Thursday, October 1

**TRACK: LLS Applications - Healthcare**
9:15 – 10 a.m.

*Navicent Health Emergency Center Blood Culture Contamination Rate Reduction*
# 158 (B) Industry
Paul Barkley, Navicent Health

Objectives:
Learning objectives of this Emergency Center Blood Culture Contamination presentation include methods to reduce contamination, maintenance of those gains, as well as utilization of these specific tools:

- Benefits of product and process standardization with specimen collection, with intent of reducing contamination factors.
- Hidden factors and previously unknown barriers identified through Cause and Effect Analysis.
- SIPOC – Lessons learned in identifying all components, especially in the discovery of customers and their changing needs in a dynamic and ever evolving healthcare environment.
- Opportunities for improving existing physical layout to reduce motion, transport and shrink turnaround times.

The Six Sigma DMAIC process was employed in the Navicent Health Emergency Department to reduce blood culture contamination and improve resource utilization. A period of 12 months preceding project formation was evaluated in comparison with a five-month period following project implementation. The project has resulted in a reduction of contamination by 2.7 percent, which has translated into an average of 30 fewer contaminants per month.

The reduction in contamination has yielded time and financial savings through the avoidance of unnecessary specimen recollection, antibiotic therapy, unintended therapy consequences and increased patient length of stay. A conservative estimate of $2,000 per episode has been applied as a measure of cost avoidance, resulting in at least $300,000 in savings since project inception.

Several additional project gains were realized to include development of a standardized collection kit to eliminate supply variation, improved collection site identification, as well as decreased transport, dwell and turnaround times.
**TRACK: LSS Research - Industry**

9:15 – 10 a.m.

*Leading Lean*

# 159 (All) Industry

Crystal Davis, The Lean Coach Inc.

Objectives:

Attendees will learn my lessons for effectively and successfully getting leadership and management to not only buy-in to Lean Six Sigma transformations, but lead them.

Attendees will:

- Learn the importance and methods to become influencers of Lean Six Sigma in their organization.
- Understand their role beyond mastering and teaching the tools.
- Learn the importance of competencies in business and financial acumen related to Lean Six Sigma’s value proposition.

Many articles and papers discuss the leading failure mode of Lean Six Sigma implementations is lack of leadership buy-in. In this presentation, the attendee will learn proven methods and guiding principles to become the key influencer to get leaders and managers engaged in process improvement transformation.

The Lean Six Sigma expert often mistakes their role and responsibility in facilitating the methodology in the organization. Learn how it may just be your fault leaders don't buy-in.

Practitioners often forget the methodology is a language in and of itself. It is important to speak Lean Six Sigma in the business language leaders and managers understand.

And finally, practitioners are passionate about the tools and techniques, which often overshadow the true value proposition of the methodology. This presentation will provided lessons and methods to overcome all of these challenges and position the expert to guide leaders to their rightful place of Leading Lean.

**TRACK: LSS Education**

9:15 – 10 a.m.

*Hands-on Lean Six Sigma Learning, in a “Hands-off” Service Industry*

# 165 (I) Industry

Aaron Spearin, E6S Industries, LLC

Objectives:

- Experiential games demonstrate the practical execution of Lean Six Sigma tools in a more realistic, “not-so-perfect” scenario, which offers greater learning than a theoretical execution within a perfect scenario.
- Many of the hands-on Lean Six Sigma simulations used to teach in a manufacturing setting do not translate well to the service industry.
- Service-based simulations have been demonstrated well to teach Value-Stream Mapping, Statistical Process Control, Root Cause Analysis, Design of Experiments, Inferential Statistics, Design Thinking, etc.
• An instructor’s own creativity and experience can be used to turn a dry, boring lecture into a fun and powerful learning experience. Simulation packages are also available for purchase or for free in a variety of formats.

This presentation demonstrates the use of experiential learning games in the Lean Six Sigma training environment for the service industry. Specific examples will be shared to show how experiential learning is leveraged to teach topics like Value-Stream Mapping, Statistical Process Control, Measurement System Analysis, Root Cause Analysis, Design of Experiments, Inferential Statistics, Design Thinking, etc. With each example, some pros and cons will be discussed, as well as specific tips to turn a “not-so-perfect” demonstration into a good lesson about reality of executing a Lean Six Sigma tool in the “not-so-perfect” real world.

**TRACK: Case Studies**

9:15 – 9:35 a.m.

**Improving the Teaching of a Lean Construction System Using Gemba Walks: A Case Study**

# 157 (I) Academic

Bolivar Senior, Colorado State University and Brad Hyatt, California State University

**Objectives:**

- Application of gemba walks in a higher education context.
- Improved awareness of the differences between professional training and educating undergraduate students.
- In-depth discussion of the hands-on labs addressing lean Construction’s Last Planner System

A key insight of Lean Management is that the best way to understand a problem and develop a solution is by going in person to the place where the action is taking place. Using Lean Management terms, nothing replaces the importance of going to gemba. This presentation discusses how going to gemba helped in the detection and solution of problems encountered by one of the authors while implementing a new, hands-on approach to introduce the Last Planner System, key to Lean Construction, to undergraduate students in a Construction Management program. The presentation discusses the challenges intrinsic to teaching the Last Planner System to undergraduate students, the semester-long laboratory sessions to teach the technique, and the breakthrough role of gemba walks in solving the problems encountered when productivity levels in the labs did not seem to be improved by the Last Planner System. The presentation concludes with a summary of lessons learned and recommendations for lean educators attempting the introduction of innovative teaching methods in higher education.

9:40 – 10 a.m.

**The Lean-green Supply Chain Performance Measurement**

# 160 (I) Academic

Roya Kalbassi, Concordia University

**Objectives:**

- The study provides an empirical insight into organizational performance enhancement using lean-green techniques.
- The parallel implementation of both lean and green techniques is investigated.
- The relationship between implementation of the lean-green techniques and performance outcome of the organizations is analyzed and described in detail.
- The study is based on a large-scale survey among more than 200 Canadian companies.
Organizational performance enhancement is one of the main concerns of companies in the competitive market nowadays. Recently, lean and green manufacturing practices are being introduced as the essential elements of performance improvement and enormous academic and industrial researches are focusing on the establishment and integration of these concepts. However, parallel implementation of lean and green manufacturing practices and its impact on organizational performance is rarely studied in the previous works. In this research the effect of this phenomenon on the production quality, customer satisfaction and overall performance of the organization is investigated by performing a large-scale survey. Statistical analysis is conducted in order to interpret the collected data from more than 200 companies in aerospace supply chain in Canada. Moreover, the study provides an empirical insight into the advantages of having a hybrid supply chain management system which consist of both lean and green methods. Preliminary researches provide the relationship between the lean-green practices and the performance outcomes which vary in terms of statistical significance and correlation strengths.

**TRACK: LLS Applications - Healthcare**

10:05 – 10:50 a.m.

*‘One Point Lesson’ Tracking, Training and Gap Analysis System*

# 168 (B) Industry

Nathalie Khodr, Center for Health Care Services

Objectives:

- Learn about One Point Lessons (OPLs) and the tracking and training system.
- Learn about the use of OPLs to assess employee’s knowledge & skills gaps.
- Learn how to use OPLs within the context of LEAN initiatives.

A One Point Lesson (OPL) is a one-page informational aid that assists an employee in performing tasks more efficiently. It is a quick overview of a process step within a workflow, with the goals of optimizing operations and reducing the cost of learning.

Some benefits of an OPL are to engage front line workers, aid in the training of employees and track knowledge transfer using a simple numbering system.

Brevity is the key to an OPL. It uses short bullet point statements and visual aids allowing better knowledge transfer and more rapid cognitive assimilation. An OPL can be referenced in the task lists and job breakdowns when developing standard work. Additionally, a training matrix and gap analysis can supplement OPLs by providing a tracking mechanism for training, and knowledge and skills assessment.

The presentation will discuss practical usages of OPLs in the context of LEAN.

**TRACK: LSS Research – Industry**

10:05 – 10:25 a.m.

*Using Mobile Technology to Improve Coordination in Perioperative Services*

# 191 (I) Academic

Lawrence Fredendall, Kevin Taaffe, Joel Greenstein, Clemson University, and Nathan Hyunh and Jose Vidal, University of South Carolina
Objectives:
This presentation addresses the use of lean in a hospital’s perioperative services department in conjunction with mobile technology.
- Using coordination theory as a means of understanding lean operations.
- How improved coordination improves patient and staff safety.
- How can mobile devices be used to improve coordination in perioperative services.

