



Streamline your project engineering.

Reduce cost and risk with FLEX — Flexible, Lean Execution

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FLEX optimizes today's projects.

[Read what ARC says
about project execution](#)



The challenge

- 65% of projects above \$1 billion fail*
- Only 54% of projects get completed on time and on budget**
- 56% of failed projects don't meet their goals due to ineffective communication***

The obstacles

- Highly competitive market creates price pressures
- Traditional project milestones pose a cumulative risk
- Project margins are bid to be small to stay ahead of competitors
- Data matures late, impacting the project and profit

The solution

Schneider Electric™ FLEX (Flexible, Lean Execution) optimizes project delivery with methodologies backed by decades of experience.



* "Speed Kills," Klaver, Ali. 2012 Project Manager Magazine — <http://projectmanagemagazine.realviewdigital.com/?iid=57297&startpage=page0000019>

** John Fish, Rethink Everything Again!!! HBR 2013 — <http://www.houbrt.com/2005/documents/11-20-13-JohnFish.pdf>

*** Project Management Institute and The Boston Consulting Group, "Executive Sponsor Engagement," Pulse of the Profession, October 2014 — <http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/executive-sponsor-engagement.pdf>

FLEX closes the process design/automation gap.

Automation usually falls on the critical path to completion. Many projects suffer because process design and automation engineers can't share data early enough in the project timeline. FLEX methodology utilizes the process data as soon as it is available and matures, so you can build the automation system with fewer risks.

FLEX facilitates the completion of the automation system with:

- Universal I/O, cabinets, and virtualization
- Templates and rules based on prior experiences
- Specialized configuration and documentation software

The result

- 60 to 80% of the automation project configuration is produced automatically
- Hardware is shipped to the plant independently of software
- Risk and effort are reduced; projects are delivered on time — in some cases taking 30% to 45% of costs out of capital projects



FLEX streamlines project execution.

Integrated Control and Safety Systems are removed from the project critical path.

FLEX methodologies are based on cutting-edge technologies and decades of project execution expertise. The goal is to ensure schedules are met, minimize risk, and help cut capital costs for automation projects by as much as 45%.

Improve project quality

Employing better standards, years of expertise, critical rules, and best practices, FLEX delivers project excellence. Engineers gain more time to focus on complex logic and equipment integration, resulting in a positive impact on operation.

Reduce risk

Universal I/O provides more flexibility, rules validate processes in their earliest stages, and SPI integration returns data without manual errors. What's more, FLEX optimizes the project schedule because all components work together to reduce dependency on traditional project milestones.

FLEX drives efficiency.

Our methodology for successful implementation currently* consists of the following components:

Virtualized engineering

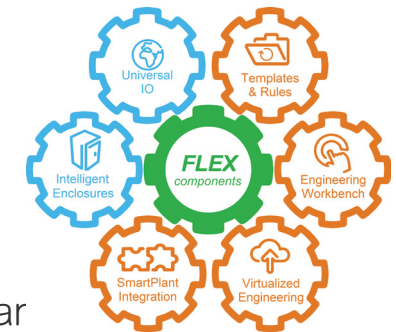
- Cloud-based, collaborative engineering for more proficient unit-based testing and reduced Factory Acceptance Test (FAT)

Engineering workbench

- Early data validation builds a more robust design
- Standard and simplified package interface solution
- Change requests dismissed when data is incomplete or incorrect
- Automatic data binding to support last-minute updates

Templates and rules

- Built-in safety and security rules (cannot be set aside for cost savings)
- Knowledge and best practices reuse



Universal I/O

- On-field ready, redundant software-configured I/O
- Automatic detection, configuration, and documentation of connected instrumentation

