etEngine-ERP Techno-Functional Information

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6. etEngine-ERP for APQP, PPAP, FMEA & Quality audit
7. etEngine-ERP management need & modules list
8. etEngine-ERP project implementation procedure
| Domain     | Foundry Domain specific solution  
|------------|--------------------------------------------------------------------------------|
|            | Decade of expertise in providing solutions to most of the verticals of foundry like auto component, steel, industrial, jobbing, investment & etc.  
|            | Provides the solution to core manufacturing problems  
|            | -Material Requirement Planning against metal grade, Scheduling, Subcontracting, foundry specific production work flow & etc.  
| Costing    | Estimation & Costing with product profitability analysis  
| Planning   | Material Planning & Schedule with customer delivery priority and complexity of Production  
| Design     | Design & Engineering change request of pattern, method card & history  
| Capacity   | Capacity analysis & fine tune the bottle neck of melting, molding & core making capacities  
| Energy     | Energy Utilization monitoring and variance analysis against each heat wise  
| Production | Work order wise production tracking with cost/time/quantity & performance analysis with work center wise production status  
| QA         | Control of Quality cost  
|            | -Rejection analysis with range of parameters-Heat, product, grade wise & etc  
|            | -Inward raw material & WIP material  
|            | -Quality plan, Non confirmation analysis with correctively action history  
| Automation | Automatic Integration with Spectro, electrical meters, UTI & quality tools  
| Tooling    | Tools life cycle management & history card  
| Maintenance| Complete solution for Maintenance to ensure optimum utilization of Plant  
| Control    | Solution to control cost  
|            | Manufacturing cost variance analysis –Online estimation & production cost  
|            | Drilldown costing variance analysis with breakup of Labor, machine & overhead cost analysis.  
|            | Raw material consumption control-with online issue against work order.  
|            | Planning for better utilization of capacity-machine, material & manpower  
|            | Better management of customer Order cycle time  
|            | Electricity consumption control  
|            | Quality cost reduction-inward & outward materials  
| Implementation Expertise | Successful implementation in 50+ companies all over India  
|            | Functional Engineers with 5 to 10 years of domain expertise  
|            | Flexible training option for top management to lower end labor team  
| MIS        | Shortest possible implementation cycle  
| BI         | MIS on Business plan & achievement  
| QMS        | One Point truth any time, any place, any where & any device  
|            | Solution of APQP,PPAP, document management & Audit management  

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etEngine-ERP Foundry specific work flow

Customer

Vendor

Sales & Service
(Sales Invoice
Domestic & Export)

Marketing
(Enquiry to
Order processing)

Estimation &
Costing
(Feasibility to
Product Costing)

Materials
(material request
to Purchase Order
processing)

Planning
(Raw material Plan
M/c scheduling)

Production
(Moulding
Melting
Pouring
FVI
QA)

Inventory
(material request
material issue)

Sub Contract
(Work Order
material issue
inward)

Excise, service
& VAT
(Inward
& Outward)

Finance & Control
(payables
Received
Cash & Bank)

Quality
(Inward material
WIP material
Outward material
Jobber Quality Check)

Plant maintenance
(Schedule Plan
Break Down record
Machine History)

Payroll
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etEngine-ERP foundry industry production specific solution

- Pattern Shop & tool management
- Melting-Cupola/Induction/Arc
- Core making
- Moulding
- Pouring
- Fettling
- Shot Blasting
- Heat treatment
- Packing
- Machine Shop
- Quality in each stages
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etEngine-ERP foundry industry specific solution

- Stores Department
- Melting Department
- Pouring Department
- Knock out and Quality
- Rough Casting Store
- Final Quality Stage
- Material Grade Specification Std.
- Chemical/Mechanical Quality
- De gating RR generation
- Core Box Tool Department
- Pattern Tool Department
- Match Plate Tool Department
- Moulding Department
- Core Department
- Fettling/short blasting Heat treatment
- Quality Each stage
## Pattern & methoding department