Perioperative services managers in hospitals are increasingly looking at lean operations as a method to use to increase the coordination within their units. Increased coordination not only increases resource utilization, but it also improves both patient safety and staff safety. Perioperative services exist to provide coordinated delivery of complex services within a sterile environment. This requires extensive coordination of the resources (staff, equipment and material). Most staff is visually separated from each other as they prepare for the clinical procedures and delays in arrival of one or more staff or resources delays the remaining resources. Mobile technology can help institute lean operations throughout this geographically dispersed set of resources.

10:30 – 10:50 a.m.
Generating Advanced Quality Control Charts Including Multi-location Control Charts (MLCC) for Boeing Commercial Airplane Products
# 116 (I) Academic
Kamrooz Parcham Azad, State University of New York

Objectives:
- Applications of quality charts in aerospace industry.
- Advanced quality charts in aerospace industry.
- Multi-location control charts (MLCC).

Aerospace industry and aircraft manufacturing strongly rely on quality engineering. Control charts are among the most crucial tools for industrial engineers. Control charts not only assist to intensify the quality of the products and improve the processes but also provide a comprehensive guideline for quality enhancement of industries’ products and processes. While the conventional control charts shape the fundamental parts of quality control in many industries, aerospace industry and aircraft manufacturing are dominantly rely on advanced quality charts. This dependency is because of the complexity of the products and processes in aerospace industry. This presentation reviews the most advanced control charts in aerospace manufacturing and then it shows how these control charts will work in different real situations in Boeing manufacturing and assembly lines. Considering the primary assumptions for control charts and finding the best match between real situations with relevant control chart will be shown in this paper. The multi-location control charts (MLCC) will be introduced and its application in Boeing commercial airplane products will be discussed.

TRACK: LSS Education
10:05 – 10:50 a.m.
Reinventing Ourselves: Cisco’s Journey Beyond Certification
# 117 (All) Industry
Keli Holmes, Cisco
Objectives:

- An overview of Cisco’s journey to how it breathed new life into its culture through a basic tenant of lean – start with the customer.
- Insight to how Cisco’s Continuous Improvement Program used customer feedback to relaunch its training program with a renewed focus on the customer and on the development of individuals – the number one response from the business.
- Knowledge of our journey from certification-focused to strategically aligned.

We are excited to share how we are increasing the problem-solving competencies across the business by offering customizable sequences. Your business, like ours, may not need another lean or Six Sigma course. It may just need a fresh way to align today’s continuous improvement program with tomorrow’s business strategy.

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Cisco’s original Six Sigma Program focused on teaching technical aspects of Six Sigma and certifying through one-time demonstration of relevant competencies. However, approaching its tenth year, it no longer met the needs of a large portion of the company. Today, the newer, more innovative strategies being created by leadership require a dual emphasis on nimbler problem-solving competencies and the development of “softer” skills, such as team leadership and facilitation.

Please join us for an overview of Cisco’s journey to breathing new life into its culture through a basic tenant of lean – start with the customer. With a renewed focus on our customer, Cisco’s Continuous Improvement Program focuses on the development of individuals – the number one response from the business.

**TRACK: Case Studies**

10:05 – 10:25 a.m.

**Improving a Lean Office Simulation Game for Teaching Continuous Improvement**

# 178 (All) Academic
Hung-da Wan and Nihar Gupta, University of Texas at San Antonio

Objectives:

- The audience will know what lean simulation game is and the benefits of using it.
- The audience will know the problems and improvement opportunities of a selected simulation game.
- The audience will know various possible directions to improve a simulation game and learn from a case study.

Simulation game is very effective in teaching lean concepts. The gaming environment provides an active learning experience which leaves sustaining impression. Despite the effectiveness of teaching, running a simulation game is not equally trivial. The most common problem lies in the uncertain number of participants. Many simulation games require a fixed number of players. Having too many or too few players, which often happens, compromises the learning effectiveness. Another common problem is the required time: 1.5 to 2 hours in several cases. As a result, a regular 50- or 75-minute class in college is not enough for a whole round. To address the problems, this research reviews the design of an existing lean simulation game and proposes an improved version with modular design to make the game scalable in terms of time and number of players. The outcome is a leaner and equally effective process to teach lean concepts.
10:30 – 10:50 a.m.

*Lean For Social Innovation – Innovating Education via Rapid Experimentation*

# 180 (All) Academic

Wiljeana Glover, Babson College

Objectives:

- The course development process for developing an action-learning based lean course in collaboration with an outside entity and potential course partners.
- Approaches to including simulations and regular on-site visits in a course.
- Approaches to engaging nonprofit organizations as course project partners.
- The first course offering launched as a part of this initiative, including reflections and lessons learned.

The Lewis Institute at Babson College is funded by the Toyota Foundation and brings together a global, interdisciplinary community of students and mentors dedicated to building a better world. With the Lewis Institute and support from the Toyota Production System Support Center (TSSC), faculty from the Technology, Operations and Information Management Division at Babson College have developed an action-learning based course using the TPS approach and philosophy.

The approach to the course is “learning by doing,” i.e., students are assigned to a project with a nonprofit organization and are expected to implement TPS principles to make improvements in that work area. The students are on site with the partner organizations weekly and have an in-class component. During this presentation, we will discuss curriculum development (including hands-on rapid experimentation), nonprofit partner engagement, and reflections and lessons learned from the first pilot project launched as a part of this initiative.

**TRACK: LLS Applications - Healthcare**

11:05 – 11:50 a.m.

*Improve Patient Wait Time by Load-Leveling Appointments in an Academic Cancer Hospital*

# 104 (All) Industry

Miguel Lozano, UT MD Anderson Cancer Center

Objectives:

- Using data to dispel myths. The presentation will describe the efforts taken to collect wait time baseline data on multiple physicians of the clinic. The data is used to show that there is no standardization of how physicians schedule their appointments. Front-loading patients (scheduling a high number of patients in the beginning of the day) thinking that it will make the day easier for the physician does not work. Many graphs were constructed to show physicians the effect of clustering appointments on patient wait time.
- Benchmarking one of their own. One way to convince physicians of change was by benchmarking the scheduling practice of one of the physicians of the clinic. During the baseline data collection the physician and his team with the best wait time was studied and a list of 10 "best practices" was documented. Load leveling appointments by spreading them out throughout the day and identifying patients that will consume more time such as new patients and consults were the main recommendations to improve wait time. Physicians are very competitive in nature so benchmarking one of their own drove their competitive spirit from within.
• The patient assembly line. Physicians dislike analogies comparing manufacturing to healthcare but in this case we were able to calculate the "physician output rate." By collecting data during the physician clinic a rate was calculated to indicate how many patients per hour each physician can process. This rate was used then to adjust the physician scheduling templates indicating the maximum number of patients they could schedule per hour without causing excessive wait time. Physicians were shown that some manufacturing concepts can be applied directly to healthcare and illustrate valuable characteristics of their practice.

• Who is accountable for wait time? One of the main challenges of this project is that the physician team is made of different individuals (nurse, scheduler, physician assistant, business center representative) and they all have a different reporting structure in their organization. As a result it is difficult for the team to be cohesive and be accountable for all the decisions necessary to follow the best practice for scheduling. In order to sustain the changes made to the scheduling templates it is important for each team to have a clear "owner" of the schedule and hold everyone accountable. This is where all the quality tools and data fall short if there is no clear structure of roles and responsibilities of teams.

This is a continuous improvement project in the Head and Neck clinic at UT MD Anderson Cancer Center. The objective was to reduce outpatient wait time by analyzing their patient workflow and scheduling process. By applying quality tools such as benchmarking, load-leveling and standardization, wait time has been reduced by as much as 30 percent for physicians piloting the recommended changes. The recommendations are in the process of being rolled out to the rest of the H&N clinic and the hospital. This presentation is a journey of perseverance and change in a research cancer hospital environment.

**TRACK: LSS Research - Education**

11:05 – 11:50 a.m.

