Enterprise Industrial IoT Projects – Golden Rules

Do's and Don'ts that every IoT project should be built on

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ESE

Engineering und Software-Entwicklung

Operational Divisions

▸ Rail Operations

▸ Automotive Production

▸ Manufacturing Industry

Range Of Services

▸ Software-Engineering

▸ Testing & Verification

▸ Assessment-Services

▸ Data Analytics

Hannover

Braunschweig

Berlin

Hildesheim

Frankfurt

Erlangen

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State of Enterprise Industrial IoT Projects

▸ ## 60%
- • Stalled in Proof of Concept Stage

▸ ## 33%
- • Completed but failed

▸ ## 64%
- • Useful Lesson Learned

▸ ## 73%
- • Utilize Project Data

Thinkstock

FINISH

STRATEGY

What's Killing IoT Initiatives?

Cisco survey shows that nearly two-thirds of IoT initiatives are stalling at the proof-of-concept stage and one-third of completed projects fail.
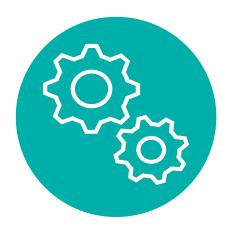
Courtney Bjorlin | Jun 06, 2017

→ www.ioti.com/strategy/what-s-killing-iot-initiatives

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Enterprise Industrial IoT Projects

Phases Of Concern

Proof of Concept

Asset Onboarding

Data Correlation

Analytics & Visualization

Archive & Maintenance

"Despite the challenges, many in our survey are optimistic for the future of IoT–

a trend that, for all its forward momentum, is still in its nascent stages of evolution,"

- Cisco, 2017

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Enterprise Industrial IoT Projects

Showcase of ESE reference project

Company

Production Site,

Metal Working Ind.

(250 employees)

stamping, machine by stock removal, rolling, welding, pressing, assembly

Machine Park

50 production Units

various Manufacturers

service age from recent to 20 years old

Splunk Use Case

Monitor machine fleet

capture and correlate Sensor Data

reduce distribution time

130.60.4 - - [07/Jan 18:10:57:153] "GET /category.screen?category_id=GIFTS&JSESSIONID=SD15L4FF10ADFF10 HTTP 1.1" 404 720 "http://buttercup-shopping.com/cart.do?action=view&itemId=EST-6&product_id=FI-SW-01" "Opera/9.01
128.241.220.82 - - [07/Jan 18:10:57:123] "GET /product.screen?product_id=EST-26&product_id=EST-26&product... "Mozilla/4.0
317 27.160.0.0 - .NET CLR 1.1.4322) "GET /product.screen?product_id=FL-DSH-01&JSESSIONID=SD5SL7FF6ADFF9 HTTP 1.1" 200 1318 "http://buttercup-shopping.com/cart.do?action=purchase&itemId=EST-26&product

Proof of Concept (PoC)

Getting Started

Scenario: Pick devices to be included

Natural First-Time Approach
- Pick a Machine that seems promising
- Link Raw Events to Indexer
- Create Barebones Dashboard
- Present Results to Customer

Issues to be expected
- Ignore production Machines you don't know
- Include only a fraction of available machine types
- Don't set a realistic goal to reach
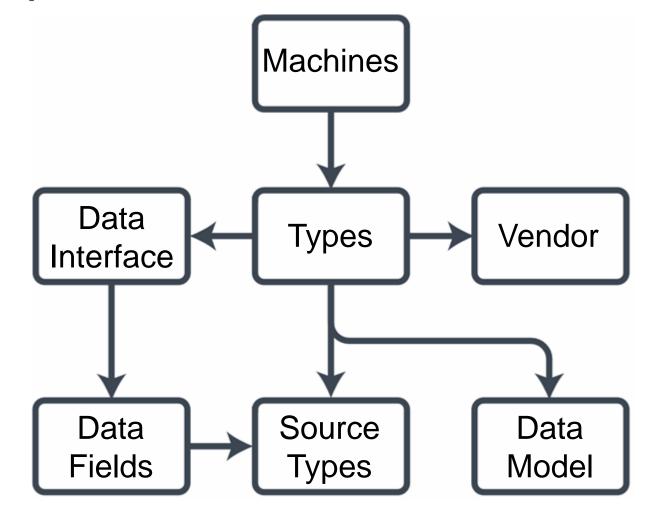- Assume high data quality for the sake of result