SmartPlant integration

- Auto-generate module control re-imports data automatically as it matures

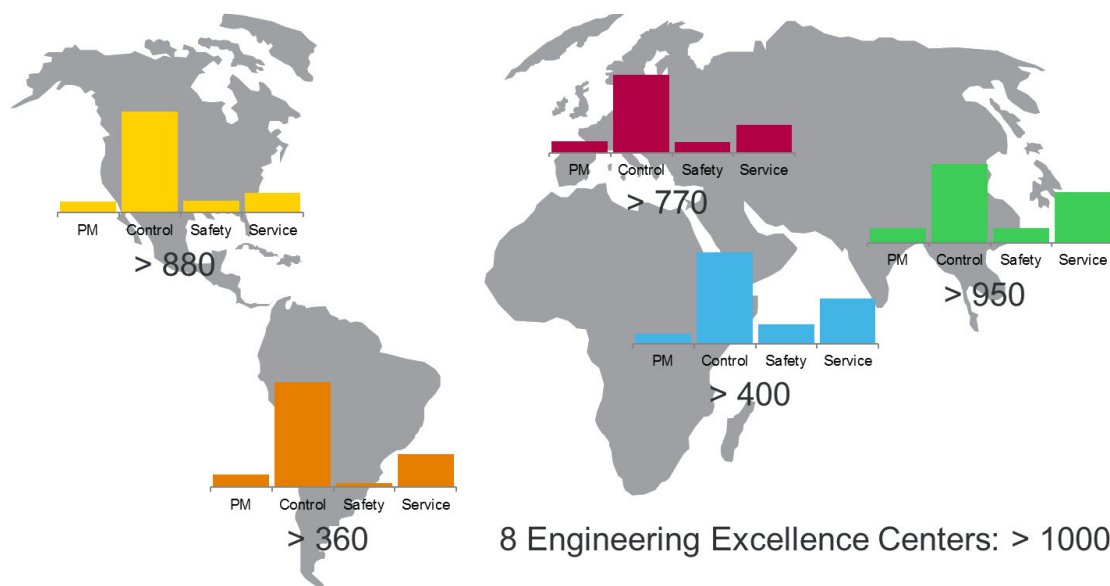
Intelligent enclosures

- Reduce customization and complexity
- Remove cross-wiring marshalling and associated rework as field design matures

*More components will be added to FLEX as the program evolves.

FLEX redefines the automation world.

Schneider Electric delivers a century of experience.



We have more than 4,200 engineers dedicated to providing service automation solutions. Their passion and expertise, combined with the FLEX approach and our latest technologies, reduce risk, decrease cost, and keep your project on schedule.

FLEX commands positive results.

“FLEX had a big positive impact on delivery times and quality of the final code, with the benefits of greatly reduced time to generate all tags required for the future projects.”

- Project Manager for the B2 and C2 refining project in New Zealand

“SPI Import generated approximately 6,000 loops without a single error.”

- Documentation Manager for the expansion of the world's largest greenfield refinery and petrochemical complex

“Engineering Workbench delivered what it promised. It allowed the client team to keep up with all changes, and there have been no delays due to the engineering process in the past year.”

- Project Manager for a refining project in North America

“We estimate about a 70% speed gain to generate the database.”

- Lead Engineer for a petrochemical project in Latin America



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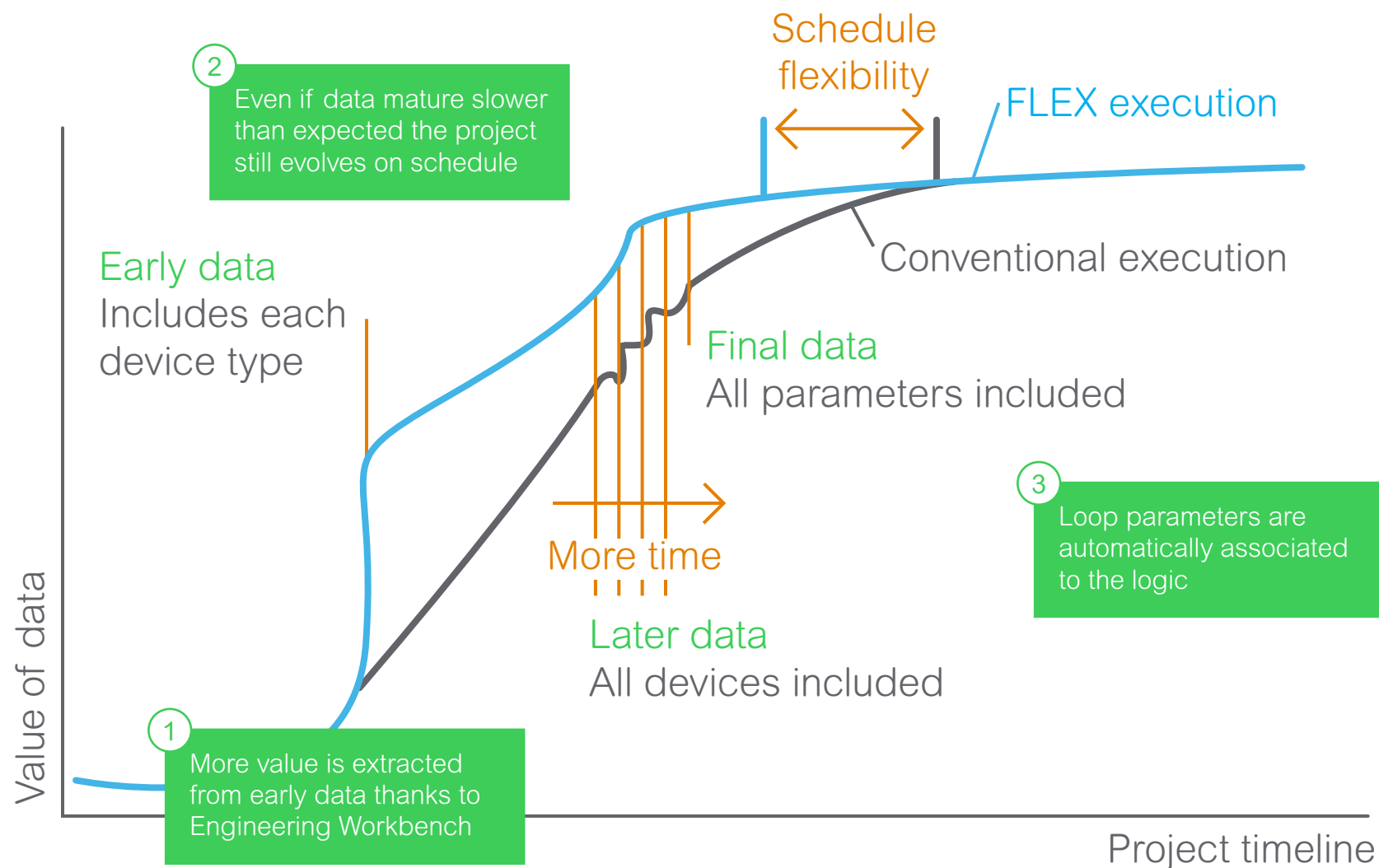


