Lean Manufacturing, S&OP, and GIS
Proper Tools For Global Management

Jeff Greer
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KVH Industries

**Company**
- Founded in 1978 by the Kits van Heyningen family
- Went public in 1996 and today is traded on NASDAQ – KVHI
- Strong entrepreneurial spirit with organic approach to business development
  - new products and markets
- Sales $100M+

**Products**
- Satellite communication products – for mobile applications
- Tactical navigation systems – fault tolerant GPS
- Fiber optic gyros – platform stabilization

**Core Competency**
- Guidance and stabilization

**Legacy markets**
- Leisure Marine
- Military
Historical Operations Focus

• **Lean manufacturing initiative**
  – One piece flow
  – Demand pull system
  – Visual factory

• **Supply chain restructuring**
  – To include lower cost foreign part content
  – Primary focus Mexico and Asia

• **S&OP**
  – Traditional approach
  – Ten product families
  – Demand & supply plans
  – Resolution process
  – Trend charts to identify forecast bias

• **Facilities development**
  – New engineering facility
  – New product testing facility
  – New manufacturing facility
• KVH was approached by Viasat to form a new business venture focused on service
• Delivering low cost mobile broadband services to ships at sea and the aeronautical industry
• Viasat contributed state of the art earth station and modem technology
• KVH contributed stabilized antenna technology and access to the maritime market
• Effort started to stand up a global satellite network which was completed in 2011
• New challenge for KVH was to broaden its maritime market sales channel to include both commercial ships and sovereign navies
New Operational Focus

- **Hardware delivery**
  - Established competency

- **Megabyte delivery**
  - Network operations

- **Professional service delivery**
  - Services to help customers readily adopt KVH’s communication solution
    - Terminal installation
    - Data usage management
    - Network integration

- **Post install global service**
  - Simple one call service
  - On board break / fix
  - Global sparing
  - Repair depots
All the major satellite operators were present
Each portraying their satellites and operating footprints
Using geographic information systems (GIS) and wall mounted video monitors
The information displayed helped a person understand what was otherwise invisible

I quickly mastered basic GIS skills and modeled out KVH’s broadband service venture
Focusing on network infrastructure, points of sale, and mobile customers
This led to the realization that GIS tools are really well suited for global supply chain mapping, visualization, and design
• Every professional has a tool to help with the creative aspect of their job
  – Lawyers          Word processing for contracts
  – Finance          Spreadsheets for business modeling
  – Marketing        Desktop publishing for brochures and advertisements
  – Engineering      CAD / FEA/ CAM for creating new products
  – Project Managers Gnat Charts for coordinating large scale activities

• But what about the supply chain professional?
  – Well developed tools exist for:
    • Supply chain planning and management          S&OP
    • Supply chain execution                       ERP and JIT pull systems
  – Underdeveloped tools exist for
    • Supply chain design                          Spreadsheets and network diagrams
  – My prediction - GIS tools will create new ways to visualize and structure supply chains
    • GIS tools offer a superior user interface
    • Data can be geocoded to give it a 3D positional presence on the earth
    • It is possible to visualize large scale, complex, global supply chains like never before
How Does This Relate To Today?

- Notion of specification driven supply chain design
- What a supply chain shall and will do in terms of performance
- Optimization challenge for the supply chain professional based on business need

- **Schedule:**
  - How dynamic is supply chain response time to demand changes?
  - The need for forecast accuracy decreases as lead times approach zero

- **Cost:**
  - Reported determinants of products cost:
    - Location 60% - Processes 30% - Management team effectiveness 10%
  - Dynamic response of long supply chains can be mitigated with modern logistics, but at a price

- **Inventory Investment**
  - To cover sudden demand changes or supplier performance issues becomes more critical as the cost of working capital rises

- **Quality**
  - Today it is assumed if a company is to be successful
How Can GIS Help?

• Supply chains are developed and managed by multi-functional teams of professionals
• They work in conference rooms far removed from suppliers and logistics providers
• It not uncommon to find each participant has imperfect knowledge of the entire supply chain
• A GIS supply chain model can help overcome an individual’s imperfect knowledge by improving their ability to see and interact with the supply chain on a holistic basis
• This can be useful during the S&OP resolution process
• It is also helpful for supply chain design or restructuring initiatives
• People tend to dismiss the facts until you make them visible
• Other thoughts? New ideas are welcome!
Demo
Simple GIS Model
Questions & Comments