- Pattern life cycle management - Sample, production, repair & history
- Cavity wise production analysis: *Analysis of weight variance against each cavity*
- Performance analysis of each pattern: number impression produced & life of pattern.
- Methoding & gating system performance with revision history
- Cost of pattern development
- Dimensional variance

## Cupola

- Lining consumption cost analysis
- Bed coke consumption pattern
- Cost of liquid metal production
- Raw material consumption variance
- Supervisor performance against the LM target/good casting

## Induction furnace

- Lining cycle against the LM produced.
- Electricity cost against each heat production
- Cost of liquid metal production
- Raw material consumption variance
- Supervisor performance for the total LM production from
- Additives consumption pattern

## Core department

- Core rejection analysis in supervise and shift wise
- Core production planned and actual
- Cost of production shift wise / day wise
- Rejection analysis defect wise
- Supervisor performance analysis
- Item wise mould box production analysis
- Consumption variance with respect actual & norm.
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Moulding department

- Moulding Sand quality analysis
- Sand Mixer performance analysis: Muller wise
- Moulding machine idle time analysis reason wise
- Cost of production shift wise
- Supervisor performance analysis
- Item wise mould box production analysis hourly / shift wise / day wise
- Core rejection analysis in modeling department
- Planned and actual production analysis
- Filter and sleeve consumption pattern.
- Mould box rejection analysis defect wise

Pouring department

- Pouring performance analysis
- LM temperature analysis for boxes poured
- Supervisor performance analysis
- Item gap analysis b/w pouring and knockout to monitor the casting hardness
- Trace ability mould box hardness
- Planned and actual production analysis

Fettling department

- Fettling performance analysis, Labor target
- Labor billing monitoring
- Consumption monitoring for grinding wheels and welding rods
- Planned and actual production analysis
- Rework analysis, monitoring the casting rework.

Quality department

- Dimension check based upon the sample size / quality plan
- Test certificate preparation and tracking for casting
- Spectro data management with variance analysis with master data
- Composition planner with integration of spectro and melting reading
- Quality plan and variance analysis for incoming raw material
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etEngine-ERP for constrain based planning

- Sales Order
- Customer Delivery Schedule
- Production Plan Commitment
- Monthly Production Commitment
- Production Plan
- Core Plan
- Moulding Plan
- Liquid Metal Plan
- Fettling Plan

Foundry Capacity Variance

<table>
<thead>
<tr>
<th>Work Centers</th>
<th>Max Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core (Ton)</td>
<td></td>
</tr>
<tr>
<td>Moulding (Nos)</td>
<td></td>
</tr>
<tr>
<td>Melting (Tons)</td>
<td></td>
</tr>
<tr>
<td>Fettling (Tons)</td>
<td></td>
</tr>
<tr>
<td>Shot Blasting (Tons)</td>
<td></td>
</tr>
<tr>
<td>Heat Treatment (Tons)</td>
<td></td>
</tr>
</tbody>
</table>
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etEngine-ERP for lean manufacturing

etEngine-ERP & Lean Manufacturing

- Control Supply Chain
  - On-time Procurement Control & monitoring
    - On-time Dispatch against customer schedule & monitoring
      - On-time transport availability & info
  - Control Inventory
    - Material Planning Against Customer schedule
      - Production against Customer schedule
        - Inventory turn around cycle time & control
  - Control Cost of Production
    - Product Cost estimation tool
      - Activity based costing
        - Production Cost Variance & control
  - Control Wastages
    - Product Rejection Control & analysis
      - Power Consumption Variance & control
        - Raw material rejection Variance & control
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Foundry Automation with etEngine-ERP

Automation 1
Integration of live furnace consumption info with spectro heat analysis for better consumption control to avoid material losses by manual calculation

✓ etEngine-Composition planner automatically gets the raw material consumed in furnace heat and integrates with spectro of bath reading to get accurate input of high value material to furnace.

