QUEST
Senior Conference

2012 Conference Program
&
Projects Portfolio

Conference Sponsors:

ATK  pwc  SAIC
December 2012

Dear QUEST Seniors:

Congratulations on the completion of your QUEST capstone course!

The QUEST Honors Program is well known for its rigorous academic standards, so your success is one to be celebrated. Through your coursework with QUEST, you will be entering the professional world with extensive knowledge of teamwork, innovation, and real-world problem solving. These are essential skills for cultivating a bright future.

I am pleased to see that QUEST continues to build its vibrant alumni network and to prepare its students for international partnerships. QUEST’s active participation in study abroad trips to such places as Tunisia, China, and Brazil shows that QUEST students understand the criticality of establishing diverse, professional relationships across borders.

The University is proud of your achievements and wishes you the best in your conference presentations. I am confident that your experiences in the QUEST program will serve you well beyond the University of Maryland.

Sincerely,

Wallace D. Loh
President
QUEST WELCOMES

Alumni
Family & Friends
Corporate Partners
Students
University Colleagues
Consulting Project Clients
  ATK Defense Group
  Bakery Express
  BD
  Bowles Fluidics
  Middle River Aircraft Systems
  Lockheed Martin
  SAIC
  TEDCO
  Tulkoff Food Products
Table of Contents

Conference Program & Student Presentation Schedule 5
Consulting Projects Portfolio
ATK Defense Group (Complete Compliance) 6
ATK Defense Group (Mergers & Acquisitions) 7
Bakery Express 8
BD 9
Bowles Fluidics 10
Middle River Aircraft Systems (Aircraft Manufacturing) 11
Middle River Aircraft Systems (Design Process) 12
Lockheed Martin 13
SAIC (Cybersecurity) 14
SAIC (Propaganda) 15
TEDCO 16
Tulkoff Food Products 17
QUEST Information
   Faculty and Leadership 18—21
   About QUEST 22
Former Projects of the Year 23
QUEST Sponsors 24
Special Thanks & Acknowledgements 25
Conference Program

Registration & Storyboard Display
Rever Alumni Hall of Fame and Grand Ballroom
5:30 – 6:00 pm

Welcome
Grand Ballroom
6:00 pm

Student Presentation Breakout Sessions
(Please see the chart below.)
6:20 pm

Project of the Year and Closing Remarks
Grand Ballroom
7:40 pm

Reception
Rever Alumni Hall of Fame
8:00 pm

Student Presentation Breakout Sessions

Guests will progress to the student presentations from the welcome in the ballroom. Guests may attend presentations in any room. Time has been built into each session for guests to move to other rooms in-between presentations. Each session will be 15 minutes with a 2 minute transition interval.

Student ushers are available for guests who are looking for specific rooms and presentations.

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<tr>
<th>Ballroom A</th>
<th>Ballroom B</th>
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<td>Session 1 Middle River Aircraft Systems (Aircraft Manufacturing)</td>
<td>SAIC (Cybersecurity)</td>
<td>Bowles Fluidics</td>
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<td>Session 2 Middle River Aircraft Systems (Design Process)</td>
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<td>Bakery Express</td>
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<td>Session 3 ATK Defense Group (Complete Compliance)</td>
<td>BD</td>
<td>TEDCO</td>
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<td>Session 4 Lockheed Martin</td>
<td>Tulkoff Food Products</td>
<td>ATK Defense Group (Mergers &amp; Acquisitions)</td>
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Refreshments will be available in the Rever Alumni Hall of Fame between the Student Presentation Breakout Sessions.
ORGANIZATION PROFILE:
ATK Defense Group is a global company that develops and manufactures highly-engineered materials and products that support mission-critical applications for our defense, aerospace, and security customers. By developing affordable, innovative solutions, ATK has become an industry leader in missile defense systems, solid rocket propulsion, and sporting ammunition.

Project Champion: Brittany Brower, Compliance & Subcontracts Administrator, ATK Defense Group
Faculty Advisor: Dr. Thomas Corsi, Co-Director, Robert H. Smith School of Business, Supply Chain Management Center

QUEST STUDENT TEAM: TEAM ROCK-IT

PROJECT ABSTRACT
ATK Defense Group has noticed a higher frequency of purchased parts arriving with paperwork noncompliances than in past years. Products arriving without the proper paperwork have lead to countless wasted man-hours trying to correct the problem and schedule delays while the products wait in shipping and receiving. Team Rock-It was posed with the task of identifying the most common reasons for the noncompliances and developing recommendations aimed at reducing the percentage of noncomplying parts by 50%.

KEY CONTRIBUTIONS AND RECOMMENDATIONS
After gathering more information from both the vendors and ATK, Team Rock-It identified the most common reasons for noncompliances: ambiguity about what the vendor is required to do, finding the necessary provisions online, and keeping the quality provisions up to date. The solution, which includes a redesigned and easier to use web interface addresses all of these areas for improvement. The sleeker user interface and easier online access facilitates finding the necessary quality procedures and ensures they will be up to date. The system generates a checklist with summaries of all necessary provision to reduce any confusion over the action items required by the vendors.

Michael Hamilton
B.S. Aerospace Engineering
Expected May 2013

Christopher Bilger
B.S. Mechanical Engineering
Expected May 2013

Nathan Elencweig
B.S. Mechanical Engineering
Expected May 2013

Jacob Stoehr
B.S. Supply-Chain Management
Expected May 2013

Ethan Shapir
B.A. Marketing
Expected May 2013
**ORGANIZATION PROFILE:**

ATK Defense Group is a global industrial company that develops and manufactures highly-engineered materials and products that support mission-critical applications for our defense, aerospace, and security customers. By developing affordable, innovative solutions, ATK has become an industry leader in missile defense systems, solid rocket propulsion, and sporting ammunition.

