

AEROSPACE EXPERIENCE CASE | Enhancing the New Product Introduction System (NPIS)



BETTER, FASTER, INTEGRATED





AEROSPACE EXPERIENCE CASE | Building Up Engineering and New Product Introduction System (NPIS)

On-Time Delivery Needed A Boost

A leading, innovative aviation designer and manufacturer had a resoundingly successful line of aircraft in their stable. Well-designed, stylish, safe, and affordable for the growing global private market. They had no shortage of public interest in their designs and orders flowing faster than they could keep up with in their current configuration. While the firm had ambitious near-term plans to extend their footprint with two new Florida locations, as well as build a massive, state-of-the-art Innovation Center by headquarters, they were looking for some support with shortening order-to-delivery times for their growing, very discerning customers. And, they needed it yesterday.

The firm needed to get back on schedule and meet committed program dates for their customers by the end of the year. With large, multi-year programs at stake, missing delivery dates was unacceptable for the customer, for the team's sterling brand reputation, and for their earnings growth. In order to meet program dates, the firm needed to increase Engineering productivity, shorten cycle times, and drive an aggressive but revenue-enhancing jump in delivery schedule adherence.

Our client already had some of the best Engineering resources in the world. However, they needed help extending their wealth of in-house expertise, and building up Engineering processes & management systems to be more productive and improve delivery schedule attainment.

A Deeper Understanding: Trapped Value Analysis (TVA)

Catalyft was selected for the initial 4-week analysis by the firm based on our extensive management expertise and prior demonstrated experience collaborating with Aerospace Engineering teams in particular. Several TVA activity highlights included:

- **Value Stream Mapping**—analysis of current product development processes, systems, metrics, and responsibilities, building up an initial redesigned model of future NPIS and supporting systems.
- **Current Program Initiatives Assessment**—deep review of three crucial current aircraft programs underway within the NPIS pipeline (at risk of late deliveries), analysis of supporting technical systems and training, and critique of the pilot program development process currently in use.



Aerospace

Case Synopsis

- Accelerating and strengthening in-house engineering capabilities within an aviation manufacturer to meet large, multi-year program delivery dates

Client Profile

- 40-year-old personal aviation designer and manufacturer focused on world-class safety, performance, and comfort
- U.S.-based with international Training Centers and Service Centers
- Private ownership

Financial Benefits

- **15 to 1** return on investment based on revenue gained from reduced time to market (well above our average ROI)
- Increased labor productivity for the Engineering team

Operational Benefits

- Streamlined, flexible product development process with reduced Engineering cycle times
- Improved delivery schedule adherence
- Robust metrics and dashboards supporting actions and decisions

Organizational Benefits

- Agile organizational design structure and clear roles & responsibilities assignments
- Enhanced schedule control application and continuous improvement impact
- Reduced Sales, Engineering, and Production frustration from misinformation, redundant work, and communication gaps
- New Engineering training program
- Upgraded project & knowledge management system, processes, and procedures



- **Data Analysis**—review of data hierarchy, quantification of NPIS cycle times, departmental coordination efforts, supply chain logistics, and in-house engineering capacities. Stage-gate metrics evaluation, efficiency studies surfacing information breaks, and time constraint paretos were deployed, too.
- **IT Systems Assessment**—deep dive into technology capabilities with regard to product development, digital workflow, Engineering communication channels (internal and intradepartmental), performance dashboards, and tech-supported training systems in existence.
- **Diagnostic Surveys**—focused primarily on employee-reported frustrations, potential solution suggestions, and an assessment of overarching organizational change readiness. A small sampling of supply partners' perception of the firm was also administered to round out the NPIS perspective.
- **Role & Responsibilities Charting**—a collaborative group exercise to understand the current roles in NPIS across Sales, Engineering, Procurement & Materials Management, and Production.
- **Project Management and Knowledge Management Systems Assessment**—qualitative scoring of the firm's information systems utilized to manage aircraft programs, as well as store and share technical, proprietary information (such as Engineering drawing trees, prototype templates, project artifacts, procedures, and training content).

Engineering Frustrations and Aircraft Completion Bottlenecks Jumping Out

As eluded to earlier, this designer and manufacturer was growing fast with unprecedented customer demand—far more than their infrastructure, management systems, and older processes could handle. Several of the more pernicious and costly constraints needing immediate attention included:

- **Lack of experienced resources** —Engineering teams in particular were stretched due to higher-than-expected employee churn, a department accepting only the best candidates, and a voracious demand for Engineering skills in the outside job market.
- **Unclear organizational design**—the firm was growing at such a rapid pace that their org charts were outdated and they did not have the time to step outside of the demanding day-to-day responsibilities to re-align organizational design with current needs.
- **Too many management meetings**—more than 20% of Engineering expertise and resources were tied up in meetings.