**Creating an Assessment Instrument to Evaluate Lean Training Programs**

# 182 (I) Academic

Sharon Johnson, Worcester Polytechnic Institute, School of Business

**Objectives:**

• A technique for evaluating lean training programs.
• A method for developing assessment instruments.
• An awareness of measures that can be used to evaluate lean programs, particularly to explore overall results and impact.
• An understanding of theoretical models and constructs that can be used to evaluate lean training programs.

Many healthcare organizations are seeking to use Lean Thinking to transform their operations, to deliver higher quality care more efficiently. Healthcare organizations typically invest in training programs, which introduce both lean philosophies and specific lean tools to employees, to support this transformation by encouraging employees to apply what they have learned to continuously improve patient care. Lean training programs often include classroom instruction with standardized content, as well as project work supported by coaching.

We present an assessment instrument developed to explore the impact of such training programs within healthcare organizations. We also discuss underlying theoretical models, including Donabedian’s structure-process-outcome framework and technology acceptance models. From a theoretical perspective, our work fills a gap by developing an
instrument grounded in validated measures from the literature. Such evaluations are also important for practice, as they can improve understanding about how training (dosage, format) and structural elements affect outcomes and success.

**TRACK: LLS Applications**

11:05 – 11:50 a.m.

*Implementing a Robust Quality & Process Improvement Transformation Program to Improve Quality and Reduce Cost*

# 101 (All) Industry
Michael O’Toole and Jennifer Lingenfelter, Piedmont Healthcare

Objectives:
- Discover how to successfully implement a Quality and Process Improvement transformation program to drive improvements in quality, service, safety, employee engagement and financial metrics at a Nonprofit Health System.
- Describe pitfalls to avoid when implementing a Quality and Process Improvement program.

Learn from a five-hospital healthcare system that recently implemented a robust Quality and Process Improvement transformation program that has delivered a significant impact on quality, service, safety and financial performance. The program was developed internally (without the use of a consultant!) by a diverse team of physicians, service coaches, patient safety and quality leaders within the organization. The program incorporates techniques from lean, Six Sigma, change management, systems thinking and human factors design.

**TRACK: Case Studies**

11:05 – 11:25 a.m.

*Creating an Inventory Storage Plan Using Lean and 5S Principles*

# 142 (B) Academic
Tamara Taylor and Jamison Kovach, University of Houston

Objectives:
- Review methods/approaches for implementing lean and 5S.
- Obtain ideas regarding the development of inventory storage plans.
- Gain insights regarding the integration of lean and 5S in inventory processes.

Inventory storage and retrieval are important functions that support most production operations. As production levels increase, so do inventory storage levels. One oil and gas equipment supplier, located in Houston, Texas, recently experienced an increased demand for their products; hence, they are currently redesigning their existing warehouse to maximize storage capacity. The purpose of this research is to assist this organization by creating an inventory storage plan for their warehouse using lean and 5S principles. As the name suggests, lean methods help reduce waste in work processes, and 5S methods helps to organize, clean and sustain a productive work environment. The storage plan developed through this work will help the organization bring material storage back on site (as recently it has been delegated to two off-site material handlers to manage/store) and reduce inefficiencies that lead to misplaced materials, excessive material movement, production delays due to waiting for materials, etc.

11:30 – 11:50 a.m.

*YouTube™ Transforms the Lean Six Sigma Classroom*
Jennifer Hooks, Medical University of South Carolina

Objectives:

- Implement a practical framework for lean education and transformation in their organization.
- Apply adult learning theory, incorporate multiple learning styles and enhance the learning experience in Lean Six Sigma education curriculum through use of videos.
- Discover innovative ways to make Lean Six Sigma training “fun” by relating improvement concepts to everyday experiences.

Beginning a Lean Six Sigma journey is challenging for any organization, especially one as complex as an academic medical center. Four years ago the Performance Improvement Department at the Medical University of South Carolina embarked down this road, and quickly realized that changing the staff’s mindset to view continuous improvement no longer as the “Flavor of the Month” but as necessary for the success of the organization would require a fundamental shift away from a traditional teaching and implementation model. The Department built a new education framework founded on adult learning theory and Edgar Dale’s Cone of Learning, and through trial-and-error and simulation discovered that structured and intentional incorporation of video clips into classes not only increased knowledge retention but also increased participant satisfaction and enjoyment. Use of videos has also allowed for better use of practical, real-world examples of Lean Six Sigma application in staff duties.

**TRACK: LLS Applications - Logistics**
1:45 – 2:30 p.m.

*Support Business Momentum by Increasing Velocity and Reducing Mass*

# 154 (B) Industry
Helmut Welke, Welke International LLC

Objectives:
The drive to become 'Lean' and reduce inbound inventory requires that the velocity of material flow movement must increase. This includes the delivery of smaller containers to the point of use more often. Attendees will learn:

- Value of small-lot deliveries.
- Off-setting the cost of more frequent deliveries.
- Smart kitting examples.
- Techniques to help change the current culture.

Do you lose business “momentum” if you reduce your raw and WIP inventory, and the ability to make any product in a timely manner without line stoppages? This presentation will look at the concepts and some examples of how material flow “velocity” supports lean manufacturing. Reducing ‘costs’ and inventory can become problems if not done in conjunction with improved planning of material movements at the lowest possible costs.

**TRACK: LLS Research – Healthcare**
1:45 – 2:30 p.m.

*Regionalizing Emergency Care with Lean/Six Sigma*

# 140 (All) Industry
Casey Bedgood, Medical Center Navicent Health
Objectives:
- Establishing collaborative agreements with competitors in order to reduce Cost of Poor Quality and regionalize standards of care.
- Designing dashboards and utilization reports to optimize system performance.
- Using Voice of the Customer to reduce Emergency Response times, improve patient outcomes, reduce Cost of Poor Quality, improve employee satisfaction, eliminate wasted motion and save green dollars.
- Optimizing the employee experience in order to maximize the patient experience, reduce costs and maximize recruitment potential.
- Using KPIs to drive system performance over large geographical areas.

The presentation is based on a Healthcare Black Belt project where a high-performance, multi-county 911 Emergency Medical Services system used lean and Six Sigma to drastically improve CTQ elements including, but not limited to: Emergency Response Times, Turnaround Times, Customer Satisfaction, Cost of Poor Quality and Wasted Motion, in addition to realizing significant cost savings and achieving overall system optimization. The project positively impacted hundreds of thousands of customers, significantly reduced operational costs, improved employee satisfaction and reduced various types of unwarranted variation.

**TRACK: LSS Education**
1:45 – 2:30 p.m.

*Utilizing Student Research as a Vehicle for Leading Lean Education*

# 179 (I) Academic
Howard McInvale, and Brandon Walker, U.S. Army - West Point

Objectives:
- Insights into utilizing student research to bring lean and Six Sigma into the classroom.
- Application of lean concepts and underlying mathematics.
- An example topic involving Kenya's Water Resources Management Authority.

Lean education provides research opportunities for students regarding innovations, techniques, and practices to improve quality and efficiency in systems. One such opportunity involves the use of directed student research in which educators assist in the application of lean thinking and underlying mathematical concepts. For example, using the crisis of water scarcity and the Water Resources Management Authority process in Kenya, this analysis investigates the use of effects-based operational methods to provide reliably optimal decision support in the context of water resource management. By examining the roles and interactions of national, regional and local levels of water management, a system-of-systems network approach is applied. Funding allocation policies are developed that leverage sector interdependence to provide reliably optimal policy recommendations. This analysis illustrates an approach to model interdependent systems, perform optimization under uncertainty and provide decision support. This presentation also offers insights into utilizing student research as a vehicle for leading lean education.

**TRACK: Case Studies**
1:45 – 2:05 p.m.

*Applying Six Sigma DMAIC Process to Improve Test Fidelity of Large USAF Space Surveillance Phased Array Radar System*
John Nicholson, University of Alabama Huntsville

Objectives:
- Six Sigma DMAIC processes can be used for a diverse set of problems— including improving operations and test fidelity on an operational radar system.
- Statistical methods can be used to characterize performance of radar systems.
- Statistical techniques can be used to high effectiveness regarding validation of operational systems.