**Project Champion:** Kurt McIntyre, Strategic Market Analyst, Business Development, ATK Defense Group  
**Faculty Advisor:** Dr. J. Gerald Suarez, Professor of Practice in Systems Thinking & Design, Department of Management and Organization, Robert H. Smith School of Business

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**QUEST STUDENT TEAM:** **MAKING ALPHA**

**PROJECT ABSTRACT**

Revenue growth for companies can occur in two ways; organically, through product or service sales, and inorganically, through mergers & acquisitions (M&A) transactions. In M&A transactions, corporate valuation models are essential tools that help the involved parties make informed decisions. These models evaluate and predict the financial well being of an entity that would result from a merger or acquisition. Current valuation techniques at ATK require the creation of a new model for each deal, and extensive training for them to be used effectively. This inefficient process can delay important decisions and create unnecessary workloads. In our project, we have created an intuitive model that integrates standardized information to output unique valuation metrics and summarizes important information for enhanced decision-making.

**KEY CONTRIBUTIONS AND RECOMMENDATIONS**

We have developed a Microsoft Excel-based valuation model that analyzes financial information from the Bloomberg database. Following the input of standardized financial statements, which is as simple as copying and pasting information from Bloomberg, the model then integrates the information into prepared financial statements and valuation methods. Our model includes a comprehensive instructions page for new users and is color-coded for intuitiveness. We have also included an output page that graphically summarizes desired information using intuitive graphical tools and tables that can easily be copied into presentations for further discussion. Our model will allow our client to make more informed decisions about mergers & acquisition transactions in a faster and more effective manner.
**Organization Profile:**
Bakery Express is a mid-size baked goods manufacturer located in Halethorpe, MD, right outside of Baltimore. The company bakes products for many retailers such as Olive Garden and 7/11. Bakery Express is a privately run business that produces more than just wholesale pastries but also provides specialized goods directly to their consumers.

**Project Champion:** Barbara Berry, Assistant General Manager; Jon Burns, Director of Quality Assurance
**Faculty Advisor:** Dr. Hassan Ibrahim, Decisions, Operations, and Information Technologies, Robert H. Smith School of Business

**Quest Student Team: Fresh Baked Solutions**

**Project Abstract**
Fresh Baked Solutions aimed to increase the efficiency and operations of Bakery Express by creating a process for paperless production. This process will integrate various departments including accounting, purchasing, inventory management (raw materials and finished goods), quality assurance, and receiving. Fresh Baked Solutions has provided recommendations related to both software and process. The team’s recommendations will result in cost savings and time savings, as well as minimizing inefficiencies and error.

**Key Contributions and Recommendations**
The main features of our findings provide a recommendation for an off-the-shelf inventory management solution. This system includes both software and hardware elements. In addition, we have provided a written implementation plan to guide the company through the integration of their new system. The benefits this solution provides are cost and time savings due to the elimination of pen and paper tracking. Also, this system saves the costs of wasted inventory as a result of human tracking errors. A final benefit of this system is the increase in convenience and efficiency which will prove invaluable.
Organization Profile: BD is a medical technology company that manufactures and sells medical supplies, devices, laboratory equipment and diagnostic products. The BACTEC FX is a manually loaded diagnostic instrument manufactured by BD and used to detect bacteria in blood samples. BD has substantial market share with their current BACTEC FX model and is looking to further enhance its capabilities as they begin to evolve their products to fully automated systems.

Department: BD
Project Champion: Tim Hansen, Senior Manager, Diagnostics Division
Faculty Advisor: Dr. Keith Herold, Associate Professor, Fischell Department of Bioengineering, A. James Clark School of Engineering

Quest Student Team: Kie Solutions

Project Abstract

Over the past century, automation has led to improvements in process efficiency and accuracy for many industries. In the field of microbiology, a great number of repetitive tasks need to be completed by a shrinking labor force, making automation both viable and necessary. As hospitals and laboratories consolidate, the number of blood samples to be processed at any one site will increase, making automation even more important. As part of BD’s move towards total lab automation, we were tasked with automating the blood culture process from specimen arrival to disposal or further subculture using the current BACTEC FX system as a foundation.

Key Contributions and Recommendations

Our key contributions included quantitative and qualitative primary research of BD’s customer base, design conceptualization and detailed sketches of automated blood culture system and Preliminary Requirements Document, “PRD” outlining design specifications for BD’s automated blood culture processing system. Our design recommendations included a queuing accumulation table, scanning and weighing 2D barcode and High Accuracy Check Weigher, a transport conveyor belt, and a cradle system for loading and unloading.
**ORGANIZATION PROFILE:**
Bowles Fluidics Corporation is a small, Maryland-based company that manufactures and distributes fluidic technology, which is a type of product that distributes fluid with no moving parts. The wide range of products that they offer, both automotive and non-automotive, place them in competition with much larger companies in a competitive market. Since their establishment in 1961, they have become one of the most reliable suppliers in the nozzle-making industry.

**Department:** Quality Systems  
**Project Champion:** Chi Srinath, Vice President, Quality Systems  
**Faculty Advisor:** Dr. Nicole M. Coomber, Associate Director QUEST Honors Program; Lecturer of Management & Organization, Robert H. Smith School of Business

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**QUEST Student Team: Fluid Logic**

**PROJECT ABSTRACT**
In order to produce fluidic nozzles efficiently and keep quality records for each batch, Bowles Fluidics Corporation prints thousands of pages every week to track the development of their parts. The majority of this paper is seen on the manufacturing floor of their facilities as employees perform their daily tasks and record their progress. As a means to become more efficient and reduce the time and money spent on printing, collating and distributing paper on the manufacturing floor, Team Fluid Logic aims to help Bowles Fluidics Corporation transition into paperless manufacturing. Focusing mainly on the injection, molding and quality assurance areas of their manufacturing floor, the team presents recommendations for hardware, software, and implementation procedures at Bowles Fluidics’ Columbia, Maryland facility.

