ATK (Complete Compliance)

Team Rock-It Presents: Complete Compliance
Process Improvements to Reduce and Eliminate Paperwork Noncompliance

Opportunity
Current State:
When working with federal contracts, ATK requires its vendors to fill out Quality Assurance Provisions (QAPs) for any parts they purchase. Each year there are hundreds of paperwork noncompliance issues at ATK's facilities. ATK wastes man-hours correcting these noncompliances and sometimes incurs schedule delays while parts are waiting for paperwork.

Opportunity:
- Develop process improvement recommendations to facilitate vendor compliance by addressing the most common issues vendors face.
- Reduce the frequency of products arriving with paperwork noncompliances by 50%.

Methodology
- Identify Project Scope and Stakeholders
- Measure Data and Interview Buyers/Vendors
- Analyze Causes of Noncompliance
- Optimize Final Solution

15% Product Noncompliance

The QAPs are lengthy and extracting the necessary information requires significant effort.

Vendors do not always have the most up-to-date quality provisions saved locally.

The Quality Assurance Provisions (QAPs) are difficult to locate online.

Meet the Team
- Michael Hamilton
  - B.S. Aerospace Engineering
- Nathan Elmore
  - B.S. Mechanical Engineering
- Christopher Bilger
  - B.S. Mechanical Engineering
- Birthday Brewer
  - Project Champion
- Jacob Steuer
  - B.S. Supply Chain Management
- Ethan Shapir
  - B.S. Marketing
- Dr. Cori
  - Faculty Advisor

Recommendations
- Online Quality Assurance Provision (QAP) Database and Information Generator
- Hosted by ATK on their company website
- Link provided to vendors on purchase orders
- Check boxes to enter QAPs required by PO
- Compile a list of only the QAPs necessary
- Generate a QAP checklist to simplify the process
- Clarifies responsibilities in 1-2 sentences per QAP

Quality Assurance Provision (QAP) Checklist
- Includes information required by QAPs on a certificate of compliance
- Explains which QAPs require an agreement between the vendor and ATK
- Details any other QAP responsibilities the vendor may incur by agreeing to terms with ATK
- Informs the vendor that if a QAP cannot be met, send ATK notification and reasoning

Cost Benefit Analysis
- A noncompliance costs ATK -1 man-hour (best case scenario) and up to hundreds if schedule delays occur.
- The cost benefit analysis assumes minimum man-hour losses per noncompliance and accounts for the initial cost to implement the system.
- Red line – New system
- Blue line – Current system
ATK (Mergers and Acquisitions)

Driving Efficiency in M&A Valuation Procedures

ABACUS

Opportunity
To provide our client with an effective decision-making tool that delivers financial valuation information quickly, efficiently, and intuitively.

Methodology
Issue Framing  
Research  
Model Development  
Final Product

ABACUS
Streamlined  
Intuitive  
Integrated  
Effective

1. Financial Statements
The Balance Sheet and Income Statements are downloaded from a Bloomberg terminal and pasted into a template in Abacuss. The final statements are automatically transformed into pro forma statements in separate tabs.

2. Alter Ratios
The ratios tab enables the user to alter values going forward based on qualitative factors that Abacuss quantifies in the DCF.

3. DCF & Sensitivity Analysis
Abacuss data output provides graphical representation of various financial metrics.

4. Data Output
Abacuss data output provides graphical representation of various financial metrics.

Acknowledgements
Santiago Mirel, Materials Engineering (2013)
Malinda Song, Finance & Accounting (2013)
Diony Wagner, Finance & Accounting (2013)
Amy Kalowitz, Bioengineering (2013)
Mathew Gold, Finance (2013)

Project Champion
Kurt McIntyre, ATK
Faculty Advisor
Dr. Gerald Suarez
Contributors
Quality Guild
Profil Dashed
Bakery Express

Paperless Inventory

A. Scope
To assess the current inventory management system specifically receiving, storage and scaling and then provide recommendations on ways to improve the system.

B. Define, Measure & Analyze
- Define: Analyze initial list of 75 potential suppliers and manufacturers
- Measure: Quantify order to obtain metrics
- Analyze: Reviewing supplier metrics

C. Process Flow Diagram
- Fungi Process: Order tracked
- Product Flow: Order checked against expected list
- Materials Flow: Loaded into cold storage system
- Multiple Flow: Order marked on receiving log
- Processing Flow: Materials checked out via clipboard
- Materials Flow: Loaded into dry storage system
- Updates Flow: Material used and returned are matched to items in progress

D. System Selection
- 24 Starting Systems
  - Ranked by Flexibility (20%), Usability (25%), Customer Service Support (5%) & Requirements (50%)
- 6 Qualified Systems
  - Narrowed down by Client based on fees to try & requirements
- 3 Preferred Systems
  - On-line personalized demos presented to client
- 1 Final System:
  - Fishbowl