Phased array radar performance is often difficult to characterize and validate. Often, radar performance characterization can require days or weeks to accomplish and requires the site to be non-operational while data is collected. This presentation will discuss the results of a Six Sigma project that intended to reduce the variability in the performance comparisons in order to reduce test time required and improve the accuracy of the results. The findings were significant and the performance characterization process was dramatically improved. The improved performance characterization can be accomplished in a few hours and is highly accurate. The new performance characterization identified a large performance degradation that was subsequently corrected and verified.

**TRACK: LLS Applications – Logistics**
2:35 – 2:55 p.m.

*Wayfinding in the Graduate School: Structured Problem Solving in a Non-Manufacturing Environment*
# 176 (I) Academic
Bridgid Hogan, Aihua Huang and Fazleena Badurdeen, University of Kentucky

Objectives:
- Applying lean practices in non-manufacturing environments.
- Structured problem solving.

Lean Six Sigma applications are often associated with manufacturing environments. These principles, however, can also be applied to service systems in a non-manufacturing environment. This presentation demonstrates how a lean approach to structured problem solving optimizes the service system for walk-in students at the University of Kentucky Graduate School. The paper describes how optimal performance is achieved by improving the flow of walk-in students throughout their route for better wayfinding. The Eight-Step Problem Solving method is used to identify the prioritized problem in the current system and derive the best possible solution for improved performance. Various barriers encountered during the process will be discussed along with tactics used to minimize these difficulties in order to improve service quality. The use of knowledge gained from this study when implementing lean in other service environments will also be discussed.

3 – 3:20 p.m.

*Implementing Lean Six Sigma in a Manufacturing Process*
# 193 (I) Academic
Alexander Martin, Policarpo deMattos, Andre Marshall, Joi Emanuel, Senani Almutaz, Megan Watkins and Eui Park, North Carolina A&T State University
Objectives:
- Clearly understand the definition of Six Sigma.
- Understand the role of statistics in Six Sigma.
- Understand the primary tools used throughout the DMAIC methodology.
- The primary purpose of this paper is to understand process improvement.

This presentation reviews a study of a Six Sigma improvement team to illustrate how the methodology can be applied to enhance quality and increase production of the pen assembly system in a manufacturing environment by reducing the process variation. The team has identified the root causes of the variations in the process, which is presently operating at a three sigma. The expected results from this project are to streamline and standardize the manufacturing process, and systematically reduce errors that are causing halts to the assembly process through identification and adaptation of the new process standards; ultimately, increase pen assembly production output for sale by reducing production cycle time. Additionally, the team has been working on eliminating the waste that is present in the present process steps. Solutions are presently being tested and refined to be presented for management approval and implementation at the manufacturing plant.

**TRACK: LLS Case Study**
2:35 – 3:30 p.m.

*A Five-Year Lean Journey with the Steel Workers Union*
# 141 (All) Industry
Andy Britt, ContiTech

Objectives:
- Suggestions for getting buy in.
- Examples of Shop Floor Visuals.
- Examples of Rapid Improvement events and wins.
- An understanding that personalities can sometimes get in the way.

This is an overview of a five-year lean journey in a manufacturing shop in Ohio represented by the United Steel Workers Union. Examples of wins and struggles as well as methodologies for implementation will be shared. The journey from being led by outside consultants, to internal consultants, and how changes in plant management and union leadership have affected the dynamics will be discussed. Expect lots of interaction and discussion. This plant produces both fabric and steel reinforced conveyor belts for a variety of markets both domestic and international. ContiTech is a division of Continental and is located in Marysville, Ohio.

**TRACK: LSS Education**
2:35 – 3:30 p.m.

*Mobile Education: The Rise of Self-Serve Lean Learning*
# 122 (I) Industry
Collin McLoughlin, Enna

Objectives:
- Creating short, digestible learning content.
- Control of your internal learning programs.
Integrating on the job (OJT) training and learning traditionally done in the classroom.

Online learning is vital in today’s marketplace; even universities are seeing that it is a necessity going forward. In fact, over 65 percent of chief academic officers report that online education is critical to students’ long-term success.

So what does that mean to industry — to the manager or president who is looking to develop and retain good people? It means a paradigm shift is on the near horizon; to adopt this method of online training for your employees, not just send a few key people to events. Training has to be organization-wide to influence culture and sustain results and technology married with content is the answer. Due to the emerging prominence of mobile devices in our lives, it is only natural to incorporate mobile/online learning into work-related training.

This session will cover what leaders in industry are doing to marry education and work together; who is breaking down the conventions and getting more engaged workers; creating convenience, flexibility and a comfortable learning environment to match the expectations and behaviors of the 21st century employee.

Outcomes: You can take advantage of this session and learn how to tailor the training you already have to make it short and digestible, and deliver it in a method that resonates with your employees – giving learners control over time, place, path and pace of learning. This is the new learning paradigm.

**TRACK: Case Studies**

2:35 – 2:55 p.m.

**Excessive Metrics - aka Death by Spreadsheet**

# 111 (B) Academic

John Voltmer, The Solution Centre, Inc.

Objectives:

- What do "bad" metrics look like, and what is their effect on a business?
- What are the qualities of a "good" metric?
- What metrics do I need and how can I use them effectively?

We spend too much time and energy collecting, reporting and analyzing data to measure stuff in our businesses that we can neither influence nor fully understand. If we are truly process-oriented, we can understand and manage a process – or any part thereof – with just six metrics. And by attacking three of them aggressively, the other three will reflect the results of our actions in time to do something about it when we get it wrong. This presentation describes what makes a good metric, the metrics that are essential for process management, and the steps required to establish and leverage them in a manufacturing or service environment.

3 – 3:20 p.m.

**Utilization of Lean Six Sigma in Hospital’s Admission of Patients**

# 114 (I) Academic

Jeffrey Ang and Marylin Ang, Centro Escolar University

Objectives:

- Commitment to the application of Lean Six Sigma.
Researchers were to assess to what extent the selected tertiary hospitals in Metro Manila committed to the application of Lean Six Sigma in terms of top management involvement and support, quality-driven organizational culture, customer involvement, process management and implementation of quality improvement programs. Also, the levels of satisfaction of admitted patients in terms of room services, interpersonal skills and technical quality. Purposive sampling technique was used in choosing the respondents. Interviews were conducted and questionnaires were distributed to the employees and admitted patients of the hospitals. From the three hospitals selected every one reacted and concurred that from the gathered replies of the respondents their general level of fulfillment in services, skills and technical quality was good. This would imply that hospital staff had the capacity to give quality service to their customers. Therefore, Lean Six Sigma is an effective quality tool in the hospital for services.

**TRACK: LSS Research – Service**
3:35 – 4:20 p.m.

*Applying Industrial Engineering to Engage Transactional Teams!*

# 146 (B) Industry
Dodd Starbird, Implementation Partners LLC

Objectives:
- Understand the basic concepts of Engaged Team Performance.
- Discuss a case study of a transactional organization that did a time study of its human performance to improve processes and set standard times for performance.
- Compare and contrast the use of Lean and Six Sigma project approaches in manufacturing and transactional business processes.

The session will illustrate through a case study the modern-day application of classic industrial engineering concepts to engage transactional (non-manufacturing) teams.

The industrial engineering tools within Lean Six Sigma make perfect sense in a transactional environment, but they need to be tailored to be most effective. Transactional efforts need different definitions of waste, defects, flow and pull, with an added focus on using data to manage human performance. This session will share stories of transactional Lean Six Sigma efforts that achieved breakthrough results. Transactional improvement depends on getting the most out of people: the people are the machine!

This session will engage the participants to discuss their experiences with applying Lean Six Sigma in transactional businesses. We will discuss a real-life example of a bank that revolutionized its labor efficiency, customer satisfaction and employee morale by combining transactional Lean Six Sigma improvement with a purposeful design of those processes for teamwork and human performance.

**TRACK: LSS Management**
3:35 – 4:20 p.m.

*Lost in Translation: Making Strategic Planning Meaningful*
# 108 (B) Industry
Kelly Frankson, Vancouver Coastal Health

Objectives:
- Strategy deployment provides a vehicle for focusing an organization on key strategic priorities, aligning improvement efforts in all operations to these priorities.
- It requires a culture shift from traditional strategic planning to one where priorities or problems are translated from one level of the organization to the next using a ‘catchball approach’ which involves all levels of staff and leadership in an organization.
- Strategy deployment maps can be used as an effective tool to initiate discussions with staff in order to help translate and align priorities to daily work.
- The engagement of staff in the strategy deployment process and their participation in regular reviews is key to success.