**KEY CONTRIBUTIONS AND RECOMMENDATIONS**
In terms of hardware, Team Fluid Logic recommends the purchase of four Google Nexus 7-inch tablets to be connected wirelessly to company networks. These portable devices will allow for a high degree of flexibility and instant information exchange. The team suggests an augmented use of Intelex as a cloud-based quality management software, especially as Bowles Fluidics plans a transition in the future to Microsoft SharePoint or other content management tools. Finally, the team presents a detailed implementation plan to Bowles Fluidics Corporation to assist in change management and the transition that will come a move to paperless manufacturing.
**Organization Profile:**

Middle River Aircraft Systems, a subsidiary of GE Aviation, engages in the design and manufacturing of aerostuctures and components for commercial and military aircrafts in the United States and around the world. Its products and services include jet engine thrust reversers, nacelle systems, control surfaces, composites, and technical support. The company serves aircraft manufacturers in commercial and government markets. Founded in 1929, the company is headquartered in Middle River, Maryland.

**Project Champion:** David Webster, Project Manager, Manufacturing Engineering  
**Faculty Advisor:** Dr. Jeffrey Herrmann, Associate Director, QUEST Honors Program; Professor of Mechanical Engineering, A. James Clark School of Engineering

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**Project Abstract**

Middle River Aircraft Systems (MRAS) is currently building a new factory in Ellisville, Mississippi that will produce A320 and Passport 20 nacelle parts. TurboThink was asked to support MRAS in understanding the risks and limitations involved with opening the new facility. This included maximizing the factory’s output by optimizing the work cell layout design of the Layup Room. Our project required in-depth knowledge of cell manufacturing, product engineering processes, use of quantitative analyses, and an understanding of Environmental, Health, and Safety concerns.

**Key Contributions and Recommendations**

To achieve the goal of maximizing production output with limited factory space, we have modified the company’s original blueprint to add more work cells and strategically repositioned them within the design to augment production capacity by at least 33%. Our final recommendations take into account Environmental, Health, and Safety considerations; this ensures that employees can operate in a comfortable space conducive to work productivity. Additionally, in order to assist the company with implementing our recommendation, we have analyzed their desired ramp-up rate and proposed a plan for phased construction of work cells. By dividing up the construction of work cells into multiple stages, the company will experience significant efficiencies in both cost and time.
**THE QUEST - MIDDLE RIVER AIRCRAFT SYSTEMS (DESIGN PROCESS) PROJECT**

**STREAMLINING THE DESIGN PROCESS**

**ORGANIZATION PROFILE:**
Middle River Aircraft Systems (MRAS) is a subsidiary of GE that specializes in nacelle assembly, which is an aerodynamic shell that goes around the engines of airplanes in order to reduce drag and provide thrust reversal. This ensures the efficiency and safety of commercial airplanes. MRAS primarily works on commercial airplanes and has recently started working on three separate projects.

**Department:** MRAS-A Subsidiary  
**Project Champions:** Chris Sanford, Engineering Operations Leader, MRAS-A Subsidiary of GE  
**Faculty Advisor:** Professor David Ashley, Executive in Residence QUEST Honors Program; Analyst Department of Homeland Security

**QUEST Student Team:** Quality Aeronautics Consulting

**PROJECT ABSTRACT**
Our project scope involved documenting the MRAS current design phase process, outlining their most common inefficiencies, and providing them with a new streamlined design process. After joining GE, MRAS has been receiving an increase in work. This has created an influx of inexperienced designers who must quickly be brought up to speed to be a productive part of the company. This project will be able to provide MRAS with a template for future design projects, saving them time and money.

**KEY CONTRIBUTIONS AND RECOMMENDATIONS**
Our team was successful in documenting their current design process by speaking with several members of their design team. We presented them with a process flow map of their system and indicated the inefficiencies that exist within the system, all of which have been verified. We recommended a new design process that optimizes the process and cuts out on redundancies. Our other recommendations include a checklist that they can use as a project management tool throughout the process and a method of formal training for their new designers to allow them get up to speed on common knowledge within the company more quickly.
**Organization Profile:**
Lockheed Martin, a leading global security and engineering company, provides Help Desk services to its many clients. Within Lockheed Martin, the Mission Systems and Sensors (MS2) division executes nearly 500 programs for US military, providing radar, surveillance system, and other advanced technology products. LM Help Desks are responsible for providing unique support and customer service to their diverse clientele.

**Department:** Mission Systems & Sensors (MS2)

**Project Champion:** Richard Grandrino, Manager, Moorestown Customer Service and Maintenance/ Field Service Engineering

**Faculty Advisor:** Professor David Ashley, Executive in Residence QUEST Honors Program; Analyst Department of Homeland Security

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**Quest Student Team: Team QNA**

**Project Abstract**
Lockheed Martin Mission Systems & Sensors (MS2) currently operates four Help Desk centers for product and technical company support. Team Q&A was provided with the opportunity to analyze the processes and efficiency of each center and the possibility of integration. The team performed industry research on call centers standards and best practices, conducted in depth interviews with key points of contact at each center, and developed a three tier model for comparing the centers.

**Key Contributions and Recommendations**
The team recommends that Lockheed Martin continue to operate all four of the MS2 Help Desk operations. The four operations vary in size, call volume, clientele, operator technical knowledge, and call processing methodology. Due to these extensive differences, each center is vital to overall MS2 product support and development. The team further recommends that Lockheed Martin implement periodic meetings between the Help Desk management at each location to foster communication and knowledge sharing. This will enable continued awareness of the differences between the centers and the value each provides to MS2. The team has developed a possible agenda and discussion plan for such meetings based on our project methodology.

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**QUEST - Lockheed Martin Project**

**Help Desk Model Optimization**

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**Company Background**
Lockheed Martin Mission Systems & Sensors (MS2) division executes nearly 500 programs for US military, providing radar, surveillance system, and other advanced technology products. The four Help Desk centers are located in: Denver, New York, McLean, Virginia, and Tysons, Virginia.

**Opportunity**
Our team was provided with the opportunity to analyze the processes and efficiency of each help desk and the possibility of integration.