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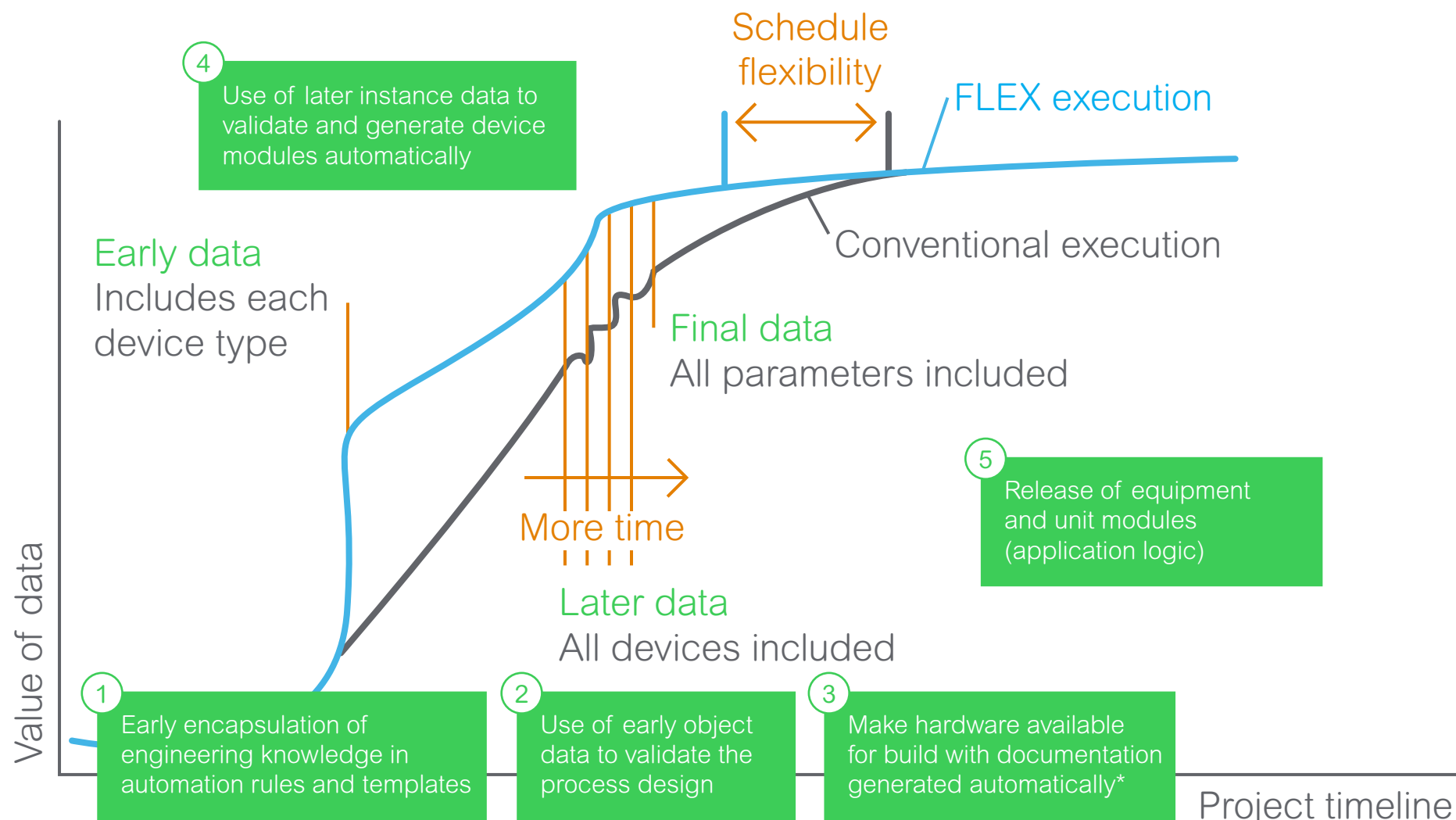
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FLEX value of data



FLEX value of data



* At early data stage if intelligent enclosures and UIO are adopted, otherwise at later data stage