This case study will focus on the implementation of strategy deployment at Vancouver Coastal Health, an organization of 24,000 people who started introducing lean in 2006. The focus was initially very project based but has since shifted towards cultural change. A huge piece of allowing this shift to happen was implementing a strategy deployment process incorporating concepts of Hoshin Kanri and Catchball. A case study will be introduced showing the process followed and the outcomes that resulted by formalizing the strategy deployment process within our Employee Engagement Team. A very useful template and engagement activity will be presented and lessons learned will be shared!

Friday, October 2

TRACK: LLS Applications
7:15 – 8 a.m.
Implementing Sustainability Into Your Existing Lean and Six Sigma Program
# 103 (B) Industry
Brion Hurley, Rockwell Collins

Objectives:
- How to identify green waste (waste not happening at the workplace after hours). Facilities departments help with the necessary utilities and efficiencies, while ES&H can help drive employee behavior to reduce excessive use.
- Reasons why sustainability doesn’t naturally incorporate into improvement programs, due to the hidden waste occurring off-hours, and the fact that waste is often times minimal at the process level, but large at the aggregate level.
- A quick summary of a green event and project implemented at Rockwell Collins (Six Sigma project and lean event format for energy reduction).
- Present a list of resources (books and websites) for more information to attendees (EPA Lean, books, training classes, etc.)
- A checklist for events when ES&H cannot be in attendance; make sure process changes have considered the environment.
The best approach to drive sustainability into your company is to incorporate it seamlessly into your existing continuous improvement (Lean Six Sigma) program, but it won't happen automatically without some key tips. Learn how to explain sustainability to employees and improvement personnel, identify green waste, run events and projects focused on green improvements, and align ES&H personnel.

**TRACK: LLS Education**
7:15 – 8 a.m.

*When Change is Good - The Kaizen Way in Intel Vietnam*
# 175 (I) Industry
Farrah Juban, Intel Corporation

Objectives:
- Implementing Kaizen events as a means to drive meeting targets in a factory setting.
- Kaizen is not just a pillar, it’s a method to learn about lean, study the process people do and let the experts, the people who do the job, take active part in the improvement.

In 2014 a challenge was brought to the Intel Vietnam factory was to drive the site to its affordability target through elimination of waste and variation. 2013 focused on setting the standards on how to execute methodologies while 2014 focused on execution. Kaizen, a new pillar needed to go for a test drive and exemplify results financially. Kaizen is a Japanese word from “Kai” meaning “Change” while “Zen” Means “Good.” It’s incremental continuous improvement involving cross-functional teams working together. Intel Vietnam successfully exemplified standards conducting 13 Kaizen events including creation of a certification program delivering 11 facilitators.

**TRACK: LLS Applications – Healthcare**
7:15 – 8 a.m.

*How Digital Impacts the Healthcare Industry*
# 107 (I) Industry
Tony Chihak, Mayo Clinic

Objectives:
- Why is it necessary for healthcare to have a digital strategy?
- What are the key components to a digital strategy?
- How does healthcare convince their patients that this is safe and cost effective?
- Case studies will be presented to show what Mayo Clinic and other health systems are doing with digital healthcare.

E-health is one of the most promising approaches to extending access and improving cost efficiency of healthcare delivery in both mature and emerging markets. E-health is a disruptive innovator that will only continue to grow by engaging patients to seek alternative ways to meet their healthcare needs in a cost-effective and personalized way. It represents a unique opportunity to deliver high-value care to consumers while also increasing the geographic scope of your organization and improving clinical outcomes. Some experts say U.S. hospitals are mired in bureaucracy and the regulations are creating roadblocks for doctors interested in deploying new technologies. This presentation will discuss how Mayo and the rest of the healthcare industry are embracing and developing strategies for this new digital world in order to lean out waste.
Understanding 5S: How Does Visual Management Activate Our Brain?
# 161 (B) Academic
Gabriela Salim Spagnol, Brunno Machado de Campos and Li Min Li, University of Campinas

Objectives:
- This research provides fundamental basis for lean managers, researchers and practitioners to justify the application of a lean healthcare tool in their workplace settings.
- Audience will understand the importance of visual management according to the steps of the 5S tool, based in findings from this research.
- Therefore, this study provides an initial understanding of how visual management relates to brain activation, contributing to develop research in Lean Healthcare based on concepts of neuroscience.

In order to enhance patient safety, efficiency and decrease professional workload, the 5S has been applied to organize the healthcare setting. This research investigates the brain activation during different levels of organization to further understand the importance of this tool. Five images that illustrate the progressive application of 5S were presented to 40 healthy volunteers during Functional Magnetic Resonance (fMRI) acquisitions in a block design on a 3T MR (Philips Achieva). In the first task, volunteers looked for healthcare items in a disorganized setting of medical and non-medical tools. The organization of objects in those images was improved until a completely standardized figure in the later (fifth) task. The fMRI images were preprocessed using SPM8 (www.fil.ion.ucl.ac.uk/spm) toolbox. Findings show areas related to visuospatial attention with significant increased brain activation during task five when compared to task one (Two sample T-test p<0.001), suggesting that 5S facilitates brain pathways for information processing.

TRACK: LLS Applications
8:15 – 9 a.m.
Advanced Statistical Methods for LSS BB/MBB Practitioners
# 102 (A) Industry
Scott Wise, SAS Institute, Inc.

Objectives:
This session will help make attendees aware of such powerful new methods as:
- Using exploratory data visualization to uncover the real story in your data.
- Apply advanced screening techniques to find key parameters in your data.
- Use the most efficient experimentation for optimized results in the fewest amounts of experimental runs.

With the rise of big data analytics and greater computing power, all Black Belts and Master Black Belts should begin to incorporate new advanced statistical methods into their Lean Six Sigma tool kit. Live case studies will be used to show these new advanced statistical practices in action.

TRACK: LLS Education
8:15 – 9 a.m.
Remote Coaching: Teaching Lean Long Distance
# 118 (All) Academic
Karyn Ross, Lean Consultant and Leslie Henckler, Paychex
Objectives:
- Identify remote coaching techniques and tools that can be used when the coach and lean learner are not in geographic proximity.
- Understand how to adapt traditional lean coaching approaches such as the Socratic method and A3 to remote learning situations.
- Explore online coaching approaches such as web-based learning sites and social media.

Think about coaching a student who is learning lean and the traditional “sensei – student” relationship comes to mind: student solving a problem under the watchful eye of the sensei, who asks questions and gives regular feedback at the gemba (the place where the work is done). This approach predicates the co-location of the sensei and student. However, today, as companies expand and have many locations, the sensei and student don’t always have the luxury of working together in the same location. This presentation will explore ways in which traditional lean coaching techniques and tools such as the Socratic Method and A3s can be adapted for long-distance teaching and learning. As well, this presentation will review contemporary virtual lean learning approaches such as interactive web-based learning sites and online learning communities. Even if the sensei and student can’t be co-located, “the teacher can still teach and the student can still learn.”

TRACK: LLS Applications – Healthcare
8:15 – 9 a.m.

Visualizing Data at Piedmont Healthcare
# 115 (All) Industry
Mark Jackson, Piedmont Healthcare

Objectives:
- Audience members will learn how Piedmont Healthcare established a successful data visualization program that is pervasive throughout the health system and across all functional areas.
- The audience will be exposed to a variety of Tableau exploratory dashboards.
- Audience members will see a demonstration of how dashboards are developed in Tableau.

The presenter will describe how Piedmont established a robust business intelligence program to support over 130 data workers with very limited resources. Piedmont is transforming the culture from one where data lagged by months, which caused many decisions to be made on gut feel, to one where data is always at our fingertips. Piedmont has engaged people at all levels within every entity and almost every department.

Attendees will get exposure to many of the information dense reports that we build around areas including:
- Hospital statistics
- Operational throughput
- Patient Safety / Quality
- Physician scorecards
- Labor productivity
- Clinical analysis
- Etc.
Application of Set-Based-Design in the Automotive and Manufacturing Industry

Bastian Luedtke, WZL RWTH Aachen

Objectives:
- Understanding of set-based-design as one method for Lean Development.
- State of the art of the implementation of set-based-design with the focus on the German speaking automotive and manufacturing industry.
- Main challenges for applying set-based-design in development projects.
- A methodological approach for the application of set-based-design by presenting a concept for a systematic solution alternative reduction.