E. Fishbowl Attributes
- Multiple Warehouse Tracking
- Quickbooks
- Wired and Wireless
- Centralized Data Management
- Barcode Inventory Tracking System
- Additional Features

F. Value Added: Cost vs. Benefit Analysis
- Cost
  - $10,700 for 3-5 users
  - $3495 for Fishbowl Mobile
  - $1,095 each handheld scanner X5105
- Benefit
  - Improved Data Legibility, Reliability, Accessibility & Reusability
  - Improved Systems
  - Increased Operational Efficiency
  - Time Saved

Project Champion:
Mr. Jon Burns
Assoc. Gen. Manager
Ms. Barbara Berry
Faculty Advisor:
Dr. Hassan Ibrahim
Dept. of Decision, Operations, and Information Technologies

Chetall Gupta
Chemical Engineering
Jared Ruff
Accounting & Supply Chain Management
Moses Lahey
Information Systems & Operations Management
Nicole Dannewer
Marketing & Operations Management
Vikram Bhandari
Computer Science
BD

KIE SOLUTIONS
Presenting the Future of Lab Automation

CLIENT BACKGROUND
Becton Dickinson 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.

OPPORTUNITY
As part of BD’s move towards total lab automation, we were tasked with automating the blood cultures process from specimen arrival to disposal or further subculture using the current BACTEC FX system as a foundation.

METHODOLOGY
After collecting quantitative and qualitative voice of the customer data from a survey and personal site visit to a microbiology lab (WHC), we began applying BD customer preferences to our preliminary sketches. These sketches were presented to the BD team, then modified to better reflect the voice of the business.

ANALYSIS
The survey results indicated the importance of automation of the following features. Each component of our concept for full automation was designed to reflect the wants and needs of microbiology labs that currently use the BACTEC FX system.

RECOMMENDATION
Our final design, the BACTEC MFX, is a fully automated version of the current BACTEC FX system. The design only requires a technician to be present for test sample drop-off and positive sample pick-up. Please see below for our recommendation.
Bowles Fluidics

Strategies for Paperless Manufacturing
Bowles Fluidics Corporation

OPPORTUNITY
Scope: Provide recommendations for Bowles to go paperless on the manufacturing floor of their Columbia, Maryland facility.
Impact: Reduce 500-1000 pages per day and increase worker productivity.

Return on Investment:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Cost</th>
<th>Savings</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>$15,000</td>
<td>$4,500</td>
<td>30%</td>
</tr>
<tr>
<td>Non-Paper</td>
<td>$8,000</td>
<td>$2,500</td>
<td>31%</td>
</tr>
<tr>
<td>Software</td>
<td>$5,000</td>
<td>$1,500</td>
<td>30%</td>
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</table>

ROI Calculation:

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<thead>
<tr>
<th>ROI</th>
<th>Payback</th>
<th>Future Years</th>
<th>Total Savings</th>
<th>Return on Investment</th>
<th>Payback Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>14 years</td>
<td>10 years</td>
<td>$38,000</td>
<td>$24,800</td>
<td>15 years</td>
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</table>

METHODOLOGY

Weighted Criteria Grid

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Cost</th>
<th>Design Potential</th>
<th>Reusability</th>
<th>Software</th>
<th>Conductivity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Nexus</td>
<td>30</td>
<td>15</td>
<td>5</td>
<td>40</td>
<td>10</td>
<td>380</td>
</tr>
<tr>
<td>Tablet A</td>
<td>55</td>
<td>10</td>
<td>5</td>
<td>30</td>
<td>10</td>
<td>305</td>
</tr>
<tr>
<td>Tablet B</td>
<td>45</td>
<td>5</td>
<td>5</td>
<td>40</td>
<td>0</td>
<td>280</td>
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</tbody>
</table>

Weighted Scoring:

<table>
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<tr>
<th>Google Nexus</th>
<th>Tablet A</th>
<th>Tablet B</th>
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</thead>
<tbody>
<tr>
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<td>40</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

Process:

Documentation of Current Process
- Develop Requirements
- Idea to Brainstorm Solutions
- Narrow and Refine Solutions
- Final Recommendations

Swimlane Diagram:

Old: 10 lane changes
New: 4 lane changes

RECOMMENDATIONS

Hardware
- 4 Google Nexus Tablets
- 7" for easy handling
- Cost effectiveness
- Compatibility
- Docksability
- Battery life
- Docking stations

Software
- INTELEX
- Convert paper documents into online forms
- Accessible on computers, tablets, and mobile devices

IMPLEMENTATION

1. Implementation
2. Plans for Management
3. Risk Mitigation Strategies

Acknowledgements

Project Champion: Julian Bryan
Facility Manager: Donnie Beaven
Design Engineer: Seth Smith
Mechanical Engineer: Seth Smith
Software Engineer: Sashi Wu
Acknowledgments: Bowles Fluidics Employees

Quest Fluidics Emotions: Bowles Fluidics

Friends and Family: Thank you for supporting us.
Lockheed Martin

Company Background
Lockheed Martin Mission Systems and Sensors (MSS) division executes nearly 500 programs for diverse clients. MSS currently operates four help desk centers for product and technical company support. The four help desks are located in Owego, New York; Moorestown, New Jersey; Manassas, Virginia; and Syracuse, New York.