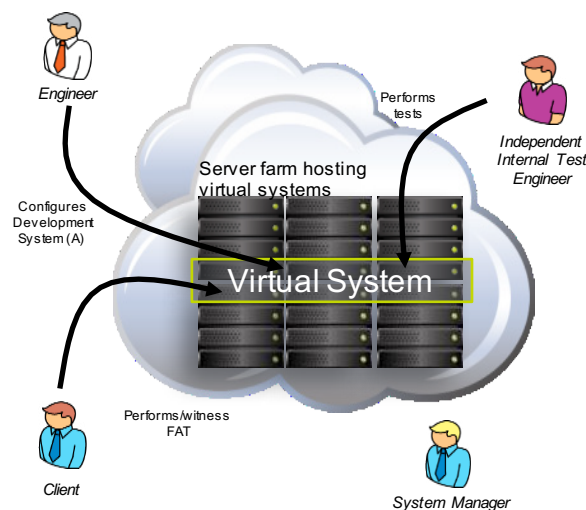
FLEX Virtualized Engineering Environment (SEVEE)

Advantages	Savings
Enables hardware to be shipped early and applications tested in a Virtual FAT	<p>\$82 million of projects are currently being executed on the SEVEE.</p> <p>\$32 million efficiency saving expected in 2016.</p>
Can utilize emulation and simulation to improve testing and therefore reduce risk. SEVEE allows offline service support to running systems.	7.5 on 44 weeks (17%) saved developing a CHP processing plant (approx. 4.000 I/O). Engineering team and client scattered between U.K., Spain, Israel, and Egypt.
	Global team working
Close link with the Operator Training Simulation team. More confidence on proper startup and operation.	<ul style="list-style-type: none"> Reduction in travel and accommodation (40 to 50%) Engineering Excellence Centers involved for testing Ability to test the system functionality from their own desk
	Just-in-time hardware build
Offers a seamless disaster recovery solution for critical projects.	<ul style="list-style-type: none"> Reduce time on the staging floor therefore reduce staging area required Reduced risk of delivered hardware obsolescence and failure

Features

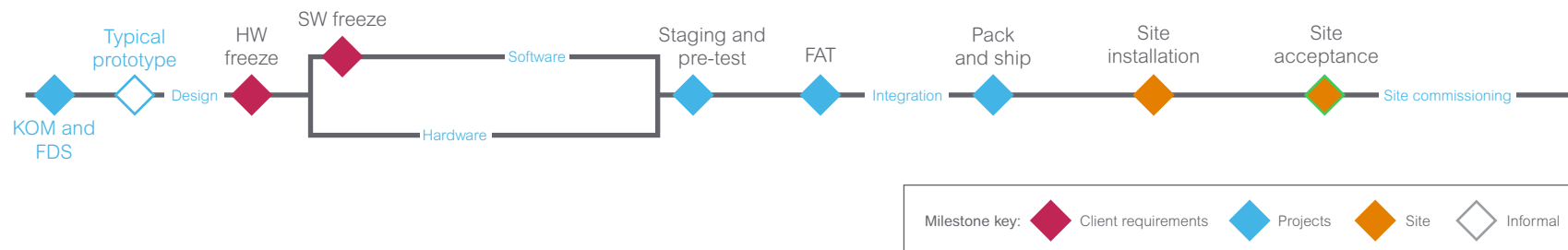
A Schneider Electric owned and supported virtual engineering environment that allows engineers to share, build, and test systems from any location.

- Acts as a repository for plant and facility drawings, layouts, equipment, and infrastructure information
- Remote access for clients and third-party vendors to collaborate in design and testing of an integrated system
- Installed capacity supports 200+ virtual machines

