

INTRODUCTION

The Acceleration Resources and Knowledge Challenge (“the ARK”) is a bootcamp intended to assist entrepreneurs with high-potential technology companies with focus around three specific clusters: (1) retail, (2) transportation and logistics, and (3) food processing. The bootcamp will be a 14-week program intended to provide entrepreneurs with mentorship, training, seed capital, and customer access around developing information technology ventures that solve important technical problems for the aforementioned clusters. The first bootcamp will recruit up to 45 people, representing 15 entrepreneurial ventures. A selection process will occur to choose entrepreneurs who provide innovation within the ARK clusters and have the potential to create a venture that can scale from concept stage to being an engine for job creation within a brief period.

This report identifies key cluster problems and trends within each of the ARK clusters. These problems and trends were identified using both primary and secondary data. The primary data was derived from the results of a survey completed by over 25 leaders in the ARK clusters.

The secondary data was collected from over 50 recent articles and publications that addressed the ARK clusters specifically. In addition, three in-depth interviews with key cluster leadership from transportation / logistics and retail are included in summary form.

KEY CLUSTER PROBLEMS

1. RETAIL CLUSTER

a. Margin Improvement

- i. As retail & consumer products companies continue to navigate through the downturn, it has become critical to successfully manage margins. Margins are being squeezed from rising input costs (i.e., commodity and energy) and an inability to pass these costs along due to low inflation, consolidation in the industry which is driving greater operational efficiencies, and private-label competition displacing national branded products. In this environment, companies need to formulate and execute strategically aligned cost initiatives across the entire organization. The industry needs solutions to help manage costs through process improvement, inventory management, technology and outsourcing solutions.

b. Reporting, Risks, Compliance and Controls

- i. The recent wave of business scandals and its impact on corporate reputations has heightened public, press, and investor scrutiny on retail and consumer products companies in particular, and as a result, management and boards are increasingly compelled to ensure that risk is properly managed across the enterprise to protect corporate reputation, brand image, and shareholder value.

- ii. Adding to these challenges, S&P will now apply enterprise risk analysis before issuing corporate credit ratings. Thus, retail and consumer companies must establish strategic risk management policies and foster an effective risk-management culture.

c. Responsiveness to Trends/Opportunities

- i. Not every industry trend should be acted upon by every retailer. A solution that would help to interpret technology hype/trends from what is commercially viable to inform retailers when to make a move or understanding how the status of an emerging or mature market segment aligns with a retailer’s own state of maturity & future plans for a particular consumer product good.

d. Customer Insights

- i. All retailers want insight into shopper habits and behavior, but obtaining valuable customer insight is not an easy task. The industry needs to find a solution that can deliver meaningful insight at an affordable price.

e. Inventory Management

- i. Inaccurate inventory records cost retail companies, on average, 10% of profits each year. Knowing what to buy, when to buy it and when to mark down or clear underperforming products has always been a key part of remaining competitive in the retail industry. Poor financial performance is the result of carrying too much stock or too many slow-moving items. However, being too lean on inventory is also bad, as retailers lose around 3% of potential sales due to the desired products being out-of-stock.

f. Marketing/Promotional Effectiveness

- i. Marketing and promotional spend is one of the retail and consumer industry’s largest expenses. However, traditional methods and measures of advertising reach and sales uplift are not refined enough to satisfy the demand for managing such a large element of spend. Ineffective controls and lack of performance measurement can result in inefficiencies that reduce growth and profitability. Solutions that facilitate the improvement of internal controls, reporting, and measurement of a company’s promotional investment can help to gain awareness of the effectiveness of money spent on marketing and help drive better decision making.

- ii. Retailers need solutions to help them engage with shoppers on products and ideas that are relevant to them outside the store. The focus needs to be on building relationships, not just pushing products.

g. Customer Service and Online Reputation Risk

- i. It is becoming increasingly difficult for retailers to pay for appropriate staffing at the store level.

Any type of mobile application that makes the process easier for the customer to locate additional information would be very beneficial.

- ii. It is very difficult for retailers to keep up with bad online reviews. Any technology that could help to track online customer reviews would allow retailers to combat them and make in-store improvements.

h. Prolonged Customer Experience

- i. While technology is bringing radical changes to how people shop, the bricks-and-mortar store remains the core of retail. The physical store, however, is no longer the final shopping destination; increasingly, it is becoming a piece in a larger, more connected customer experience. This transition will require retailers to innovate and re-think their operating models.