Automation 2
Automation of raw material consumption in each furnace with the ladle tapping information to calculate exact melting loss and better pouring information to increase material accountability

✓ etEngine-Melting log integrates with digital weighing system to get the exact charge of raw material and metal tapped to ladle with out any manual intervention for easy traceability between raw material consumed and metal poured.

Automation 3
Bar code to trace test bar & heats of the day

✓ etEngine-QC log integrates with bar code sticker will be attached with day wise heat info with each grade. Storage bag of test bars will be attached with bar code for easy & faster traceability of test bar when ever customer complaint

Automation 4
Automated estimation tool for accurate and faster product cost estimation for faster quotation generation

✓ etEngine-Estimation tool, gets accurate cost with live transaction data
  o Metal cost with accurate grade chemistry with raw material chemistry
  o Moulding cost with accurate box size with sand density
  o Electricity cost for melting and other overheads
  o Live financial general ledger tagging
  o Variance of cost with % of rejection
### etEngine-ERP with workflow integration & automation for system driven process

<table>
<thead>
<tr>
<th>Module</th>
<th>Integrated workflow</th>
<th>Alerts &amp; drive</th>
<th>Customer benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>Enquiry to Delivery schedule</td>
<td>Pending quotation alert, Pending Order alert, Pending delivery alert, Pending authorization alerts</td>
<td>“Biggest Foundry in east India” has reduced quotation generation cycle with increased numbers in quotation generation. From earlier 10 quotation/day to 60 quotation per day</td>
</tr>
<tr>
<td>Estimation</td>
<td>Product feasibility to product cost estimation</td>
<td>Automation in cost calculation</td>
<td>Most of customer’s accuracy in production cost estimation has increased to 98% and quote generation is faster without any manual intervention.</td>
</tr>
<tr>
<td>Production Planning</td>
<td>Delivery schedule to production planning</td>
<td>Alert in deviation of plan Vs actual production, Alert in deviation of plan Vs dispatch</td>
<td>All our auto component casting suppliers are able to man-over the planning sheet with automation of forward planning and capacity matching (moulding/melting)</td>
</tr>
<tr>
<td>Foundry</td>
<td>Automated Data capture and online integration Planning</td>
<td>Alert on excess consumption, Alert on excess rejection, Alert on high-energy utilization, Alert on inventory accumulation beyond the standard norm, Alert on variance of planned Vs production, Rejection cost analysis</td>
<td>With proper root cause analysis, rejection is reduced to 0.5% with saving of Rs 25,00,000/- for companies doing 20Cr turnover.</td>
</tr>
<tr>
<td></td>
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<td>With power consumption analysis report, saving was Rs 5,00,000 cost for companies doing 20Cr turnover.</td>
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<td></td>
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<td>With proper inventory control, non-moving inventory was reduced to 20%, with lot of maintenance materials was involved.</td>
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<td></td>
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<td></td>
<td>Reduction of stage wise inventory blockage to 30%</td>
</tr>
<tr>
<td>Financial Accounts</td>
<td>Seamless integration of purchase/stores/sales with MIS</td>
<td>Alert on pending receivables, Alert on pending payables, Cost center expenditure monitoring, Quality cost analysis-vendor, Rejection &amp; sales return, Cash flow plan for payables, Inflation on raw material analysis, Alert for pending work-Filing of returns</td>
<td>Faster year end closing cycle has reduced 70% of repeated documentation and can save 50% finance personnel salary.</td>
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<td>Payment collection cycle time has reduced to 40%</td>
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<td>Undue expenditure is reduced by 60% Profitability has increased by 3%</td>
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</tbody>
</table>
etEngine-ERP is partnered with Omnex for quality solution to enable below solutions