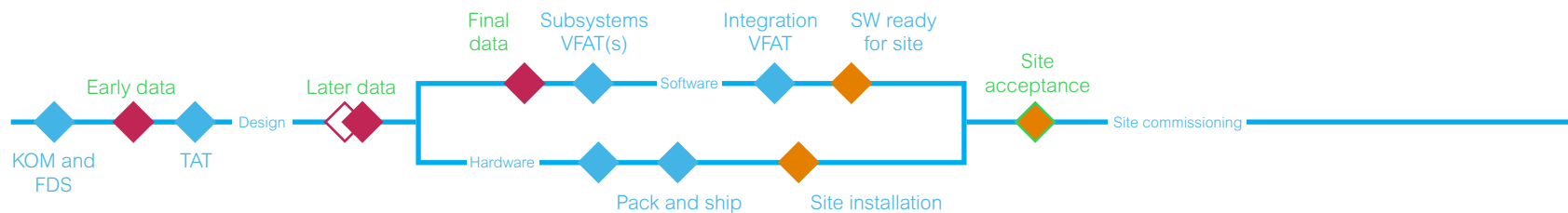


FLEX changes project's life cycle milestone

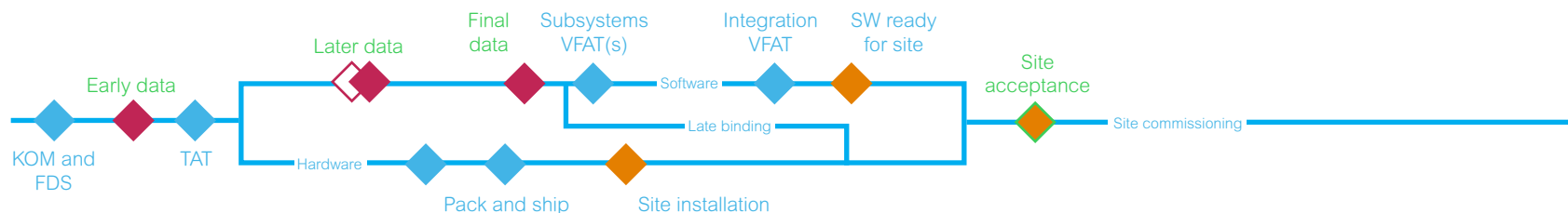
Conventional execution



FLEX execution Standard cabinets with VFAT

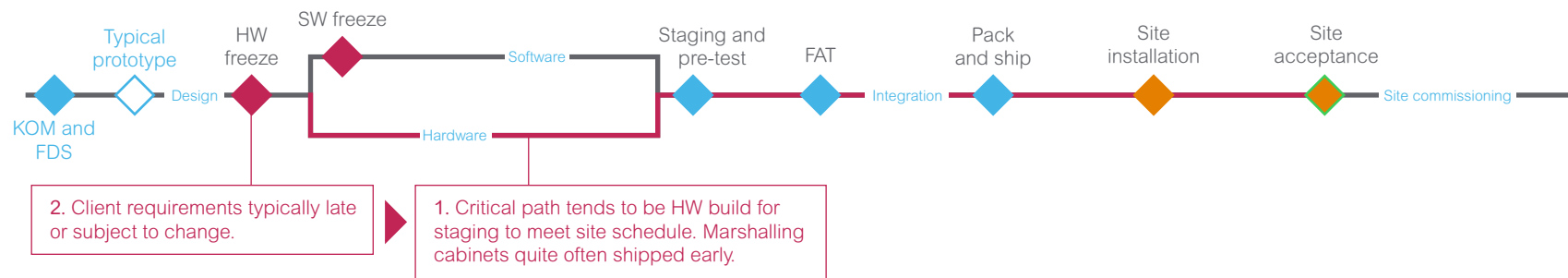


FLEX execution Intelligent enclosures/ UIO with VFAT

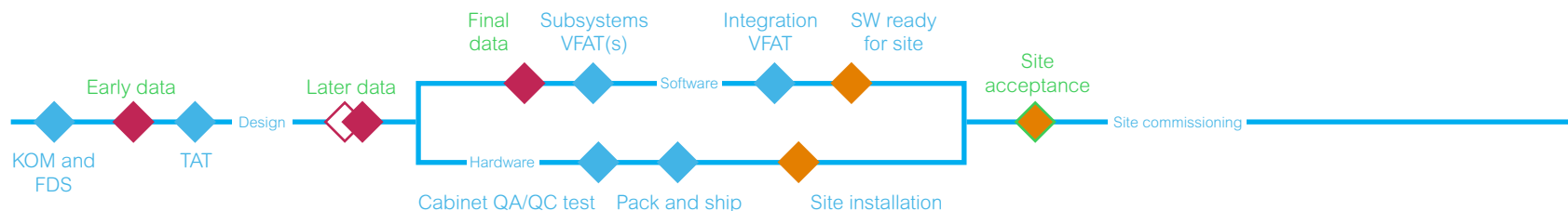


FLEX changes project's life cycle milestone — challenges