TRANSPORTATION & LOGISTICS CLUSTER

i. Inefficient Asset Utilization

- i. Truck transportation constitutes approximately one-fourth of the US's trillion dollar logistics cost. So-called "empty miles" increase fuels costs dramatically. The industry needs affordable cloud-based applications that address vehicle utilization, vehicle downtime, route efficiency, pick-up delivery efficiency, and cross-dock efficiency.

j. Spot Quote Management

- i. There needs to be a unified platform for customers and carriers to efficiently manage the spot quote process. Too many rely on e-mail and phone to complete these transactions, which results in redundant work and inefficiency.

k. Compliance and Regulatory Issues

- i. The Compliance, Safety, and Accountability (CSA) initiative by the FMCSA will continue to make it more difficult to hire and retain qualified drivers. Carriers with marginal safety scores will also have a difficult time operating in this new regulatory environment. This area presents multiple opportunities for the application of information technology. For example, many drivers CSA scores are in the hands of the carriers for which they work. Poor maintenance and aging equipment can result in violations that negatively impact a driver's safety score. There needs to be a platform created that focuses exclusively on helping drivers proactively manage their CSA scores.
- ii. Ensuring the driver is alert, within expected operating parameters, with hours of service regulations in an affordable, automated way is also a key issue in the industry.

FOOD PROCESSING CLUSTER

l. Compliance and Regulatory Issues

- i. The Food Safety Modernization Act (signed into law in December 2010) was the biggest revision to the country's food safety rules since 1938. Many of the provisions of the Act have already been

implemented, with the remainder to go into effect by July 2012.

1. The FSMA gave the FDA for the first time the authority to recall foods.
2. Food manufacturing facilities are now required to develop and implement written sanitation standard operating procedures based upon science that evaluate hazards that could affect the safety of food; identify and implement preventive controls; monitor the performance of these controls; and maintain records of such monitoring.
3. Once a hazard is identified, the facility must apply preventive controls, including at critical control points, to minimize or prevent the hazard and to assure FDA that the food will not be adulterated or misbranded for failure to declare a major food allergen. Registered facilities must also periodically re-evaluate potential hazards, monitor the effectiveness of the preventative controls, establish corrective actions and verify the effectiveness of their activities.
4. Once the FDA establishes the preventive controls and other related rules, it will ensure a high level of compliance by increasing the frequency of inspections, with a focus on food safety risk. It is projected that the FDA will hire approximately 2,000 additional inspectors over the next 3-4 years, with its \$1.4 billion in new costs being picked up by the larger food industry.

m. Consumer Habits

Changes in consumer preferences are being driven by both the economy and more of a focus on health and wellness. Companies must try to figure out what changes they need to make and what R&D to spend in order keep up with, and hopefully get ahead of, these changes in consumer habits.

n. Cold Chain

Maintaining refrigeration unit temperature and real time monitoring and management is a significant food safety issue.

KEY CLUSTER TRENDS

1. RETAIL CLUSTER

a. Shift in Strategy from Cost Containment to Growth Acceleration

- i. Compared to the past few years, retailers are focusing more on growth, building on the efficiency gains made in the prior years. Retailers spent the year focused on generating top-line growth by expanding their product lines and footprint. Marketing and advertising spend rose in 2012 for the first time in a few years, with most retailers employing funds to increase awareness, improve the quality of customer outreach, and deepen their multichannel presence. Headcount also stabilized, even growing in some cases as back-office functions like IT added staff in an effort to keep pace with the increased demands placed upon it. Given there is a shift in strategy from containment to growth acceleration, there are immense opportunities for

retailers over the next two to three years to improve selling platforms, customer engagement, and business performance and processes.

b. Online and Mobile Shopping

- i.** In 2011, retailers continued to work hard to plan and integrate their web assets and offer a consistent look and feel across all sales channels. They also focused on the effective use of social networking sites, integrating their online presence with other channels, and creating a more interactive online offering. Mobile payment platforms for consumers to make purchases either in store or online will continue to gain momentum in 2012. Retailers need to actively enhance and evolve their methods for consumer interaction in an effort to near that “perfect” one-to-one experience. A large population of consumers has completely adopted the mobile shopping experience, and this trend will continue as demographics move younger. Retailers who develop the right strategies and approaches to this relatively new platform will be in much stronger position than those who don't.

c. Shrinking Average Store Footprints

- i.** The combination of changing consumer shopping behaviors and hard-to-pass-up real-estate opportunities has created an opportunity for many traditional stores. Over the past few years, some large retailers have decided to forgo the hundreds of thousands of square feet they are typically known for and instead opened smaller stores, and consumers are responding quite favorably.

