Partners in Productivity

Integration of Factory Analytics at Nolte Manufacturing Project

PROJECT CHARTER DOCUMENT

Submitted By:

Apurva Sharma
Project manager
Nolte Precise Manufacturing
Email: Apurva.sharma@noltexx.com
Ph.: 123-7Y7-564

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Project #	*Project Name*	*Date Submitted*
Project charter #32223	**Integration of Factory Analytics at Nolte Manufacturing Project**	02-18-2018

PROJECT BACKGROUND AND EXECUTIVE SUMMARY:

Nolte Precise Manufacturing, a precision machine and assembly components provider for over 100 years, values high quality and throughput in its production pipelines. With significant advances in IoT, AI and Information Systems it is now possible to monitor and improve the quality and performance of manufacturing lines, plants, and enterprises. Nolte wants to capitalize on the new technologies and keep itself in a leadership position in precision machined and assembled components field by becoming a "smart factory."

Sight Machine, an Ann Arbor-based analytics firm, has been identified as the vendor that will enable Nolte to leap by deploying its analytics platform that has been purpose-built for discrete and process manufacturing. This project referred to as 'Integration of Factory Analytics at Nolte Manufacturing Project' is focused on collaboration of Nolte with Sight Machine and deploy analytics platform at Nolte to improve visibility, quality, and throughput of Nolte's manufacturing processes

PROJECT BUSINESS CASE:

Throughout its history, Nolte has been on the leading edge of innovation, striving to incorporate the most efficient business practices and utilizing the newest technology and equipment's possible. Nolte wants to continue to be at that forefront, revolutionizing the services offered to customers. Therefore, at Nolte, we are committed to meeting our customers' changing and evolving needs. As our customers look for services beyond parts procurement, we want to excel at offering innovative supply chain solutions.
Integrating latest IoT technologies and analytics platform will benefit the organization in multiple ways:

- ***Better information capture and availability:*** By capturing and visualizing detailed, real-time information about the performance of its components, machines, lines, and unit, Nolte will be able to track each product's production lineage across machines. Observing and visualizing macro and micro trends of performance along critical metrics such as, like OEE, first-pass yield, and scrap rates will be made possible through this project's implementation.

- ***Improved quality and throughput of machines, lines, and units:*** Using advanced analytics will help to predict different component failures and hence will contribute towards foretelling machine downtime. Use of advanced analytics will also help to mine out machines, components, and parameters especially the ones which are result in below-par performance. Applying advanced analytics and software technologies will benefit Nolte to set up processes to identify, monitor and alert on occurrence of anomalous process parameters. Further it will improve performance on multiple metrics such as
    - Failure rate
    - Scrap costs
    - Successful Production schedule execution
    - Labor costs

- Early failure detection and prevention
- Data correctness and collection

Hence, by integrating Sight Machine factory analytics with our existing framework, Nolte, will be able to fulfill the promise of being able to provide a total cost solution to our customer's parts needs and supply chain requirements.

PROJECT DELIVERABLES:

Product deliverables:

1. Live, fully functional and integrated Enterprise Manufacturing Analytics(EMA) product connected with Nolte's line of computer-based machining equipment consisting of 34 machines
   - 1.1 Components of EMA: Advanced Global Ops View, Productivity Application Suite, Quality Application Suite
   - 1.2 Cloud based backend database for EMA fully functional and transparent to Nolte

2. Integration of EMA with Nolte's existing Job Boss manufacturing control system to develop a financial analysis system having a custom-developed database. This generates following financial reports for VP of finance
   - 2.1 Product Cost Analysis
   - 2.2 Employee Efficiency Analysis
   - 2.3 Profit Analysis by Product

3. Measurable Increase in manufacturing performance costs which can be attributed to the project via improvement in one or more the following metrics: Failure rate, Scrap costs, Production schedule miss costs, labor costs, early failure detection and prevention

Process deliverables:

4. A report for Sight Machines confirming the goals and specific information that stakeholders – executives, operations managers, and QA professionals to develop the training plan for the Nolte's staff to operate the 34 machines and EMA product at various levels
5. WBS
6. Development of a new Work schedule for shift supervisors and CNC machine operators for Sight Machine training well in advance of the final implementation-progress reports
7. A project plan with approved estimates for the project
8. A project overview presentation for the executive group and the Board of Directors scheduled on May 11, 2018.
9. A cloud-based project plan documentation repository containing and storing all required documentation accessed at various levels in the project team
10. Develop a user training plan to help Sight Analytics gain an understanding of the data sources we'll be working with – including machines, databases, and systems
11. Develop a user training plan to help understand Sight Machine's end-to-end solution that runs off of Nolte's existing systems and software.

12. QA Test plan: The detailed test plan will document how the custom database site will be tested, who will do the testing, and how bugs will be reported and fixed. This will be designed keeping in any buffer for the fixes required by the software development team and for rework and retesting.
13. Final project end and closing reports development
14. Final project end presentation for the board of directors and executives

CONSTRAINTS:

Known Project Time Constraints: - NA-
Cost Constraints: -NA-

ASSUMPTIONS:

- Project activities if approved will begin with the first implementation step starting on June 1, 2018
- No target completion date has been dictated by President Doug Caster as of now, but if board approves the project on May 11th Meeting, the project will continue to completion
- This project proposal is an agreement where all the stakeholders should abide by the rules as decided in the meetings and everyone involved has agreed to this interaction
- The proposed implementations of Sight Machine Analytics must be a valuable asset for Nolte.
- Current consultants and clients must actively support the project, so that it must reduce internal operating costs and generating new business.
- The new system must run on existing hardware and software, and it should require minimal technical support.

Dependencies:

- Other organization involved: **Job Boss**. This project highly depends on the fact that EMA will be able to be integrated with the existing Job Boss manufacturing control system framework.
- This charter document depends on the assumption that the company will have the required budget by April 30th to carry out this project activities.
- This budget and project plan will have been approved by the Board of Directors and executive group in the May 11th Meeting
- Project success will depend on coordination of efforts between the project teams and individuals or groups mentioned in charter scope document from both Nolte Precise Manufacturing including Job Boss control system and Sight Machines Analytics.

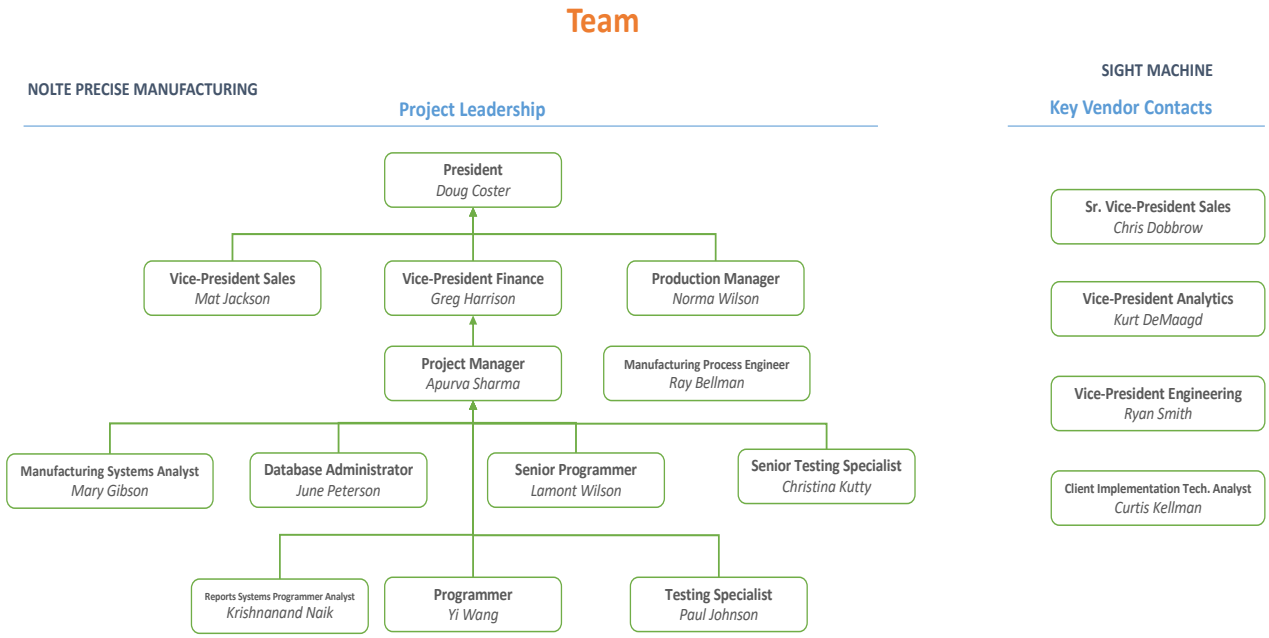
Out of scope:

Nolte will be using only computer-based machining equipment, including the CNC Milling, Swiss Machining and CNC Lathe Turning equipment to lay out the initial concept of a first-phase trial of smart-factory technology as these machines would be the best to convert to IoT technologies needed for the Sight Machine analytics software. There are 34 machines in this manufacturing line that will participate in this first roll-out. As of now, any work done apart from this first implementation on 34 machines of Nolte will be considered out of scope.

ROLES AND PROJECT STAKEHOLDERS:

#	Key Stakeholders	Name	Project Role
1	Final Approver & Sponsor	Doug Coster	President
2	Sponsor	Greg Harrison	VP, Finance
3	Sponsor	Norma Wilson	Production Manager
4	Sponsor	Mat Jackson	VP of Sales
5	Project Manager	Apurva Sharma	Project management
6	Manufacturing Point of Contact for Sight Machines (Nolte Manufacturing)	Ray Bellman	Manufacturing Process Engineer
7	Senior Point of Contact from Sight Machine for Nolte	Chris Dobbrow	SVP, Sales

PROJECT TEAM ORGANIZATION CHART:



PROJECT STEPS, FRAMEWORK, MANAGEMENT & INTEGRATION PLAN :

High Level Project Phase	Launch Sequence	Milestone	Milestone Details	Communication Management & Meetings
Project Conception, Initiation and Setup	1	Alignment on project goals, evaluation and steering controls	- Project goals, use-case with priority order, and work plan with timelines - Key performance metrics for performance evaluation - Key stakeholders with roles, points of contacts for business units	Project kick-off meeting with all stakeholders and Project plan documentation produced
Project Definition and Planning/ Scope Management	2	Scope and Budget development, Work Breakdown Schedule, Communication Chart	Human Resource Management, Risk Management and Stakeholder Management	- Project Plan Approval by 04-30-2018 - Board Meeting Presentation by 05-11-2018
Procurement Management, Project launch & Cost Management	3	Sight Analytics Survey detailing project Costs, Schedules with impact on different Nolte Business Units	Sight Analytics generates: - Procurement list with costs - Cost of change implementation, like machine downtime for upgrade - Nolte Time and resource commitment, like Nolte software personnel time requirements - Expected schedule and cost benefit	Daily meetings between Sight Analytics and Nolte IT and Manufacturing Teams and SMEs to align on - existing business process - business requirements, constraints - parameters of each processes that might have impact on production and hence key data points to capture
	4	Project Cost and Feasibility Analysis	Refine Cost and staff assignments	- Sight Machines presents the findings to Nolte business heads for alignment and approval on: upgrades, costs, schedules and resource downtimes - key data points to be captured
	5	Project go/no-go decision by Nolte	Live, fully functional and integrated Enterprise Manufacturing Analytics(EMA) product connected with Nolte's line of computer-based machining equipment consisting of 34 machines	Project documentation updated, and new ones added in cloud-based repository as suggested **First Implementation rolled out; Project Start Date: 06-01-2018**