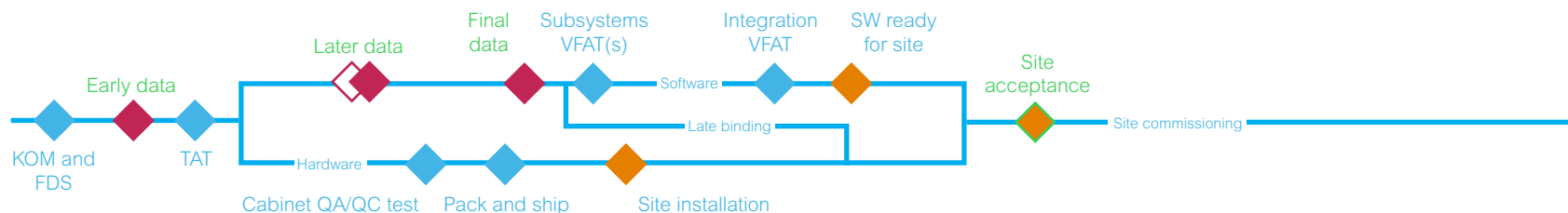
Conventional execution



FLEX execution Standard cabinets with VFAT

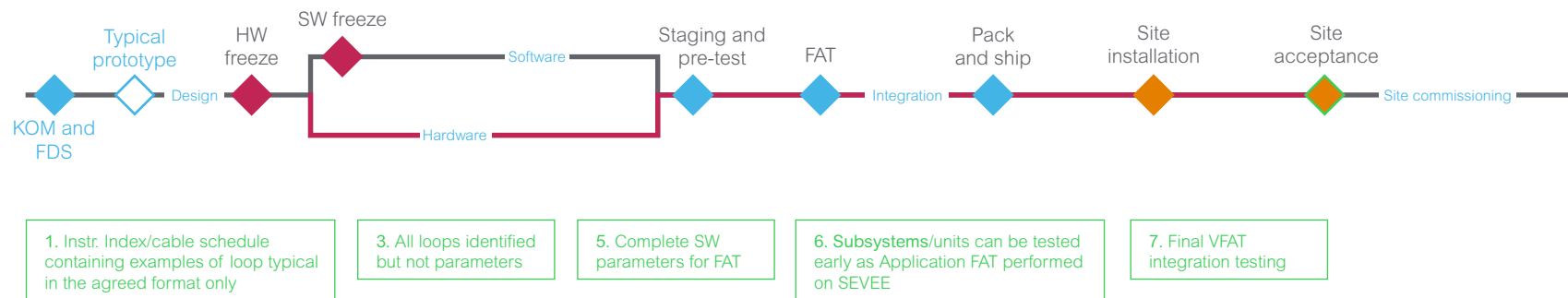


FLEX execution Intelligent enclosures/ UIO with VFAT

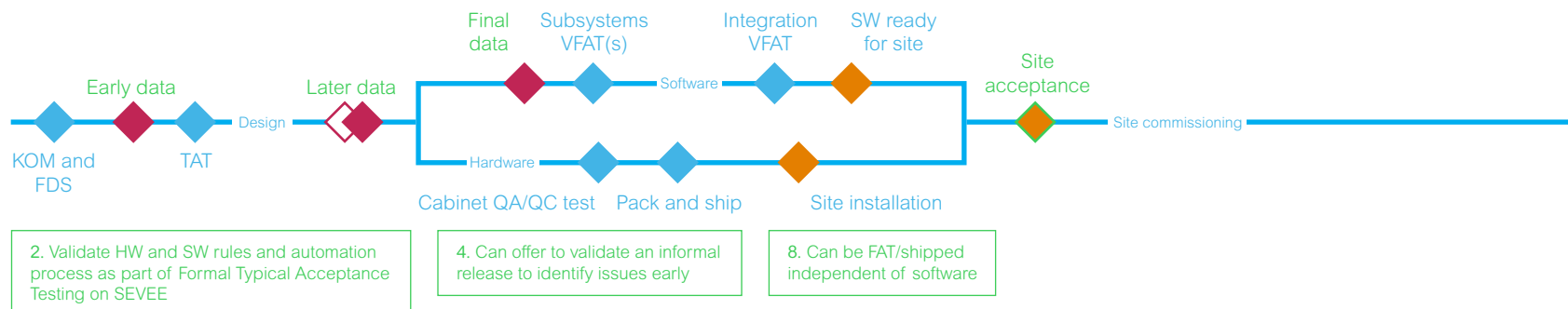


FLEX changes project's life cycle milestone — process

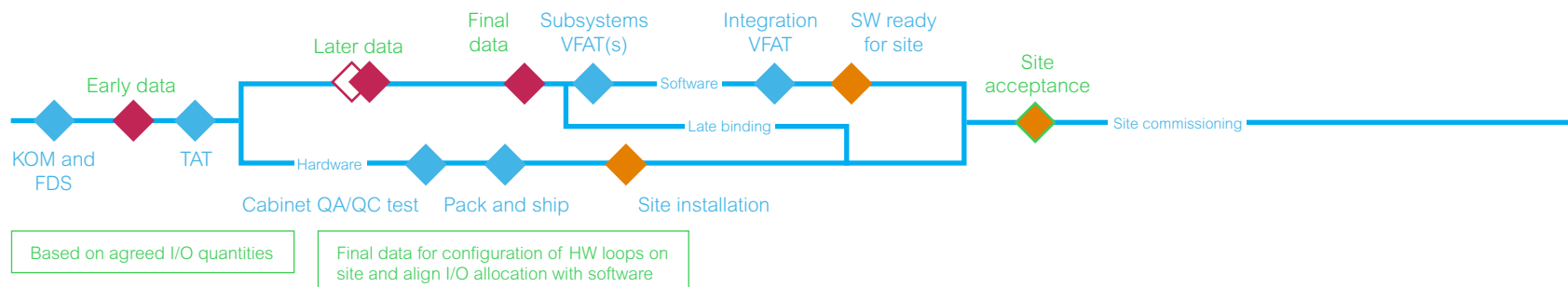
Conventional execution



FLEX execution Standard cabinets with VFAT



