UB does not traditionally recognize MOOCs as an official learning experience. But that's changing.

UB TCIE worked with the SEAS Office of Digital and Online Education and Empire State College to pilot a "MOOC for Credit" process, whereby learners may receive academic credit for successfully completing select MOOCs.

A faculty-led team devised a framework for determining if successful completion of a global online course – the blockchain series in the pilot project's case – can merit academic credit.

Policy details are being finalized. The aim is to implement and replicate this model throughout SUNY.

Refining the creation process

UB TCIE collaborated with UB's Center for Educational Innovation (CEI) to ease the process for any faculty interested in creating MOOCs.

First, CEI guides faculty in the "art of teaching and the science of learning" by providing instructional design assistance. The faculty member is then referred to UB TCIE for assistance with generating the syllabus and script, video production, editing, and publishing MOOCs. Services are not exclusive to SEAS faculty, but open to the entire campus.





University at Buffalo

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