**Methodology**
Industry Research, Expert Interviews, Model Development

**Recommendations**
- Help Desk Conference Plan
  - "Call" center microstaffing
  - Lack of Communication
    - Voice mail, email, phone calls
    - Poor customer service
    - Inefficient systems and processes
- Business Impact
  - Built-in tool to aid the help desk operations
  - Identification of communication between the help desk operations
  - Development of communication frameworks to foster better communication between help desks
  - Increased efficiency and productivity

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**Acknowledgements**
- Mr. Rick Grandrino, Project Champion
- Mr. David Ashley, Faculty Advisor
- Jessica O'Keefe, B.S. Accounting, Expected May 2013
- Kristian Sooklal, B.S. Computer Science, Expected May 2013
- Alison Levin, B.S. Supply Chain Management, Expected May 2013
- Varisha Parikh, B.S. Bioengineering, Expected May 2013
- Steven Shumsky, B.S. Mechanical Engineering, Expected May 2013

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**QUEST Student Team:**

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<td>Jessica O'Keefe</td>
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**THE QUEST - SAIC (CYBERSECURITY) PROJECT**

**IMPROVING FIRST RESPONSE TO CYBERSECURITY THREATS**

**Organization Profile:**
SAIC is an industry-leading aerospace and defense contractor that deals with clients in both the public and private sector, primarily in the military defense industry. The company also offers solutions to various federal agencies and commercial clients in the cybersecurity, energy, health, intelligence, and logistics sectors.

**Department:** Cybersecurity Development Program  
**Project Champions:** Meghan Good, AVP, Project Manager, Cybersecurity Program Development Department  
**Faculty Advisor:** Dr. Neil Spring, Associate Professor, Computer Science, College of Computer, Mathematical and Natural Sciences

---

**Genna Gold**  
B.S. Mechanical Engineering  
Expected May 2013

**Bryan Huang**  
B.S. Finance  
B.S. Information Systems  
Expected May 2013

**Josh Kohn**  
B.S. Computer Science  
Expected May 2013

**Eddie Stose**  
B.S. Information Systems  
B.S. Supply Chain Management  
Expected May 2013

**Angela Wu**  
B.S. Fire Protection Engineering  
Expected May 2013

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**QUEST STUDENT TEAM: AEGIS SOLUTIONS**

**Project Abstract**
SAIC, a defense contractor historically focused on the federal sector, has begun to establish their market footprint in the commercial cybersecurity industry. SAIC feels that their current approach and timeline for responding to requests for proposals (RFP) - while competitive in the federal sector - will not be sufficient in the private realm. Aegis Solutions, in collaboration with SAIC’s forensic analytics team, has developed a pricing tool that will allow SAIC to give their clients a more accurate estimation of the price of their services in a shorter time, decreasing the overall time required to respond to proposal requests. Aegis Solutions has also made several recommendations for SAIC to implement in the future, including a staffing optimization system to ensure that all obligations to a client can be met, a predictive pricing analysis tool, and a web-based form for potential clients to fill out to facilitate the initial point of contact with SAIC.

**Key Contributions and Recommendations**
Our main contribution is a pricing tool to simplify the creation of estimates for proposals. It codifies a list of questions to ask when developing a proposal and uses programming to generate a report for management. In addition, we have drafted the following recommendations for future development: implementing an employee availability system to ensure that current and future staffing obligations can be met before undertaking a new project, and storing and analyzing pricing tool data to generate better cost estimates for the services offered by SAIC.

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**Improving First Response to Cybersecurity Threats**

**Team Aegis Solutions**

Genna Gold, B.S. Mechanical Engineering, Expected May 2013  
Bryan Huang, B.S. Finance and Information Systems, Expected May 2013  
Josh Kohn, B.S. Computer Science, Expected May 2012  
Eddie Stose, B.S. Information Systems and Supply Chain Management, Expected May 2013  
Angela Wu, B.S. Fire Protection Engineering, Expected May 2013

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**Project Champion:** Meghan Good  
AVP, Project Manager  
Cybersecurity Program Development

**Faculty Advisor:** Dr. Neil Spring  
Associate Professor  
UMD Computer Science Department
The QUEST - SAIC (Propaganda) Project
Auto-Identifying Propaganda in Social Media

Organization Profile:
Science Applications International Corporation (SAIC) is a FORTUNE 500 science, engineering, and technology applications company headquartered in McLean, Virginia. SAIC has over 45,000 employees and offers services in national security, energy and the environment, critical infrastructure, and health. SAIC is a leader in developing new technologies and solutions for defense and intelligence. Our project is a part of SAIC’s innovative research and development work with the intelligence community.

Department: Autonomy and Analytics (Intelligence, Surveillance, and Reconnaissance Business Unit)
Project Champion: Dr. Leora Morgenstern, Senior Scientist and Technical Fellow, Autonomy and Analytics
Faculty Advisor: Dr. James Purtilo, Associate Professor, Department of Computer Science, College of Computer Mathematical and Natural Sciences

Project Abstract
SAIC is developing automated methods to support analysts in the intelligence community. These analysts often need to detect ways in which propaganda is used to create unrest in foreign countries. The proliferation of social media vehicles like Facebook, Twitter, media blogs, and their foreign counterparts has resulted in a flood of materials that would be prohibitively time-consuming and expensive for human analysts to read. In response, SAIC is trying to solve this problem by developing automated tools to extract knowledge from text. Doing so would allow the intelligence community to accurately predict political unrest through social media and preemptively respond to diffuse the situation, saving not only time and money, but possibly human lives as well.

Key Contributions and Recommendations
Our team members researched existing identification methods in addition to suitable collections of propaganda in social media to create a classification structure (an ontology) to distinguish propaganda from non-propaganda texts. This ontology is intended to label portions of texts that can serve as training data for automated machine learning systems. Our team also developed a tool to measure inter-annotator agreement (IAA) between different analysts who annotate the aforementioned text. Because a high degree of IAA also indicates high efficacy of machine learning algorithms in categorizing documents, this tool should enable the development of effective methods to categorize social media documents according to their level of propaganda. In addition, we have suggested a set of metrics to measure the degree of IAA, and have provided a preliminary analysis of the IAA obtained using our recommended ontology. Our client plans to use this ontology in conjunction with natural language processing (NLP) and machine learning methods to develop software that will identify propaganda in new samples of social media.