FLEX execution Intelligent enclosures/ UIO with VFAT

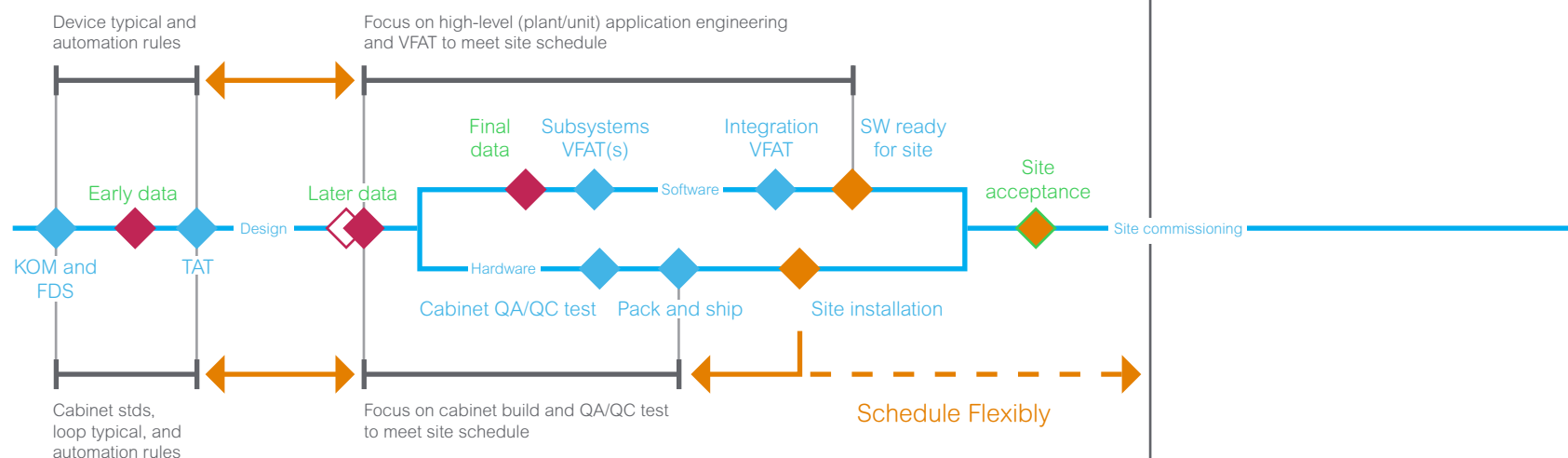


FLEX changes project's life cycle milestone — benefits

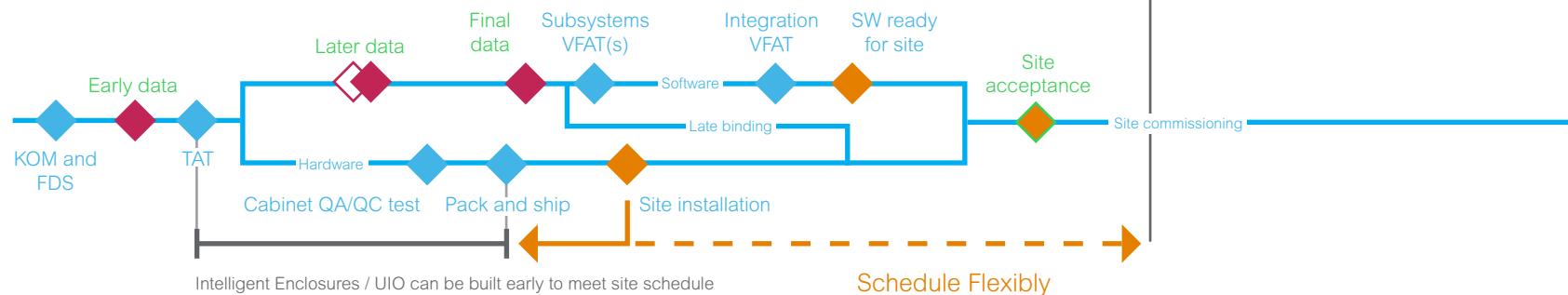
Conventional execution



FLEX execution Standard cabinets with VFAT



FLEX execution Intelligent enclosures/ UIO with VFAT

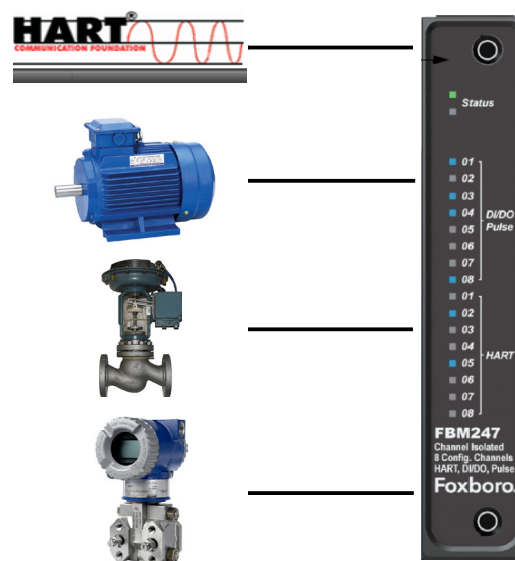


FLEX Universal I/O (FBM247)