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IIoT Project – PoC Phase

Setting the PoC scope

Systematic Approach

- Analyze Machine Park
- Pick a set of representative Machines
- Link Raw Events to Indexer
- Implement Information Model
- Create Barebones Dashboard
- Present Results to Customer

Concept Map

IIoT Project – PoC Phase

▶ Do's

- Buy-In and Support from Management
- Focus First on the Business Outcome
- Follow multiple Approaches

▶ Don'ts

- Underestimate realistic Costs
- Stick to Failed Designs
- Re-Inventing the Wheel

Asset Onboarding

Initiate Data Transmission

Scenario: Building The Environment

Natural First-Time Approach
- Identify a management group
- Link Raw Events to Indexer
- Create corresponding SourceType
- Complete Group Onboarding

Issues to be expected
- Redesign of SourceTypes
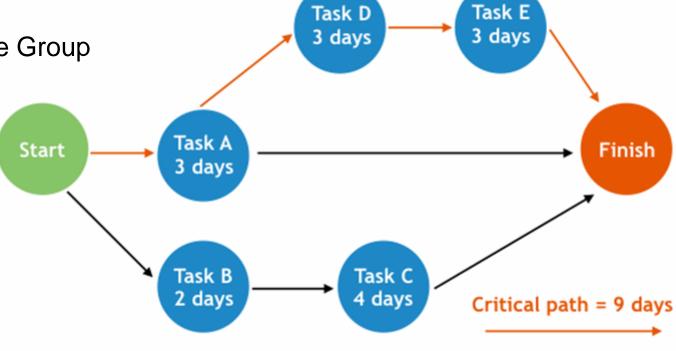- Unsafe Time-Schedule

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IIoT Project – Asset Onboarding

Setting Scalable Milestones

Systematic Approach

- Set individual Plan for each Machine Group
- Set Milestones for completetion

Critical Path

IIoT Project – Asset Onboarding

▸ Do's

- Clear Goals for Industrial IoT Data
- Systems Integration Plan
- Inpect Machine Fleet diversity

▸ Don'ts

- Ignore Challenges of Scale
- Underestimate Security Topics

Data Correlation

Manage Storage & Retrieval

Scenario: Building The Data Backend

Natural First-Time Approach
- SourceTypes are added at will
- Aliases / Calculations are duplicated

Issues to be expected
- Different Devices deliver different results in Analysis
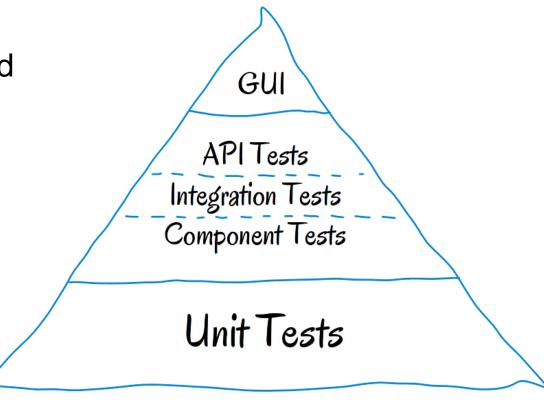- Production suffers from random Errors

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IIoT Project – Data Correlation

Storage & Retrieval

Scenario: Building Building The Data Backend

Systematic Approach

- Set Up Data Model(s)
- Point out fields, that are actually needed
  - Check for supply in SourceTypes
- Define general rules for Formatting
- Exchange Information with testing

Testing Framework

GUI

API Tests

Integration Tests

Component Tests

Unit Tests

130.60.4 - - [07/Jan 18:10:57:153] "GET /category.screen?category_id=GIFTS&JSESSIONID=SD15L4FF10ADFF10 HTTP 1.1" 404 720 "http://buttercup-shopping.com/cart.do?action=view&itemId=EST-6&product_id=FI-SW-01
128.241.220.82 - - [07/Jan 18:10:57:123] "GET /product.screen?product_id=SD5SL7FF6ADFF9 HTTP 1.1" 404 3322 "http://buttercup-shopping.com/cart.do?action=purchase&itemId=EST-26&GIFTS"
317 27.160.0.0 - [07/Jan 18:10:56:156] "GET /oldlink?item_id=EST-18&product_id=AV-CB-01&JSESSIONID=SD9SL4FF4ADFF7 HTTP 1.1" 200 2423 "http://buttercup-shopping
ows NT 5.1: SV1; .NET CLR 1.1.4322)" 468 125.17 14 100 "GET /category.screen?category_id=SURPRISE&JSESSIONID=SD5SL9FF1ADFF3 HTTP 1.1" 200 1318