QUEST Student Team: deTECHtion

Ben Bulka
B.S. Bioengineering
Expected May 2013

Justin Huang
B.S. Mathematics
B.A. Economics
Expected May 2013

Manas Kulkarni
B.S. Marketing
B.S. Operations Management
Expected May 2013

Brady O’Connell
B.S. Computer Science
Expected May 2013

Karen Qi
B.S. Accounting
B.S Supply Chain Management
Expected May 2013

Artem Shavdskiy
B.S. Computer Science
Expected May 2013

Auto-Detecting Propaganda in Social Media

Purpose
Main Goal
To quickly identify propaganda in order to preemptively ease political unrest.

Methodology

Why the gap?
Proliferation of media has made it time-consuming & expensive for humans to search all of the available data for propaganda.

Value of Machine Learning
Human Annotation would take 720,000 Person-Tweets/Day
Machine-Annotation would take 205,000 Person-Tweets/Day

480 Person-Tweets vs. 4 Minutes
$460,000 vs. $40/hr

Impact

Additional Value
Once we use our ontology to identify propaganda, we can filter out a network of propaganda. This will enable the identification of original propaganda sources.

Acknowledgments & Gratitude:
Dr. Laura Morgenstern
Dr. Jan Purtilo

The QUEST Program
University of Maryland

How we Meet Team deTECHtion

document annotation for training
inter-annotator agreement (IAA) measurement tool
natural language processing (NLP) and machine learning methods

Level 1

Level 2

Level 3

Level 4

Level 5

Level 6

Level 7

Level 8

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Level 100
THE QUEST - TEDCO Project
TEDCO Decision Making Process

Organization Profile:
TEDCO is a state funded technology development corporation that invests in early stage technology startups with the goal of driving economic development in the state of Maryland.

Project Champions: Robert A. Rosenbaum, President and Executive Director
Faculty Advisor: Dr. Nicole M. Coomber, Associate Director QUEST Honors Program, Lecturer of Management & Organization, Robert H. Smith School of Business

QUEST Student Team: Venturprise Solutions

Project Abstract
TEDCO is in the process of moving from an organization that focuses solely on economic development to one that seeks to generate a financial profit from some of its investments. In order to streamline this process, TEDCO sought to develop a decision making process that could better identify whether a potential investment fell into the sphere of either economic development or financial profit. To help TEDCO achieve this goal, our team came up with a set of short term and long term recommendations to optimize their investment process.

Key Contributions and Recommendations
Our recommendation comes in the form of three independent decision tools, which include a data sheet, consolidating key TEDCO data into a single, easy to use document, that provides a brief snapshot of TEDCO’s past investments and how they have fared, a meeting directive that provides key information about the fund-seeking company, professional reviews, and industry trends, and a system that uses linear regression to estimate the performance of future investments based on patterns in TEDCO’s past investments.
The QUEST - Tulkoff Food Products Project
Production Scheduling

Organization Profile:
Tulkoff Food Products Inc. is a food manufacturing company, specializing in horse radish and garlic based sauces. Tulkoff Food Products Inc. serves a wide range of customers through the packing, retail, food service, and industrial markets.

Department: Production Scheduling
Project Champions: Phil Tulkoff, CEO; Brent Guyton, Vice President of Operations
Faculty Advisor: Dr. Jeffrey Herrmann, Associate Director, QUEST Honors Program; Professor of Mechanical Engineering, A. James Clark School of Engineering

Quest Student Team: Speedy Spices

Project Abstract
Tulkoff Food Products presented the need for an increase in output per unit time (efficiency) of their production process. Specifically, the team was asked to look into the production scheduling process as a possible source for increased efficiency. For one of their manufacturing lines, the team worked to formulate a scheduling algorithm that would decrease the amount of overall changeovers, maximize run sizes, and ultimately accomplish the goal of increasing efficiency. Through situational research, statistical analysis, and trial runs, we were able to formulate a plan for improvement and move Tulkoff Food Products in the direction of increased efficiency for the future.

Key Contributions and Recommendations
Based on research, the team discovered that Tulkoff Food Products currently produces 47% of their maximum theoretical output. The team also found that the average number of daily changeovers was extremely high. From this data, the team was able to analyze the high moving SKUs that were responsible for 75% of overall production. This information led the team to develop an algorithm that would allow Tulkoff Food Products to focus on creating days in which the High Moving SKUS would be produced with greater run sizes, leading to a decrease in overall changeovers. The algorithm suggests two days a week that are dedicated to high moving SKUS. Also, the implementation of forward thinking in scheduling allows Tulkoff Food Inc. to use current open inventory capacity to allow for more efficient scheduling and use of the production lines.

I. Methodology
Taking a step back to look at why Tulkoff Food Products was experiencing low efficiency of their production line, the team was able to recognize opportunities to optimize the production scheduling process.

II. Recommendation
Using the insights from our scheduling test, the team proposed Tulkoff Food Products to implement a scheduling algorithm that is designed to minimize the number of daily changeovers and increase run sizes.

III. Implementation and Results
The Tulkoff Food Products production scheduler used the team’s algorithm to create a schedule that increased the utilization of the production line.

IV. Value to Client
Moving forward, Tulkoff Food Products will gain value from our algorithm in quantitative and qualitative manners.