Due to globalization, price pressure and a high product variety manufacturing companies are facing tremendous challenges, which are addressed by a unique market positioning and a focus on customers' needs. Therefore, many companies are trying to adopt the lean-principles to their R&D-departments. A lean-principle to increase the efficiency and effectiveness of development projects is set-based-design. Set-based-design states that despite a parallel development of multiple product design solution alternatives the overall efficiency and effectiveness of development projects can be increased. Though WARD firstly described set-based-design in 1997 it is still not fully implemented in the industry. The paper presents results of a study about the status quo of the implementation of set-based-design in the German manufacturing industry. One reason for the insufficient application of set-based-design is the inadequate process to reduce the solution alternatives over time. Next to the survey a method for a systematic solution alternative reduction is presented.

Lean Six Sigma Approach to Improve Glaucoma Treatment Compliance

Johanna Ficatier and Ertunga Ozelkan, UNC Charlotte

Objectives:
- Content: understanding the main factors contributing to non-compliance to the glaucoma treatment.
- Methods: Lean Six Sigma DMAIC methodology / multivariate Regression Analysis.
- Results: top factors of non-compliance to glaucoma treatment are identified and relative recommendations are given.

Compliance to the treatment is a major factor in the evolution of glaucoma. The purpose of this study is to identify the factors that result in non-compliance to glaucoma treatment in a Veterans Affairs Medical Center in North Carolina, using a Lean Six Sigma DMAIC (define, measure, analyze, improve, and control) methodology. In order to improve compliance to the treatment (i.e., adherence to prescribed medication) and thus patient care, past medical data are analyzed to identify influential factors for non-compliance. Some of the factors investigated include patient education about treatment, proximity to the treatment center, presence of a supportive unit, drug abuse history and past trauma record. As part of the Lean Six Sigma framework, a regression model is developed to be used as a decision-aid tool for the hospital and the medical doctors in order to detect and control compliance issues during the follow-up process.
**TRACK: LLS Applications**

9:05 – 9:50 a.m.

**Making Much More Money with Lean**

# 172 (B) Industry

Brian Maskell, BMA Inc.

Objectives:

- Understand the true economics of lean; it’s not about cost cutting.
- How to calculate the true financial benefits of lean change.
- Five ways to make more money with lean.
- How to make decisions that maximize profits and cash.

Lean is a powerhouse for change, improvement, growing the business, and making much more money. But there are a lot of misunderstandings related to HOW you can make a lot more money with a lean strategy.

In this short presentation we will address:

- The fundamentals of the economics of lean. How does a lean strategy make much more money for a company and how do they use this money for further benefit?
- We will then show a useful tool for understanding the true financial benefit that comes from lean change and improvement. It’s about a lot more than cost cutting.
- You will then learn five practical ways to make a lot more money from your lean operations.
- We will wrap up by showing how lean companies make better decisions that lead to better financial results.

**TRACK: LLS Education**

9:05 – 9:50 a.m.

**The Kinder, Gentler Process Engineer – Your Approach Matters**

# 119 (I) Industry

Vicki Wilson, Sentara Healthcare

Objectives:

- Apply the “kinder, gentler” approach when working with Leadership and teams.
- Comfortably “adjust” your current tool-kit to fit every situation.
- Apply “flexibility” as a tool.

When we all received our formal training, regardless of the subject, we took it as gospel – this is the way it’s done...period. With each new training session and various, “collectable” certifications, we were even more positive that what we knew was as clear as black and white. Well, suffice to say, I personally coined and continually solidified the process improvement usage of the term, “Navy gray” with each successive project. Yes, we know what we know, but as Rumsfeld said, “…there are things that we know we don’t know. But there are also unknown unknowns.” Bottom line – although we may be experts and certified professionals, we don’t know what’s inside the minds, daily jobs and visions of the clients we work with on projects. Thus, to be truly successful, we must adopt the “kinder, gentler engineering approach” of being flexible in our approaches, conversations and tailoring of “traditional” tools.
The Mainsaver Project – Six-Sigma Application in Healthcare
# 124 (I) Industry
Cynthia Quinones, University of Texas Health Science Center

Objectives:
- Apply Lean Six Sigma methodology to improve processes in healthcare.
- Tell your story using Six Sigma and return on investment.
- Improve working teams’ productivity.

Apply Lean Six Sigma methodology to develop and implement a process to create, complete and close work order tickets timely, and to determine the value of the working team’s work under the Safety Department of a healthcare institution. Process maps, cause-effect diagrams and moving range charts were used to identify the baseline process and the effect of the intervention. The improvement formalized processes, decreased by 30 percent the average number of dates tickets were open, increased the number of tickets created by 47 percent, increased the working team communication, collaboration and productivity, and illustrated the value of the team to the institution.

TRACK: Case Studies
9:05 – 9:25 a.m.
Applying Lean Conceptualization to Traffic Incident Management (TIM)
# 147 (All) Academic
Matteo Smullin and Chinweike Eseonu, Oregon State University

Objectives:
- Quantitative and qualitative documentation of bricolage gaps in TIM.
- Development of literature and survey-based recommendations for improved TIM efficacy.
- Development of heuristics and operating procedures for improved situational awareness and information diffusion.
- Development of organizational resilience through the lean concepts of continuous improvement and the lean tools of Kaizen.

Traffic incidents cost the United States economy $871 billion in annual repair, congestion and related expenditures. These costs are confounded by a lack of organizational learning, and a broader absence of a culture of continuous improvement. The literature exhibits gaps in lean implementation for complex, stressful and time-constrained agencies in Traffic Incident Management (TIM). From research we distinguish areas for improvement in TIM agencies. Issues such as operating procedures, information diffusion and interpretation, and organizational culture are viewed in the context of organizational resilience. We propose strategies for lean thinking in TIM, with a focus on training and conceptual application of concepts such as Kaizen, standardization, Andon and Poka-yokes. We view continuous improvement in the framework of organizational learning, rational thought, conceptual change and knowledge management. We understand our research to have applicability for decision-makers and managers in TIM agencies, and community-wide benefits through improved TIM efficacy.
9:30 – 9:50 a.m.

*Increasing the Efficiency of Development Projects Applying Predictive Analytics*

# 143 (I) Academic
Christian Dölle, RWTH Aachen University

Objectives:
- Understanding value stream analysis within product development.
- Application of predictive analytics within product development.
- Methodological approach to increase efficiency within product development projects by aid of predictive analytics.

Producing companies in high-wage countries strive towards shortened development and innovation cycles and at the same time decreased costs in order to strengthen their competitive position. These goals can be achieved by efficient and lean development projects. However, approaches aimed at designing efficient development processes such as the value stream analysis only analyze development projects retrospectively as well as periodically and therefore do not continuously improve the efficiency of the respective projects themselves. This presentation discusses a concept to anticipate deviations from the target process and thus inefficiencies within development projects by aid of predictive analytics. It is stated that predictive analytics approaches can be adapted to predict deviations in development projects, comparable to the anticipation of crimes. In this context deviations in terms of time, cost and quality are the result of waste and therefore a dimension for inefficiencies. To identify activities within product development projects often deviating from their target state the hot spot analysis is adapted from the area of predictive crime analysis. Therefore, the presented concept enhances the efficiency of product development projects by anticipating deviations from the target process allowing the implementation of preventive measures to eliminate waste.

**TRACK: LLS Research – Case Studies**

10:05 – 10:50 a.m.

*Emergency Department Effectiveness*

# 137 (I) Industry
Sheila Dyas, Huntsville Hospital System

Objectives:
- Understand how Overall Equipment Effectiveness can be modified to represent Emergency Department Effectiveness.
- Identify various quality of patient care metrics and employ behavioral fault analysis to customize them for a particular emergency department.
- Explain in detail how Emergency Department Effectiveness can be used as an overall key performance indicator for an emergency department and specific entities’ performance within the department.