IIoT Project – Data Correlation

▶ **Do's**

- Consider IIoT Platform applicability
- Edge versus Core Data Processing
- Bulid Information Model

▶ **Don'ts**

- Make Wrong Data Quality Assumptions
- Divide Backend and Frontend

Analytics & Visualization

create Insight & Business Value

Scenario: Building stable Reports

Natural First-Time Approach

- Every Team member develops his/her own
  - Dashboard
  - Knowledge Objects
- Every Customization Request is implemented
- Testing is done through presentation

Issues to be expected

- Product becomes hard to maintain
- Partial results get complex to correlate
- Production becomes less stable with progression
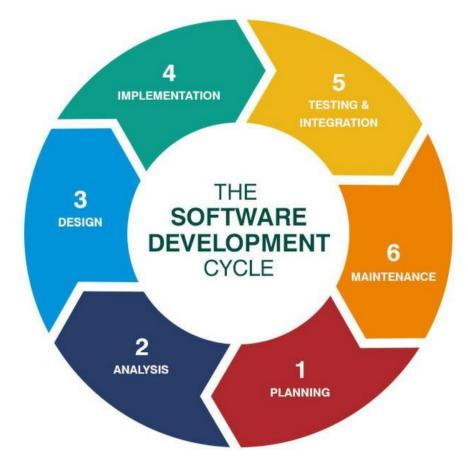- Development speed declines

IIoT Project - Analytics & Visualization

Insight & Business Value

Systematic Approach

- Set Up Development Progression Framework
  - Scrum
  - KanBan
- Implement Source Code Management
  - Git
  - SVN
- Distribute Virtual copies of Production Deployment
- Reference / Link Testing concept at every step

Agile Development Framework

THE SOFTWARE DEVELOPMENT CYCLE

4 IMPLEMENTATION
5 TESTING & INTEGRATION
3 DESIGN
6 MAINTENANCE
2 ANALYSIS
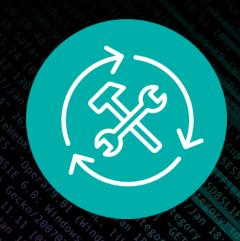1 PLANNING

IIoT Project - Analytics & Visualization

▸ Do's

- Stick to Standards
- Streamline Iteration Process
- IIoT vs. Traditional Software Development

▸ Don'ts

- AI & Machine Learning limitations
- Customize every Interface
- Miss on Perks already available in Splunk

Archive & Maintenance

Enforce Operations & Learnings

Scenario: Building Knowledge Base

Natural First-Time Approach
- Changes are done until last Minute
- One Deployment is considered „Final"
- Team is persuing new Projects

Issues to be expected
- Maintenance Developers will have Problems
- Productions is at risk

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IIoT Project – Archive & Maintenance

Enforce Operations & Learning

Systematic Approach

- Maintain Structure within Documentation
- Use standardised Archive Structure
- Reference / Utilize other Project Artifacts
  - Scrum Artifacts
  - KanBan Board
  - Project Plan
- Review Papers through 3rd Party Memebers

Archive / Colaboration Tooling

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IIoT Project – Archive & Maintenance

▸ ## Do's

- Distribute Knowledge evenly
- Implement Deployment Shedule
- Setup Retention Policy

▸ ## Don'ts

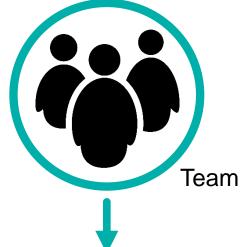- Lose experience when Development is done
- Lose touch to the Users

samuel-zeller@unsplash

Monitoring Your IIoT Project

Where are we now?!

Team

Progression Model

System Analysis

Tests

Documentation

Thank You

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