Efficiency Through Improved Scheduling
Increasing the Efficiency of the Production Line at Tulkoff Food Products
QUEST Faculty and Leadership

David Ashley
Executive in Residence, QUEST Honors Program
Robert H. Smith School Of Business
Projects Advised: Middle River Aircraft Systems (Design Process), Lockheed Martin

David Ashley is an adjunct professor and an Executive in Residence at the University of Maryland Smith School of Business. He is also a program analyst for the Federal Emergency Management Agency (FEMA) within the Department of Homeland Security where his duties involve developing business models, performance measurement and survey work, and program management and program reviews. Before FEMA, Professor Ashley served as a Financial Resource Manager with the Department of Homeland Security, Customs and Border Protection (CBP). His duties involved managing a $200M budget including its formulation and execution. Additionally, he oversaw performance measurement and analysis, survey research, and strategic planning for CBP. Previous to his DHS assignment, he worked for the U.S. Small Business Administration (SBA) where he led various marketing research efforts including the SBA’s branding campaign. Professor Ashley also served as the director of the Small Business Development Center at the University of New Mexico overseeing the Center’s operation including formulating business and marketing plans for area businesses as well as assembling business loan packages. He served as president of the University of Georgia’s Marketing Research Institute International and he served two terms as president of the Mid-Atlantic Chapter of the Marketing Research Association. He has published in Quirks Marketing Research Review and has published instructor ancillary materials for various marketing, marketing research, and economics textbooks for Wiley Publishing. Finally, Professor Ashley has just authored a marketing research college textbook though Kendall Hunt Publishing. He holds an undergraduate degree from the University of North Carolina and a graduate degree from the University of New Mexico.

Melanie N. Ashton
Program Manager, QUEST Honors Program

Melanie Ashton currently serves as the QUEST Program Manager. Since coming to QUEST, she remains highly involved with the strategic implementation of extracurricular programming for students. Melanie serves as the student affairs counselor, student organization advisor, and events coordinator. Melanie teaches the QUEST Mentoring Practicum course and leads the selections and interview process for new students to the community. Prior to joining QUEST, Melanie worked as an Assistant Manager in Smith’s Domestic and International EMBA Programs where she organized student trips for our international EMBA students to come to our College Park campus. In this role, she served as a student advisor and faculty liaison, and coordinated EMBA activities with our partners in China, Switzerland, and Tunisia. Prior to that, Melanie was Program Coordinator in the office of Executive Education. Additionally, she brings experience as Special Education Coordinator in the Extended School Year Program for Montgomery County Public Schools. She holds a Bachelor’s Degree in Psychology from the University of Maryland College Park.

Dr. Joseph P. Bailey
Executive Director, QUEST Honors Program
Research Associate Professor of Decisions, Operations & Information Technologies
Robert H. Smith School of Business

Dr. Joseph P. Bailey is the QUEST Executive Director and a Research Associate Professor at the Robert H. Smith School of Business. He has been a faculty member at the University of Maryland since 1998. In addition to teaching the capstone course in the QUEST program, Dr. Bailey also teaches the QUEST sophomore course on innovation and design and an MBA course on managing digital markets. His research focuses on Internet commerce and digital platform competition. Dr. Bailey’s research has impacted company strategy and public policy beyond his scholarly publications. Additionally, he has worked with multiple companies including Amazon.com, AutoTrader.com, eBags, eHarmony, Home Depot, Match.com, SAIC, and Staples. Dr. Bailey’s research has also lead to interactions with international organizations and government agencies including the Federal Communications Commission, National Science Foundation, OECD, U.S. Patent and Trademark Office, and the U.S. Postal Service. Dr. Bailey completed his Ph.D. in June 1998 in the Technology, Management and Policy Program at MIT—an interdisciplinary program combining technical, economic, and business analyses for integrated research. His interdisciplinary work originates from a technical/economic background. He received his B.S. in Electrical Engineering and Engineering and Public Policy from Carnegie Mellon University in 1992 and his M.S. in Engineering-Economic Systems from Stanford University in 1993.
**QUEST Faculty and Leadership, Continued**

**Dr. Nicole M. Coomber**  
**Lecturer of Management & Organization**  
**Associate Director, QUEST Honors Program**  
**Project Advised: TEDCO And Bowles Fluidics**

Dr. Nicole M. Coomber is the Associate Director for the QUEST Honors Program and on the faculty in the Management & Organization area at the Robert H. Smith School of Business. As Associate Director, Dr. Coomber serves as Managing Director for the QUEST entrepreneurship program, QUESTgen, is one of the teaching team for BMGT/ENES 490H, and aids in QUEST’s efforts in designing learning outcomes and assessments. Dr. Coomber completed her PhD in Education Policy and Leadership in May of 2012 at the University of Maryland’s College of Education. Her research interests include leadership, team dynamics, and experiential learning. Dr. Coomber teaches a variety of courses outside of QUEST, including Managing People and Organizations, Leadership in Action, Non-Profit Consulting, and Cross-Cultural Challenges in Business. Before joining the faculty at Smith, she worked with the QUEST program as Assistant Director, leading efforts in curriculum and corporate development.

**Dr. Thomas M. Corsi**  
**Michelle E. Smith Professor of Logistics**  
**Co-Director, Supply Chain Management Center**  
**Robert H. Smith School of Business**  
**Project Advised: ATK Defense Group (Complete Compliance)**

Dr. Thomas M. Corsi joined the Smith School in 1976 as a Professor of Logistics and Transportation. He is an associate editor of the Logistics and Transportation Review and the Journal of Business Logistics. He serves on the editorial review board of the Transportation Journal and the International Journal of Physical Distribution and Logistics Management. He has authored more than 100 articles on logistics and transportation. He has consulted for such organizations as the Interstate Commerce Commission, the Maryland State Department of Transportation, the National Science Foundation, the Federal Motor Carrier Safety Administration of the United States Department of Transportation, the National Truck Stop Operators, United Parcel Service, the United States Department of Energy, and the U.S. Army Logistics Agency. He has co-authored four books entitled: *The Economic Effects of Surface Freight Deregulation*, published in 1990 by the Brookings Institution in Washington, D.C.; *Logistics and the Extended Enterprise ( Benchmarks and Best Practices for the Manufacturing Professional)*, published in 1999 by John Wiley & Sons in New York City; *In Real Time: Managing the New Supply Chain*, published in 2004 by Praeger Books; and *X-SCM: The New Science of X-treme Supply Chain Management*, 2010 by Routledge Press. In 2001, Dr. Corsi was appointed the Michelle E. Smith Professor of Logistics.