Today’s economic and regulatory environment is forcing emergency departments to care for more patients in less time. Measurements such as door to provider, time to disposition and length of stay are shifting the focus from higher quality of patient care to increased productivity. In manufacturing, Overall Equipment Effectiveness (OEE) combines productivity and quality to provide a key performance indicator for process improvement success. This presentation will demonstrate how to redefine the variables of OEE so that they are relevant to an emergency department’s operation. The new metric created, titled Emergency Department Effectiveness, can be used as a key performance indicator for
lean process improvements undertaken in emergency departments. Using Emergency Department Effectiveness to measure process improvement success enables quality patient care to remain part of the equation in the emergency department’s quest to become more productive.

**TRACK: LSS Applications**
10:05 – 10:50 a.m.

**Law Firm, Bankruptcy Department Resource Planning**
# 152 (I) Industry
Kevin Divine, The Hunoval Law Firm and Ertunga Ozelkan, UNC Charlotte

Objectives:
In partnership with the University of North Carolina at Charlotte (UNC Charlotte), the Hunoval Law Firm re-defines process standards and drives fact-based performance into an industry that has gone vastly unchanged for hundreds of years. The purpose of this presentation is to discuss how Hunoval has used Takt Time and Cycle Time to conduct resource planning, driving measurable business results.

- Resource Planning
- Takt Time, Cycle-time tool
- Obtaining Business Results

The Hunoval Law Firm (HLF), PLLC, provides a full range of real estate legal services across the states of North Carolina, South Carolina and Virginia. Much of the legal work that it processes follows standard, repetitive steps. In fact, within the industry, such firms are often referred to as “paper mills.” As such, the firm began to investigate Lean Six Sigma (LSS) and other continuous improvement methodologies.

In our Bankruptcy Department, the Notice of Appearance (NOA) process is currently averaging 13.3 days in October, with a range of 3 to 105 Days. Client expectations (VOC) are that NOAs be filed in 10 days or less. The more consistently we meet this service level, the more referrals the client will send us.

In this case study, we demonstrate how resource planning can overcome issues that delay processing. We identify lag times and issues causing delays in filing NOAs, so that we can consistently and predictably meet or exceed client expectations. Results are measured in revenue to the company.

**TRACK: LLS Education / Research – Case Studies**
10:05 – 10:25 a.m.

**Lean Gamification: Framework and Assessment**
# 144 (I) Academic
Ahmed Deif and Eric Olsen, California Polytechnic State University

Objectives:
- Lean gamification concept.
- Assessment techniques for lean gamification.
- Challenges for lean gamification.
This presentation discusses a pedagogical methodology based on an integrated approach to combine gamification with the attention, relevance, confidence and satisfaction (ARCS) model of motivational design to develop, implement and evaluate a Lean Systems game-based curriculum. The evaluation will aim at studying the major parameters in the game-based pedagogical approach that motivate students to learn by doing in this very practical field. This will eventually lead to improving how different lean systems as well as other process improvement fields are taught and also will increase students’ engagement level.

10:30 – 10:50 a.m.

**Improving the Quality and Efficiency of an Organization’s Operational Scenario**

# 148 (All) Academic

Constantine Koursaris, College of Business, Embry-Riddle Aeronautical University

Objectives:
- Identifying true defects and eliminating false-positives.
- Paving the way to implement a Lean Six Sigma process.
- Controlling costs by eliminating costs of poor quality.
- Operating at an optimal state.

When an organization is tasked to develop a new product for a customer, it is recommended to use the Design for Six Sigma (DFSS) or the Six Sigma Define, Measure, Analyze, Design, Verify (DMADV) methodology, in order to be able to implement a Lean Six Sigma process in the end. The DMAV process is used to improve the system under design.

This presentation discusses and analyzes two techniques used to identify true defects, and methods to control costs by eliminating the costs of poor quality. The goal of the supplier is to operate at an optimal state, with the ability to verify the design performance, and meet or exceed customer expectations at the time of product delivery, thus maximizing the organization’s return on investment.

**TRACK: LLS Research – Case Studies**

10:55 – 11:15 a.m.

**Identifying Variations in the Manufacturing of Parachute Bags**

# 192 (I) Academic

Hussain Abualkhair, Policarpo deMattos, Santosh Parupelli, Aaron Rollinson Jared Banks, Faisal Aldawood, Rahul Ponnam, Eui Park, North Carolina A&T State University

Objectives:
- Finding common causes of variation by using statistical methods.
- Reducing variations in manufacturing processes helps, making systems more reliable.
- Design a simple fixed template within specification limits of measurements to ensure better quality in future production.
- Reducing variation and implementing solutions will increase the customer satisfactions and improve the financial health for the organization.

The use of parachute bags is a vital part of military affairs; more importantly these parachutes bags cannot fail while in use. The project was focused on the measure of variability in parachute bags manufactured by a manufacturing
organization. These bags are used in military service and cannot have any physical defects. However, there is variability in the measurements from bag to bag. This project team used Six Sigma tools and techniques to identify the sources of variation. Specifically, the team used the DMAIC methodology during this project. Results from this project should allow the organization to correctly identify at what point in their process variations are occurring. The reduction of variation in this manufacturing process allows for cutting unnecessary costs and improves process efficiency.

11:20 – 11:40 a.m.

Application of "Lean Government" Tools in a Public Entity of Colombia
# 186 (B) Academic
Javier Ojeda, Universidad Nacional de Colombia

Objectives:
- Appropriation of lean in the public sector.
- Benefits of lean government in Latin America.
- Best practices of lean in public sector.

This presentation originates from the work done in a public entity in Colombia which currently sees no need to decrease waste. Such entity has not been seen as a company and generally has not applied engineering tools for improvement. The study was performed in a specific unit of this entity which identifies and applies lean principles to optimize the processes of this unit, since the writing of procedures to the implementation of 5s, Kaizen, among other lean tools. The biggest challenge was found in socialization and appropriation of the concepts of "lean government" among officials. As a result considerable improvements were obtained in the efficient delivery of services to beneficiaries of the entity and the economic benefits to the reduction of waste that had not been measured by a government entity.

TRACK: LSS Applications – Healthcare
10:55 – 11:40 a.m.

Using Ergonomics to Achieve Safe Production
# 127 (I) Industry
Jeffrey Smagacz, Risk Management Group

Objectives:
- Understand ergonomics and the development of workplace injury.
- Understand the primary ergonomic risk factors that contribute to workplace waste.
- Identify four opportunities to reduce workplace waste and drive safe production.

Successful companies are finding that ergonomics is a critical factor in the success of their lean initiative. When companies consider ergonomics when making job changes, they experience big savings and fewer injuries after they “lean out” a work area. Ergonomics is a critical waste to be eliminated in a lean initiative. Ergonomics is a basic understanding that people have limits to what they can and cannot do. When human limits are not considered – such as excessive reaching, bending, twisting and walking – the price is often expensive injuries and more inefficient processes.
Lean practices drive accelerated workplace changes and ergonomics is an enabling approach to ensure lean success. When ergonomics is part of workplace change, companies experience a great opportunity: achieve not safety or production, but safe production.

**TRACK: LSS Applications**
10:55 – 11:40 a.m.

**Emergency Center Pharmacy Staffing and Scheduling Model**
# 120 (All) Industry
Mohamed Ait Aiss and Laura Burke, MD Anderson Cancer Center

Objectives:
- Work measurement techniques.
- MTM-UAS (Methods-Time Measurement) pre-determined time study.
- Quality function deployment.
- Staffing and scheduling tool.

Staffing and scheduling optimally is critical for maximizing efficiency and providing safe patient care. The Emergency Center at MD Anderson Cancer Center treats 60-80 patients per day. The EC Pharmacy provides 24-hour support to these patients for medication needs as well as after-hours support for prescriptions and IVs to other clinics. This project looked at staffing and scheduling needs for pharmacists and technicians in the pharmacy by hour of day and day of week. We first developed a list of all work activities done in the pharmacy and then used time motion analysis to develop standard times for each activity. We then analyzed data from multiple institutional sources to determine the frequency of each activity by hour of day. We developed macros in Excel that calculate the recommended staffing for each position under baseline conditions and with changes in volume and work distribution. Finally, we developed a tool that allows the user to compare current staff schedules by hour of day with staffing needs. The user has the option to update shift start times and shift lengths to change the number of staff at each hour of the day. These changes automatically update graphs that show recommended staffing and proposed staffing and allow leadership to experiment with new staffing schedules in order to determine optimal coverage. This presentation will demonstrate the functionality and benefits of the model as well as recommend applications for use in other 24/7 settings.