- Standardizes your APQP processes and documentation in all of your plants to allow for consistency
- Connects the Design FMEA to the Process FMEA.
- Automated "three click" APQP document creation builds FMEAs and Control Plans in minutes, not hours.
- Engineering changes made to the specifications of a product family will automatically update the Process FMEAs, Control Plans, and Check Sheets of all of the parts that are within that product family.
- Builds PPAP templates for each customer to meet unique document requirements.
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**What Management Need?**

- Real time Payables / Receivable info
- Pending order beyond deliveries dates
- Sales team efficiency analysis
- Daily dispatch info - value and qty
- Monitoring of efficiency with planned V/s actual
- Quotation required to be process for pending enquiry
- Pending quotation required to be followed up for order
- Raw material availability
- Daily rejection variance
- Availability of labor with daily attendance sheet
- Daily breakdown and corrective action report
- System driven work flow & better controllability

**Modules:**

1. Marketing
2. Sales
3. Material Management
4. Inventory
5. Planning
6. Production
7. Quality [Optional]
8. Accounts
9. Central Excise
10. Sub-contracting
11. Admin & company policy
12. Estimation & Costing
13. Plant Maintenance
14. etEngine-BI platform [Optional]
## Project implementation plan & time schedule-template

<table>
<thead>
<tr>
<th>No</th>
<th>Task</th>
<th>From</th>
<th>To</th>
<th>Days</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>System requirement study Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.a</td>
<td>Project Initiation &amp; Kick off meeting</td>
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<td>Joint</td>
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<tr>
<td>1.b</td>
<td>Requirement Study &amp; Gap analysis</td>
<td></td>
<td></td>
<td>Joint</td>
<td></td>
</tr>
<tr>
<td>1.c</td>
<td>Report Formats Finalization</td>
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<td>Joint</td>
<td></td>
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<tr>
<td>2</td>
<td>Installation of etEngine</td>
<td></td>
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<tr>
<td>2.a</td>
<td>Database creation and configuration</td>
<td></td>
<td></td>
<td>SPS INTRAD</td>
<td></td>
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<tr>
<td>2.b</td>
<td>User creation and rights configuration</td>
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<td></td>
<td>SPS INTRAD</td>
<td></td>
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<tr>
<td>2.c</td>
<td>Installation in machines</td>
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<td>SPS INTRAD</td>
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<tr>
<td>3</td>
<td>Training of Masters</td>
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<tr>
<td>3.a</td>
<td>Masters training-Commercial record</td>
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<tr>
<td>3.b</td>
<td>Masters training-Technical record</td>
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<td>Joint</td>
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<tr>
<td>4</td>
<td>Data Entry</td>
<td></td>
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<td></td>
<td>Customer</td>
</tr>
<tr>
<td>5</td>
<td>DB Configuration / Customization*</td>
<td>At-actual – Parallel activity will be concluded after SRS sign off</td>
<td>At-actual</td>
<td>SPS INTRAD</td>
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<tr>
<td>6</td>
<td>Installation of customized module</td>
<td>As per development schedule</td>
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<td>SPS INTRAD</td>
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<tr>
<td>7</td>
<td>Department wise transactions &amp; reports training (common training for common modules)</td>
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<tr>
<td>7.a</td>
<td>Sales &amp; Marketing</td>
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<td>Joint</td>
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<tr>
<td>7.b</td>
<td>Purchase, Stores, excise &amp; accounts</td>
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<td>Joint</td>
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<tr>
<td>7.c</td>
<td>Production, Planning</td>
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<td>Joint</td>
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<tr>
<td>7.d</td>
<td>Subcontract</td>
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<td>7.e</td>
<td>Plant maintenance &amp; Payroll</td>
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<td>Joint</td>
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<tr>
<td>8</td>
<td>Dry/Trial Run</td>
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<td>Joint</td>
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<tr>
<td>9</td>
<td>Go Live</td>
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<td></td>
<td>Customer</td>
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