**Kylie Goodell**  
**Assistant Director, QUEST Honors Program**

Kylie Goodell serves as assistant director of QUEST. In this role, she manages QUEST’s corporate relationships, securing support for capstone projects, sponsored events, and academic retreats. Kylie also leads alumni engagement efforts and serves as an ex-officio member of the QUEST Alumni Board. Kylie is involved with program marketing, corporate and individual giving, and the assessment of learning outcomes. She teaches a QUEST course on developing business relationships and scoping the consulting project. Previously, Kylie served as QUEST’s graduate assistant while earning her MA in Higher Education at the University of Maryland. Before joining QUEST, she received a B.S. in Industrial and Systems Engineering from North Carolina State University and worked as an Industrial Engineer in the Tyco Electronics Leadership Development Program. Kylie’s research interests include evaluating admission metrics and outcomes of high-achieving student programs.
QUEST Faculty and Leadership, Continued

Dr. Keith Herold  
Associate Professor, Fischell Department of Bioengineering  
A. James Clark School of Engineering  
Project Advised: BD

Associate Professor Keith Herold joined the University of Maryland’s Department of Mechanical Engineering in 1987, where his research focused on energy systems and absorption refrigeration. In 2000, he shifted his focus to bioengineering and began exploring biosensors, microarrays, and related lab-on-a-chip technologies. In 2006 he joined the newly formed Fischell Department of Bioengineering, where his work in these areas continues. His current research projects include collaborations with Canon Corp. and the FDA on a DNA-based pathogen biosensor, and with electrophysiologists at the University of Maryland School of Medicine on the analysis of patients suffering from ventricular tachycardia.

His research interests include BioMEMS, microfluidic systems for bioanalytical assays, heat and mass transfer in bioengineering.

Dr. Jeffrey W. Herrmann  
Associate Professor, QUEST Associate Director  
Department of Mechanical Engineering  
and Institute for Systems Research  
A. James Clark School of Engineering  
Project Advised: Middle River Aircraft Systems (Aircraft Manufacturing) & Tulkoff Food Products

Jeffrey W. Herrmann is an associate professor at the University of Maryland, where he holds a joint appointment with the Department of Mechanical Engineering and the Institute for Systems Research. Dr. Herrmann earned his B.S. in applied mathematics from Georgia Institute of Technology. As a National Science Foundation Graduate Research Fellow from 1990 to 1993, he received his Ph.D. in industrial and systems engineering from the University of Florida. His dissertation investigated production scheduling problems motivated by semiconductor manufacturing. He held a post-doctoral research position in the Institute for Systems Research from 1993 to 1995. His current research interests include operations research for homeland security and emergency preparedness, production scheduling, and improving decision-making processes.

Dr. Hassan Ibrahim  
Distinguished Tyser Teaching Fellow  
Department of Decisions, Operations and Information Technologies  
Robert H. Smith School of Business  
Project Advised: Bakery Express

Dr. Hassan Ibrahim is a Distinguished Tyser Teaching Fellow at the Robert H Smith School of Business. Dr. Ibrahim received D.Sc. and Master degrees in Engineering Management from The George Washington University. He also has Bachelor degree in Electrical Engineering. Dr. Ibrahim areas of specializations are Project Management, Information Systems development, and Operations Management.

Dr. Ibrahim’s research was published by Harvard Business School and the Production and Inventory Control Journal. Ibrahim served on the Editorial Review Board of the Journal of Operations Management. His primary teaching areas are: systems analysis and design, data communications, and operations management. He was nominated for the Outstanding Scholar of the Year Award in the Commonwealth of Virginia in 1996. He has worked for and consulted with a number of industry leaders including the World Bank, McDonnell Douglas, Phillips Electronics, and Siemens Medical Systems.
**QUEST Faculty and Leadership, Continued**

**Dr. James Purtilo**  
**Associate Professor, Computer Science Department**  
**College of Computer, Mathematical, and Natural Sciences**  
**Project Advised: SAIC (Propaganda)**

Dr. James Purtilo specializes in software development and product assurance, and his research is currently funded by the Office of Naval Research on a cyber security systems project. With prior support from the National Science Foundation, Department of Defense Advanced Research Projects Agency and various corporate sources, Purtilo has studied and published on topics of software producibility, formal methods, rapid prototyping and testing. Purtilo has served on the Defense Biometric Support Team (an advisory group to the Office of the Secretary of Defense), is a member of the Arrhythmia and Cardiology Imaging Group at the UM Medical Center in Baltimore, and has consulted with the Division of Civil Rights within the Department of Justice. At the University of Maryland, he has served as the Associate Dean for Undergraduate Education in the College of Computer, Mathematical and Physical Sciences, chaired the undergraduate Computer Science program and directed the Master’s of Software Engineering Program. He received his Ph.D. in Computer Science from the University of Illinois at Urbana in 1986.

**Dr. J. Gerald Suarez**  
**Lockheed Martin Visiting Technical Fellow**  
**Professor of Practice of Practice in Systems Thinking and Design**  
**Robert H. Smith School of Business**  
**Project Advised: ATK Defense Group (Mergers & Acquisitions)**

J. Gerald Suarez was named Associate Dean of External Strategy for the Smith School in 2008. In this role, Suarez oversees Smith’s Offices of Career Management, Recruiting and Marketing Communications. In 2005, he joined the Smith School as an Executive Education Senior Fellow, Ralph J. Tyser Teaching Fellow for the Decision, Operations and Information Technology Department, and Executive Director of the Quality Enhancement Systems and Teams (QUEST) Honors Fellows program. In 2008 he received the prestigious Allen J. Krowe teaching excellence award.