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
Due to their unique qualities and functions, Lockheed Martin should continue to operate all four help desks.

1st Tier
- There are no pervasive similarities besides the fundamental answering of calls.

2nd Tier
- There are several differentiating factors between command and call centers, including technical knowledge of employees & necessity for product proximity.

3rd Tier
- There are fundamental size, process, and climate differences in each help desk.

Help Desk Conference Plan
"Call" Center Misconceptions
- Fear of Change
- Lack of Communication

Help Desk Conference Plan
- Geographic Spread
- Process Variations

Who?
- What?
- Where?
- When?
- Why?

Business Impact
Built 3 tier model to clarify the help desk classifications.
- Opened lines of communication between the help desk operations.
- Developed framework for help desk conference to promote internal communication.
- Identified detrimental effects consolidation would have on customer service.
- Provided upper level MSS management with greater understanding of help desk operations and value.
MRAS (Aircraft Manufacturing)

To assist MRAS in designing a layup room for a new facility to have optimal production capacity with limited space and time for production. To be implemented in January 2013.

Data & Analysis

Number of Cells:

\[
\text{\# of parts} \times \frac{\text{work cell time}}{\text{work month hours}}
\]

约束

Safety
Time
Size

Recommendation

1. Capacity Analysis
2. Constraint Analysis
3. Improved Layouts
4. Implementation Plan

The Innovation:

Our Impact:

- Enhanced workflow
- Greater Efficiency
- Optimized layout

Thanks to:

- Project Chairman: David Weisberg
- Project Manager at MRAS: Faculty Advisor
- Dr. Jeffrey Warnsman
- Associate Professor of Mechanical Engineering

Greg Barr
Jessie Gonzalez
Baku Hei
Gail Iron
Brian Lebowitz

B.S. in Mechanical Engineering
B.S. in Mechanical Engineering
B.S. in Operations Management
B.S. in Accounting
B.S. in Computer Science
B.S. in Chemical Engineering
MRAS (Design Process)

Streamlining the Design Process: G.E. at Middle River Aircraft Systems

Context
- Middle River specializes in the design of Nacelles.
- General Electric Acquires Middle River Aircraft Systems leads to a culture shift:
  - Influx of work
  - Increase in new designers
  - “Tribal knowledge” difficult to communicate
  - Tribal knowledge: The design process resident to each person but not concretely defined.
  - The combination of this culture shift and undefined design process makes it difficult to manage three projects.

Methodology
Through interviews and discussions with employees from Middle River each working on different projects, we obtained different perspectives on current state of process and found commonalities among interviews to narrow in on a solution for a more efficient design process.

Analysis

Recommendations

Project Scope
Optimize the engineering design process at GE-Middle River by implementing quality tools and lean six sigma methodologies.

Utilization of Checklist
- Checklist aids as a medium of communication between designers and upper level management.
- Checklist also can serve as a process management tool and will provide quantifiable data for future analysis.
- Broken down into manageable sub-sections based on part family.

Implement formal training for new designers
- Orientation with packets including design process template and common rules of thumb.
- Optional mentoring program matching up new designers with experienced designers in same department.
- Checklist used as a continual training method allowing designers questions to be answered by other designers or management.

Project Champion: Chris Sanford
Faculty Advisor: David Ashley

Brendan Fennessy B.S.E.E. ’12  William Dunham B.S.M.E. ’13
Jay Vogel B.S.E.E. ’13  Michael Poiter B.S.M.E. ’13
Trevor Skibbens B.S.C.E. ’13
SAIC (Cybersecurity)

Improving First Response to Cybersecurity Threats

**PROJECT OPPORTUNITY**
In response to rising cybercrime in corporate America, SAIC has recently expanded their cybersecurity services to the commercial sector.

SAIC has asked Team Aegis Solutions to improve their threat response process and develop a pricing tool to provide a cost estimate for their cybersecurity services.