System Implementation, Project Integration and Quality Management	6	Hardware and other resource procurement and Installation	- Nolte procures and installs hardware and other resources recommended by Nolte (including cloud subscriptions)	- Communication meetings between stakeholders for minor and major changes to procurement lists
		Setup and QA Testing Plans generated	QA Testing performed, and bugs are fixed	- Final testing and approval by Sight
		Kick-off training of Nolte professionals on the new platform	- Trainee list to be confirmed by Nolte - Training timeline to be confirmed by Nolte and Sight	- Meetings with Project Manager to finalize the trainee list and schedule
	7	Data collection and cleaning from IoT devices setup on the platform	- Setup data collection and processing for all 34 machines - Periodic testing and verification of data in collaboration with Nolte for identifying failures and issues early	- Regular meetings with manufacturing SMEs showcasing progress and user training docs prepared and trainings provided
	8	Required databases, with data model and data organization setup locally and/or in-cloud	- Setup the database that store all data collected and verify the data relationships captured with business SMEs	
	9	Software server of platform setup and software deployed	- Installation of the platform's software on procured servers locally and/or in-cloud - Includes installation of Global View Ops, Quality Application Suite and Productivity Application Suite	
	10	Digital twin model of manufacturing line in scope created	- This represents the manufacturing line in the software platform and has to confirm exactly with the actual manufacturing line implementation	- Regular meetings with Manufacturing teams to showcase the digital twin model and get approval from SMEs for correctness
	11	System integrated with Job Boss to exchange data for reporting and other purposes	- This will generate reports for VP of finances like: product cost analysis, Employee Efficiency Analysis and Profit Analysis by Product	- Interact regularly with Nolte IT teams to understand Job Boss API and integration interface

System Impact Measurement (Risk, Change, Mitigation report, Issue Management) & Project Closure	12	Performance of manufacturing line measured after predefined period of successful complete implementation-1	Final project closure and Project Success reports	- Performance Summary report discussion 1 - Other closing documentation and communication

POTENTIAL RISKS (Initial List)

- Risks involved during integration of the project with the existing system at Nolte
- Risk in terms of time required while designing and installation a prototype since it should satisfy the project requirements
- Risk of damaged procurements of items or faulty equipment's been delivered
- There may be some project adjustments once it is determined what the full cost of the project might be.
- Project end date, limit on number of staff that may be assigned to the project
- Although Sight Machine promises a target of typically 60 days for initial deployment to be up and running, the project complexity can vary, and hence access to Nolte's plant floor might get delayed, delaying the further steps of this project plan.

Issue Management

Issue descriptions, owners, resolution, and status will be maintained in an issues database from where the Issues will be addressed with the approval of Project Owner and communicated in the form of a project status report.

Change Management

A Change Control database will be established by the project manager to track all possible and already agreed changes. All Change Requests will be considered to determine possible alternatives and costs and will be reviewed and approved by the project owner. The effects of any approved changes will be reflected in the form of updates to the project plan

AUTHORIZATION & SIGN-OFF:

#	Name and Project Role of Approver	Role for Decision / Approval Points	Approval Signature	Date of Signature (MM/DD/YYYY)
1	Doug Coster, President	Final Approval & Sponsor		
2	Greg Harrison, VP, Finance	Primary Point of Contact at Nolte Precise Manufacturing & Sponsor		
3	Apurva Sharma, Project Manager	Project Schedule, Deliverables		
4	Norma Wilson, Production Manager	Sponsor, Procurement of computer-based machining equipment		
5	Mat Jackson, VP of Sales	Sponsor		
6	Ray Bellman, Manufacturing Process Engineer	Installation of Sight Machines analytics software data with chosen Nolte's equipment		
7	Chris Dobbrow, SVP, Sales	Final Decision Maker at Sight Machines		

COMMENTS

Note: Key stakeholders may use this section to provide important comments related to the project.

1) _____
2) _____
3) _____
4) _____
5) _____