Advantages	Savings for 10,000 I/Os
Plan I/O counts during the FEED stage and configure during installation	5 minutes of I/O 104 days
Facilitate late binding changes without lifting wires on the control side	5% of I/O changed, 4 hours each 250 days
Perform parametrization from remote locations as UIO FBM247 are software configurable	25% of I/O requires parameterization change once installed in RIB/LER, 10 minutes per I/O (if properly planned) 52 days
Suitable to replace remote field junction boxes even in harsh environments	60% reduction in terminations, cables pulled, cables run, drawings. \$250 per I/O \$1.5 million

Features

- 8 channel (16 future), per channel configurable
- Each channel analog (w/HART), pulse, digital
- Optional redundant
- Each channel isolated from all other channels and ground (600 VAC/1 min)
- Class G3 (Harsh) as per ISA S71.04
- UL/UL-C listed Class 1, Groups A – D; Division 2; T4
- DEMKO certified as Ex nA IIC T4 (Zone 2)
- Operation conditions: -20 to +70 °C (-4/158 °F)



Similar UIO for Triconex™ CX

Savings for 10,000 I/Os

Minimizes data entry requirements, thereby removing human errors

Backfills the project database using the as-built data available within the Engineering Workbench

Ensures data consistency and facilitates change tracking

Returns data to produce error-free ILD

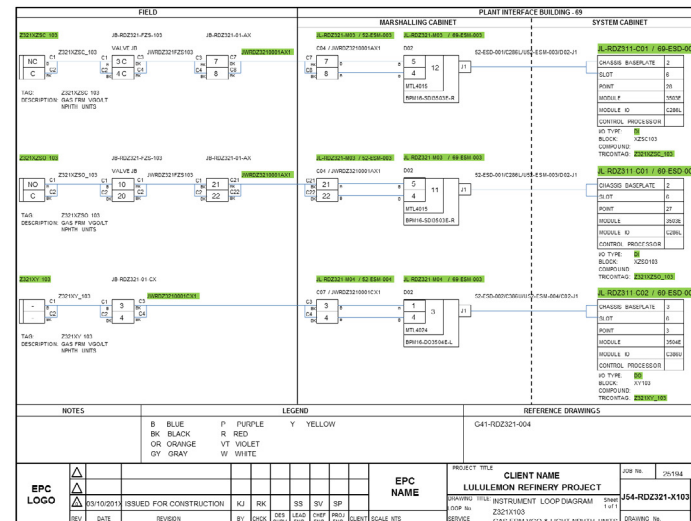
16 to 32%
time saving

40%
cost saving

Features

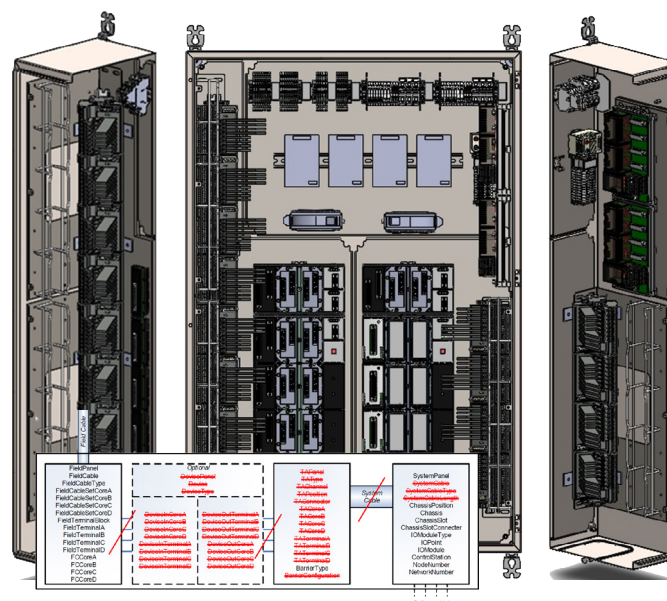
SPI Integration Component allows for consistent information transfer from SPI to Engineering Workbench and vice versa to generate error-free Instrument Loop Diagrams (ILD) and other reports.

- Exports SPI instrument and wiring index for use within Engineering Workbench
- Acts as a control and instrument design database
- Generates change management reports
- Returns as-built information in a digital format
- Validates system and wiring files to be backfilled to SPI database



Features

- Engineered standard cabinet for harsh enviro. (field junct. box replacement) – 800 W x 44 D x 1200 H mm
- Each channel analog (w/HART), pulse, digital
- Max 96 UIO channels – simplex/redundant mix
- No forced cooling/air conditioning
- AC or DC external power; redundant & daisy chain
- IP66 /NEMA 4X – modular construction
- UL/UL-C listed Class 1, Groups A – D; Division 2; T4
- Certified as Ex nA IIC T4 (Zone 2)
- Operation conditions: -20 to + 55 °C (-4/131 °F)



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