2. TRANSPORTATION & LOGISTICS CLUSTER

d. Comprehensive Connectivity

- i.** The various forms of wireless connectivity – Bluetooth for personal area networking, 802.11 wireless local area networking, and cellular wide area wireless networks for voice and data communication – are being combined into single devices that provide multiple forms of wireless functionality, bringing convenience to both users and to IT staff responsible for managing mobile devices.

e. Voice and GPS Communication Integrated into Rugged Computers

- i.** Leading cellular carriers have certified rugged handheld computers for voice communication, enabling data collection, data communication and cell phone functionality to be converged into one device. Converging data and voice onto an integrated piece of equipment can cut the number of devices system administrators need to support in half, which provides sustainable operating cost savings. Connectivity convergence continues with the integration of GPS communication into mobile computers.

f. RFID Technology

- i.** Hundreds of companies around the world are implementing RFID-based shipping, receiving and inventory visibility applications. A sub-trend behind RFID adoption for inventory, warehouse and

distribution operations is the use of vehicle-mounted and other mobile RFID readers to enhance or replace stationary models. With a mobile infrastructure, companies don't need to purchase, install and maintain a separate RFID reader for each dock door. Forklift-mounted and handheld readers can cover multiple docks, and be used in warehouse aisles and elsewhere throughout the facility, further reducing the required RFID investment.

g. Speech Recognition

- i.** Speech recognition helps productivity by reducing the need for users to look at a computer display. Following the larger IT trends of open systems and interoperability, speech synthesis/recognition capability can now be easily embedded into numerous legacy software packages, including warehouse management, picking and putaway, inventory, inspection, quality control and other applications. This simplified integration has been made possible by the recent development of terminal emulation (TE)-based speech recognition technology, which eliminates the need for a separate speech server and a proprietary interface between the speech system and the application software.

- 1.** One analysis for a high-volume distribution center concluded bar code data entry was four percent more accurate than traditional speech (99 percent compared to 95 percent), but bar coding would require 26 more full-time equivalent (FTE) workers to handle the same transaction volume. When a hybrid system featuring TE-based speech recognition was analyzed, it was found to match bar code data entry accuracy while requiring 22 fewer FTEs, making it the overall most efficient method when the consequences of correcting picking errors were considered.

h. Digital Imaging

- ii.** Transportation and distribution companies are using digital cameras integrated into the mobile computers so their drivers can capture proof of delivery, store stamped invoices, and detail conditions that prevent delivery. Technicians use the technology for proof of service. Other applications include capturing shelf displays and monitoring trade promotion compliance, collecting competitive information, documentation by inspectors, collecting evidence for accident reports, and recording damage and usage conditions for warranty claims.

3. FOOD PROCESSING CLUSTER

i. Private Label/Store Branded Food & Beverage Products

- i.** Frugal spending habits consumers developed during the recession appear to be deeply ingrained, as shoppers continue to be careful with food spending. Private label penetration in the supermarket has grown from 15 percent before the recession to more than 20 percent of total sales in 2011. As the economy improves, private label sales are expected to remain strong, and branded consumer packaged goods may find it difficult to regain lost market share.

j. The Greening of Food

- i. Consumers are becoming more and more concerned with the impact of their food choices on the environment. The industry has responded with packaging reduction initiatives, more ethical sourcing policies and the reduction of food miles.

k. Solid Waste Reduction

- i. Companies will continue to look at ways to reduce solid waste generation, use less or reusable packaging, and use biodegradable packing products. Excessive packaging has been reduced and recyclable products such as aluminum, glass, and HDPE are expected to continue being used to a wider degree in packaging situations.

l. Mechanical Versus Chemical Processing

- i. Companies will show increased consideration for using mechanical methods for food processing (e.g., the fruit and vegetable sector). Mechanical processing can be used to perform many of the same functions as chemical processing. The costs and benefits of using mechanical versus chemical processing will be further quantified to aid in decision making.