He has taught at the corporate, executive MBA, full-time MBA, international, and undergraduate levels and has served as academic director for executive on-site programs at Lockheed Martin Corporation and Scientific Applications International Corporation (SAIC). In 2009, Dr. Suarez became a Visiting Fellow for Lockheed Martin Corporation. Prior to joining the Smith School, Suarez served under two administrations in the White House as the Director of Presidential Quality -- the first such post in the institution’s history.

**Dr. Neil Spring**  
**Tyser Teaching Fellow**  
**Logistics, Business and Public Policy**  
**Robert H. Smith School of Business**  
**Project Advised: SAIC (Cybersecurity)**

Neil Spring received his Ph.D. at the University of Washington in 2004 and B.S. in Computer Engineering from the University of California, San Diego in 1997. His research interests include software support for online social networks, wireless protocols for energy conservation, network topology discovery, and operating system support for networking.
**About QUEST**

Quality Enhancement Systems and Teams (QUEST) is a multidisciplinary engineering, technology and management program at the University of Maryland. Students participate in a challenging course of study that focuses on quality management, process improvement, and system design. Funded in 1993 by a grant from IBM to establish total quality on university campuses, the University of Maryland has continued the program which has produced excellent graduates prepared to face the changing landscape of business, engineering, and technology.

**Collaboration & Team Work**

In each QUEST course, students work in cross-functional teams on action learning projects. The team based and multidisciplinary format of the curriculum provides students with experience in team dynamics, allows collaboration between individuals of diverse skill sets and talents, and inspires an environment for collaborating on ideas and tactical strategies.

**Community of Learning**

QUEST is a community of learning – all members contribute to and benefit from the interactions and lessons learned. The community includes students, faculty and staff, alumni, professional partners and University colleagues. This dynamic combination provides a broad field of shared learning experiences, networks, sponsorship and project opportunities, and a unique program structure.

**Multidisciplinary Focus**

QUEST students represent majors within three colleges of the University:

- A. James Clark School of Engineering
- College of Computer, Mathematical and Natural Sciences
- Robert H. Smith School of Business

QUEST students share and develop their organizational and technology acumen while increasing their understanding of how these industries are interdependent in the professional field.

**Action Learning**

QUEST courses go beyond the walls of the university by inviting in corporate guest speakers and allowing students to apply course lessons to real-world challenges. Students learn to apply principles of quality management, process improvement and system design to meet the needs of customers and users. As seniors, student teams work on problems defined by corporate, government, and non-profit organizations, learn about the consulting process, and provide recommendations.

**Join the Learning Community**

QUEST partners are individuals and organizations who engage in and contribute to learning programs, projects and initiatives. Partners interact with the students, staff and faculty in a variety of forums resulting in value-added exchanges of knowledge and ideas. Partners are engaged in:

- Receiving consulting services
- Sponsoring Integrating QUEST (IQ) events, initiatives and visits to their organizations
- Sponsoring the QUEST Senior Conference

QUEST partners gain exposure for recruiting students to internship, co-op and full-time positions and benefit from a heightened presence at the university level.

To join us, please share your business card with a staff member or contact us at:

**QUEST Honors Program**

3335 Van Munching Hall
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College Park, MD 20742
FORMER QUEST PROJECTS OF THE YEAR (2008-2011)

2011: THE QUEST – SAIC MACHINE READING PROJECT

PROJECT: A.I. PREDICTION OF FINANCIAL CRISIS

Shiran Beroukhim
Jason Felder
Jeff Jacobs
Ryan Murphy
Avi Prince

2010: THE QUEST – TULKOFF FOOD PRODUCTS PROJECT

PROJECT: WASTE REDUCTION & WATER TREATMENT OPTIMIZATION

Jeffrey Lue
Yasmeen Thomé
Augusto Tono
Melanie Wong
Jesse Wu

2009: THE QUEST - LOCKHEED MARTIN (OCEAN WAVE) PROJECT

Project: Deployment of Ocean Wave Power-Generating Buoy Farms

Suehyun Cho
Munaf Kachwala
Abhishek Kumar
Abby Widom
Gary Wu

2008 (TIE): THE QUEST – WINCHESTER HOMES PROJECT

PROJECT: SUSTAINABLE SOLUTIONS FOR CONSTRUCTION WASTE MANAGEMENT

Brad Eisenberg
Tracey Epstein
Sean Kirk
Mary Larson

2008 (TIE): THE QUEST – UKRAINIAN YOUTH PROJECT

PROJECT: SHUTTERS4SCHOLARS

Ianina Jmourko
Alexandra Petrenko
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**QUEST Sponsors 2012**

The QUEST Honors Program at the University of Maryland thanks all of its sponsors. Sponsorship of many different kinds makes our action learning curriculum possible. Thanks to the support of the companies listed below, we are able to deliver outstanding learning opportunities to our talented students.

**Project Sponsors**
The companies below have made a significant contribution our QUEST Seniors as they complete their capstone learning project. In addition to a financial contribution, these sponsors have given an enormous amount of time and thought leadership to a team of students.

- ATK Defense Group*
- Middle River Aircraft Systems*
- Tulkoff Food Products
- BD
- Lockheed Martin
- TEDCO
- Bowles Fluidics
- SAIC*

* Two Projects

**Conference Sponsors**
The companies below have made a significant contribution to our QUEST Senior Conference. Thanks to their financial support, our QUEST Seniors have been given the opportunity to professionally present their projects and our QUEST community has been given the chance to celebrate their accomplishments.

- ATK Defense Group
- PwC
- SAIC

**Other Support**
In addition to our signature sponsors, the companies below have contributed to the learning of our QUEST Seniors in a variety of ways including our classroom visits and co-curricular activities.

- Accenture
- Deloitte
- IBM

**Thank You!**
QUEST would like to thank and acknowledge all of the individuals, committees, and organizations who have contributed to helping honor and celebrate student achievement at this event.

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2012-2013

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