10:55 – 11:40 a.m.

**Applying the Formula for Change to Sustain LSS Improvements**
# 171 (I) Industry
Mark Nestle, Praxair, Inc.

Objectives:
- Understand the basic Gleicher/Dannemiller “Formula for Change” and its history.
- Learn a new fourth component to the formula Hc, the “History of Local Changes.”
- Briefly compare four-component formulas to some popular change management methodologies and the grieving process.
- Learn tools to maximize each component to reduce resistance to change and better assure gains from LSS projects are sustained.
Most changes don’t stick or rapidly degrade, due to how the change was initially managed. Laying a good change foundation cements the impact, sustaining it. This presentation applies the author’s LSS and quality improvement experience that created an adaption to the Gleicher/Dannemiller “Formula for Change.” Focus is on its simple elegance and robustness. Starting with the origin and history of the Gleicher/Dannemiller formula (Dp*Vf*Fc>Rc). We add the author’s new fourth component Hc, History of Changes that completes the time dimension. This four-component formula is briefly compared to other popular change management methodologies (Kotter, McKinsey, etc.) also comparing how to manage emotions during change like in a grieving process. Then provide details for each component on pitfalls to watch for, actions to take and specific LSS tools that can be used to address the resistance to change and successfully maximize each component in the Formula for Change (Dp, Vf, Fc, and Hc).

**TRACK: LSS Education – Applications**
1:55 – 2:40 p.m.

**Operational Rounding – Empowering Hospital Frontline Staff to Be Lean Leaders**
# 135 (All) Industry
Kelly Murray-Weakley and Lauren Haile, Care Logistics

Objectives:
- Understand the components of Operational Rounding.
- Understand the Operational Rounding Roles and Processes.
- Learn how to promote a continuous learning culture and implement Operational Rounding at your facility.

Operational Rounding is a weekly continuous process improvement methodology that enables frontline staff to translate data into action. Senior leaders establish KPIs for the organization, which are then used by the frontline staff to guide development of department-level goals. Frontline staff utilizes lean principals and the plan-do-check-act cycle to address opportunities for improvement in their departments based on their data and department-level goals. On a weekly basis these opportunities and PDCA cycles are presented to Senior Leadership for visibility, direction and further support.

Establishing a weekly rhythm for Operational Rounding empowers and motivates frontline staff to continuously seek and cause change within their departments. By enabling frontline hospital staff to become active participants of this process, the hospital becomes a learning organization strong in communication, problem solving, collaboration and mentoring skills.

**TRACK: LSS Research – Case Studies**
1:55 – 2:40 p.m.

**Sustainable Visual Management Systems for the Maintenance Storeroom**
# 153 (All) Industry
Bobbi Ferguson, Curtiss Wright EMD

Objectives:
This presentation discusses the challenges related to the planning and executing of maintenance work orders with their necessary repair parts in a unionized shop.
- Variability of repair items kept in stock.
- Information deficits on the condition of inventory items.
- How to turn clutter into productive flow into and out of the storeroom.
• Techniques that make it so simple that it stays sustained.

Our storeroom was so full of machine parts, leftover spools of wire and light bulbs that it was easier to order new materials for a maintenance job than it was to go and find what we had on-hand. The flow had stopped in the storeroom and it was just filling up. This case study describes the challenges and solutions that we used to bring order to the storeroom.

We decided to eliminate the database approach to inventory and use Visual Management techniques as defined by Gwendolyn Galsworth. Our goal is to use the ideas of the crafts people to design systems that are so simple that they are self-sustaining.

Home locations allow the system to speak to maintenance planners, engineers, storeroom attendants and crafts people about what is in the storeroom. Managed levels of inventory are defined and the variability of what is stored is monitored in business terms.

**TRACK: LSS Applications – Professional Development**
1:55 – 2:40 p.m.

*Mastering Your Own Lean Professional Transitions*

# 110 (I) Industry
Jean Ann Larson, Jean Ann Larson & Associates

Objectives:
Lean affects us and our organizations. It will lead to exciting new opportunities for each of us as well as our colleagues. This session provides a journey of self-discovery to enable you to understand and grow from the inevitable professional changes that will affect you during your career as a lean practitioner and beyond.

- After attending this session, participants will gain knowledge of how they can harness professional transitions to enrich their career as Lean Practitioners.
- Through the use of an individual change readiness assessment participants will be able to leverage their own unique change readiness profile to help them effectively navigate lifelong career changes.
- After attending the session, participants will gain clarity around how to best engage in future professional transitions regardless of whether they are early careerists, making a lateral move, starting a new career, accepting a promotion, moving to a new organization or preparing for retirement.

As lean practitioners, we will experience a variety of transitions throughout our careers. Some planned and others not. Helping ourselves and others grow and thrive through these transitions can be important to maintaining our ability to provide value as lean professionals. This session will walk participants through an assessment of self-discovery as well as share practical tools to enhance their abilities to continuously learn from change and transition. They will be better positioned to coach their teams and associates as their organizations become leaner and are transformed into new improved organizations.

**TRACK: LLS Research – Case Studies**
1:55 – 2:40 p.m.

*Living Longer in Retirement with Lean and Six Sigma*

# 155 (B) Industry
Jay Watson, Ports America

Objectives:
- Driving It Home.
- Living Safer with Lean and Six Sigma.
- Living Better with Lean and Six Sigma.
- Accomplishing more everyday with Lean and Six Sigma.

Perhaps pertinent to you – your parents or grandparents – this case study chronicles the application of Lean and Six Sigma techniques outside of work, that is, within your personal life. By utilizing these techniques at home; quality of life – especially in the senior years – can be greatly enhanced and indeed, be safer and even more productive than ever imagined.

This lighthearted and entertaining look into the golden years will showcase a dozen applications of L6S techniques that make life just a little easier. From poka-yoke to point-of-use tooling, from 5S to S.P.C. – you'll walk away with at least one great idea to put into use.

It all starts with a 'Safety First' mentality – what we at Sun City translate as "Hips, Trips and Falls..." and now, you can see the fun we're going to have at this session. Seriously though, just like at work – it’s all about People, Processes and Results!

As Mr. Spock espoused, "Live long and prosper!" Learn how here.

**TRACK: LSS Education – Applications**
2:45 – 3:30 p.m.

**0 to 60 in 3.5 Seconds: An Open Enrollment Challenge**
# 132 (B) Industry
Katherine Vern, Blue Cross and Blue Shield of Michigan

Objectives:
- Reducing lead time in a service environment.
- Influencing human behavior with an Interactive Voice Response system (phone menu options).
- Understanding the impact of the Affordable Care Act on customer-facing entities at health insurers.

The Affordable Care Act introduction resulted in a shorter open enrollment period for people who purchase their own health insurance. This creates a seasonal spike in call volumes, increasing the need for Customer Service Representative (CSR) capacity by 25-200 percent for just two months in the year. Blue Cross and Blue Shield of Michigan conducted a project to evaluate the reasons for capacity shortages and options to address them. This resulted in a 50 percent reduction in lead time for CSRs taking calls. Calls serviced by a CSR in the first 90 days of employment increased by almost 200 percent. The Interactive Voice Response (IVR) system options were modified to route calls to specialized CSRs. Prior to the changes approximately 40 percent of members called with billing questions but less than 10 percent selected the billing option from the phone menu. Following the change, 37 percent selected the billing option from the phone menu.
Objectives:

- Overview of lean tools.
- Six Sigma DMAIC philosophy.
- Implementation approach of Lean and Six Sigma in a service function.

In general, improving productivity and trimming expenditures are the ongoing business goals of any organizations. Six Sigma Define-Measure-Analyze-Improve-Control (DMAIC) methodology has been widely used across industries as the best systematic and data driven improvement approach. Lean and Six Sigma methodologies have traditionally been employed to bring improvement in manufacturing processes. However, in a recent competitive and tough business scenario, it has become a necessity to embed these philosophies in the fabric of the entire organization, including service functions, as a vehicle to increase productivity and business profitability. This presentation discusses a case study of improving recruitment process for an upcoming steel plant in eastern India. In order to obtain desired productivity of the recruiting team and to reduce recruitment cost, improvement options have been identified by employing the lean and Six Sigma philosophy. An overall reduction of almost 50 percent in recruitment cost is envisaged upon implementation of identified improvement options.