m. Pretreatment Options, Water Conservation, and Wastewater Reduction

- i. Pretreatment opportunities and water conservation will continue to be principal targets for pollution prevention source reduction practices in the food-processing industry. Pretreatment options look to minimize the loss of raw materials to the food-processing waste streams. Water used in conveying materials, facility cleanup, or other non-ingredient uses will be reduced, which in turn will reduce the wastewater volume from food-processing facilities. Wastewater treatment will continue to be the pollution prevention treatment focus for food-processing companies. The industry will continue to implement advanced innovative techniques to lessen the environmental impact of food-processing discharge wastewaters.

n. Rising Food Prices

- i. Food prices will continue to rise, leading consumers to use printable grocery coupons, frequent shopper cards and shopping lists. In addition, there will be increased shopping at non-traditional food stores and trading down to less expensive options. Consumers will continue to look to shave costs by augmenting their recipes by decreasing the amount of the more expensive meats and seafood and adding more non-meat proteins that are filling and less expensive.

CLUSTER INTERVIEW SUMMARIES

1. Transportation & Logistics Interview Inputs (Senior Leader in Operations Systems from the #1 Less than Truckload carrier in the US): Interesting Ideas for Mobile Applications or IT Enterprise Solutions for the LTL sector are:

Mobile Applications

1. Dimensioning components/functionality on board Handheld Computer
2. Continue improvements on speech to text applications
3. Laser quality scanner in smart phone footprint
4. More stable operating environment (eliminate reboot of device during shift)
5. Improve battery technology to get multiple days from single charge

IT Enterprise Solutions

1. Improve developer efficiency – Develop enhanced AGILE type process for reduced development times and costs
2. Improve OCR technology to decipher inconsistent documents to pull Shipper – Consignee – Address – Zip – description – pcs – weight from documents or images of these documents.
3. Affordable RFID spectrum readers that can be fixed mounted on a freight dock.
4. Develop in cab black box business hubs that connect to engine JBus, GPS, have Bluetooth or alternative personal area network capabilities, and are integrated with standard in dash radio component that utilize speech to text and text to speech capabilities for hands free navigation, messaging.

2. Interview Inputs from the #1 Truckload Carrier (Senior IT and Operations Executives):

Mobile Application Interests

1. J-Bus 1939 Interfacing for data analytics, preventative/predictive maintenance, driver behavior/performance monitoring, and reduction in idle time.
2. Real-time alerting and advance notice of customer / dock arrival within a one-hour window to eliminate “wait anxiety.”
3. Big data analytics or rewards points/gamification aspect to reduce driver churn and to incent wellness, health, and safety.
4. Final mile solutions that will improve delivery efficiency and on-time delivery rates.
5. Mobile applications to support and upsell value-added installation and support services for customers beyond normal freight delivery.
6. High value load tracking at the item and pallet level.
7. Container & trailer tracking.
8. Cold chain monitoring and management.
9. Loaded / unloaded real-time status and management.
10. Turn-by-turn directions in an unobtrusive, safe, truck-route-friendly manner.

Enterprise Application Interests

1. Social media sentiment tracking related to customers, competitors, and drivers.
2. Middleware / HTML5 migration and integration solutions.
3. Commerce documentation and improved freight bill scanning, management, and processes to improve cash flow cycle (has a mobile component as well).
4. Innovation tournament and positive reinforcement of company culture gamification and value points solutions (has a mobile component as well).
5. Cube/weight loading optimization.
6. Flex truck capacity optimization through owner/operator

and streamlined marketplace interlining portals without a loss of service levels.

7. Visualization of decision making process and presentation of GIS information in a compelling, visual way such as infographics to show connections among a great number of drivers and loads.

3. Senior Innovation Executive at a Major Retailer:

Application Interests

1. Social/collaborative problem solving tools across global enterprise.
2. Crowdsourcing solutions both within and external to the organization to get the right minds from around the globe weighing in on common issues, such as a process technology solution (communities of smart people connecting to broader communities of smart people).
3. Mobile applications that would support the “store of the future,” which needs to be customer-focused, more efficient, and smart-phone enabled.
4. Solutions to optimize the supply chain into smaller footprint stores.
5. Big data analytics and social sentiment and transaction analysis in real time.
6. Benchmarking solutions for optimization of global best practices and a means of efficiently sharing those across the enterprise with appropriate localization.
7. Food safety mobile monitoring solutions to ensure product efficacy and to reduce recall and waste.
8. Applications that support the push for sustainable enterprises.
9. Networking of logisticians and capability modelers to frame up problems from country to country and show common threads among them.
10. Coaching, compliance and service level training for food processing and food safety globally.