Catalyft Team's Collective Aerospace Engagements

25+
Aerospace Engagements

7 to 1
Average Aerospace Return on Investment

5
Average Workstreams Per Engagement

\$700 Million
Average Client Revenue Size

4
Average Worksites Per Engagement



- **Needed to enhance product margins while reducing development cycle times**—the team was immersed in the ongoing challenge to keep up with customer tastes while delivering on time. Next to safety concerns, the most feared, costly mistake is to disappoint a customer by not meeting agreed delivery expectations.
- **Under-developed Engineering coaching and skills training program**—the team needed more focus on delivery schedule adherence, rapid prototyping, quality enhancements, and personal productivity training. The firm was striving for a more fully-developed partnership approach between Functional Managers and New Product Engineers.
- **New Product Introduction System (NPIS) needed updates and enhancements**—NPIS needed to be re-engineered to handle higher volume demands, embedded with tighter cost controls, and infused with more precise aircraft delivery schedule adherence discipline. Upgrades involved processes, management systems, IT integrations, and organizational change management.
- **Better constraint visibility requested**—the team needed more usable management dashboards to focus on constraints impacting order-to-delivery schedule attainment in general and Engineering cycle times in particular. Current data flow and dashboards focused on metrics around budget and some loose scheduling parameters, but needed more visibility and precision regarding work-in-process, work packages, work order allocations, schedule adherence, resource constraints, and individual performance. The team needed the ability to raise a hand for help before time got away.

Engagement Development, Pilot Program Design, Implementation, and Training & Coaching

Based on TVA findings, a 24-week project roadmap was created—focused on reducing development cycle times by building up Engineering. Key elements implemented included:

New Product Introduction System (NPIS) enhancements

- Updated Engineering requirements
- Improved Statement of Work (SOW)
- Standardized project management planning and Engineering standard operating procedures (SOPs)
- Test and verification audit
- Failure mode and effects analysis
- Stagger gate reviews
- Gate review readiness checklist

Improved, streamlined NPIS processes

- Engineering workflow and assignments
- Program Management controls for three currently committed programs



CLIENT TESTIMONIAL

"The Catalyft team developed a well-thought-out plan backed by years of experience in process improvement. They performed an in-depth analysis to inform the implementation plan, and then provided experienced coaches with practical advice to front-line leaders to help execute the plan and hit the targeted benefits."

Senior Vice President,
Product Development
***** Aircraft



Organizational redesign with roles & responsibilities definition—getting Engineering teams partnering with Functional Management. Roles included:

- Platform Director
- Chief Engineer
- Program Manager
- Functional Manager
- Functional Directors

Capacity planning process and model with Engineering skills database integrated with IT—providing Engineering and the team at -large with a model to quantify the work capacity they have on-hand, near-term hiring needs, and schedule risks brought on by skills gaps. Several key elements to their capacity planning included:

- Customized capacity planning parameters & model
- Engineering skills database
- Roles & Responsibilities refresh
- Sales & Operations Planning (S&OP) integration

Project Engineer cadence expectations developed—including specific tasks such as:

- Reviewing system design with Functional Managers, (including costs)
- Creating and implementing a Design Compliance Check List (DCCL)
- Determining tasks and subtasks to deliver work packages
- Determining staff and skill level requirements
- Entering Engineering tasks and subtasks into JIRA

Structured Engineering training program—building up Engineering Management’s ability to develop and mentor Project Engineering Leads. Key training elements included:

- Management training—“How to support the team?”
- Knowledge sources for Engineering collaboration
- Value-added Engineering program
- Personal productivity best practices
- Latest product & quality specifications

Engineering Program Results

Through our collaboration, the Engineering Team now had the processes, systems, and procedures they needed to shorten new product cycle times and get aircraft to excited customers. Delivery schedule adherence increased dramatically after the program.

Valuing this collaboration based on revenue generated over baseline aircraft delivery rates, late delivery cost reductions, and increased Engineering productivity rates, the client generated a greater than 15 to 1 return on their investment in us. (Well above our historical 7 to 1 Aerospace average.) The firm is happily delivering more aircraft on time; so, we’re happy, too.



Our Way of Collaborating

Identify



2-4 meetings at no cost

- Discussion of issues
- Alignment around probable causes
- Framing of analysis scope

Qualify



3-6 weeks at cost

- Qualify opportunities with Trapped Value Analysis (TVA)
- Quantify anticipated results
- Initial engagement design
- Key meetings: Launch, Opportunity Review, Solution Review, and Final Framing of analysis scope

Modify



4-8 months

- Final engagement design
- Execution of engagement design
- Realization & measurement of results
- Ownership & sustainability

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