**PRICING TOOL**
Assists proposal development by helping users:
- Ask the right questions
- Choose the appropriate service offerings

**PRIMARY RECOMMENDATION**
Leverage Existing Knowledge to Create Better Estimates

**SECONDARY RECOMMENDATION**
Implement the following employee availability system to ensure that current and future staffing obligations can be met before undertaking a new project:

**PROJECT VALUE**
- Improving Accuracy
- Saving Time
- Winning More Business

**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 2013
- Eddie Stice, B.S. Information Systems and Supply Chain Management, Expected May 2013
- Angela Wu, B.S. Fire Protection Engineering, Expected May 2013

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

Faculty Advisor: Dr. Neil Spring
Associate Professor
UMD Computer Science Department
SAIC (Propaganda)

Auto-Detecting Propaganda in Social Media

**Purpose**

**Main Goal**

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

Why the gap?

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

**Example:** Arab Spring

The Arab World’s democratic movement.

Value of Machine Learning

Human Annotation would take

230,000 Tweets/Day

3 Minutes/Tweet

480 Person-Days

$480,000

480 days x $40/hr = $460,000

Machine Annotation would take

230,000 Tweets/Day

0.001 Seconds/Tweet

4 Minutes

**Methodology**

We created an Ontology

That is Used by

Annotators

To Mark

Documents

And Generate

Annotations

Which Are Used to Train

Social Media

And Detect

Propaganda

**Impact**

Propaganda Ontology

Classification structure that allows us to characterize documents by propaganda elements.

Inter-Annotator Agreement (IAA) Measurement Tool

We created a tool to compare the inter-rater agreement between annotators using the same, identical documents to measure inter-annotator agreement.

**NOTE:** High agreement indicates an effective ontology and is predictive of strong machine learning results.

**IAA Test Results**

41%-67% Agreement

This range of agreement applies to documents that were both written in Arabic English and extremely long.

**Additional Value**

Once we use our ontology to identify propaganda, we can then map a network of propagandists. This will enable the identification of original propaganda sources.
What is TEDCO?

- Founded in 1996, TEDCO is a state-funded investment corporation that invests in Maryland-based technology startups with the goal of driving economic development in Maryland.
- Recently, TEDCO has launched a set of efforts aimed at turning a profit. Right: A pie chart shows the status of TEDCO's investments.

Opportunity

As TEDCO makes these transitions, how to measure a company's potential economic development value for Maryland versus the potential financial return to TEDCO has arisen as an important question. Over the past semester, Venturprise Solutions had the opportunity to answer that question while simultaneously seeking ways to help improve TEDCO's efficiency and decision-making process.

Methodology

Quantitative Research
- In-depth analysis of TEDCO's data
- Secondary: Publications

GAP Analysis
- Exploration of how gaps between TEDCO's current and desired states should be filled.

Project Deliverables

Consolidation
- A consolidated spreadsheet containing all TEDCO TCF investments and how those companies have fared regarding both economic development and financial return.
- A dashboard that produces valuable plots and statistics based on the economic and financial data.

Focus

- A meeting directive to be used as reference by panel members during the final review presentation.
- Details the specific requirements of the fund for which the presenting company is applying.
- Contains important data from the technical review, business review, and how similar TEDCO investments have fared.

Perspective

- A regression analysis that searches for statistical patterns and relationships between the companies' characteristics, TEDCO reviewer ratings, and the outcome of the investments.
- Estimates the future performance of current applicants in terms of measurable economic development and financial return data.
- Answers TEDCO's questions regarding decision making while at the same time adding a quantitative aspect to the process.

Venturprise Solutions

(from left) Max Shrier, Wen-yue Wu, Audrey Morris, Brett Schwab, & Daniel Choquette

Project Champion: Faculty Advisor:
Rob Rosenbaum Dr. Nolite Coomer
President - TEDCO Associate Director - QUEST Honors Program
Tulkoff Food Products

**Efficiency Through Improved Scheduling**
Increasing the Efficiency of the Production Line at Tulkoff Food Products

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

**MOVING FROM DATA TO ACTION**

**TULKOFF FOOD PRODUCTS, INC.**

Tulkoff Food Products, Inc., a third-generation family-owned food manufacturing company best known for their homestyle and garlic-based products. Tulkoff serves a wide range of customers through the packing, retail, food service, and industrial markets.

**OCCUPANCY**
To optimize the scheduling process and gain a measurable improvement in production efficiency.

**II. Recommendation**
Using the strategies from our rescheduling test, the team presented Tulkoff Food Products with 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 quantifiable and useful measures.

**IMPLEMENT AND RECOGNIZE VALUE**

**Team Speedy Spices**
Shirley Qin
Rebecca Brown
David Rosen
Nicholas Yanoji

Project Champion: PH: Tulkoff
Project Champion: Brent Gayton
Faculty Advisor: Dr. J. Herrmann
Acknowledgments: Dr. J. Bailey, Dr. N. Coomber, David Ashley, Brett Jacobs, Terence Devlaine