The Automation Bible: Your Essential Guide to Project Success

The complete, practical guide to delivering automation projects on time and on budget

---

Quick Start: Choose Your Approach

Large Projects (over £100K): Follow all sections below - plan for 6-8 weeks
Medium Projects (£25K-£100K): Focus on Planning and Definition - plan for 3-4 weeks
Small Projects (under £25K): Planning essentials only - plan for 1-2 weeks

---

PLANNING: Get Everyone Involved (Weeks 1-2)

Who needs to be consulted?

Always include if your project involves:

- Operator controls → Operations team from all shifts
- New equipment installation → Maintenance team
- Data collection or reports → Quality and Management
- Safety implications → Safety team
- Network connections → IT department
- Budget over £25K → Senior management

Key questions for each group

Operations Team:

- What information do you need during normal operation?
- What controls do you need for normal and emergency situations?
- Who should have access and at what level?
- What happens when the system fails - what's your backup?

Maintenance Team:

- What diagnostic information helps you troubleshoot quickly?
- How do you prefer to access equipment for maintenance?
- What spare parts do you typically stock?
- What documentation do you need for repairs?

www.sullsystems.co.uk
Registered in England No: 085211983

Quality and Management:

- What data must be recorded and for how long?
- What reports do you need and how often?
- How will you measure project success?
- What regulatory standards apply?

Safety Team:

- What safety functions are absolutely essential?
- What emergency procedures need integration?
- What training will be required?
- What happens if the automated system fails?

IT Department:

- What security and network requirements apply?
- How should data be backed up and recovered?
- Who will provide ongoing IT support?
- What cybersecurity policies must be followed?

Critical Decision: Control System Architecture

Choose basic relay control if:

- Simple on/off control only
- No data logging required
- No future expansion planned
- No operator interface needed

Choose PLC control if:

- Any data collection or storage needed
- Operator interface required
- Integration with other systems planned
- Future expansion likely

Important: When in doubt, choose PLC. It's much easier to start with capability you might need than to retrofit it later.

DEFINITION: Document Everything Clearly (Weeks 3-4)

Define what the system must do

Functional Requirements:

- What signals come into the system?
- What does the system control or operate?
- How should it behave in each situation?
- What information needs recording?
- What other systems must it connect to?

Performance Requirements:

- How fast must the system respond?
- How precise must measurements be?
- What's the maximum capacity or throughput?
- How much downtime is acceptable?

Define what is NOT included

Be explicit about exclusions:

- Modifications to existing electrical distribution
- Upgrades to existing field instruments
- Training beyond basic commissioning
- Integration with systems not specifically mentioned
- Future regulatory compliance changes
- Ongoing maintenance and support

Demand complete cost breakdown

Insist on itemised costs for:

- Hardware with specific part numbers
- Software licenses and ongoing subscriptions
- Engineering and programming hours
- Installation and commissioning time
- Travel expenses and accommodation
- Contingency allowance (typically 10-15%)

SELECTION: Choose Your Integration Partner

Evaluation checklist

- **Relevant experience:** Similar projects in your industry?
- **Local presence:** Available for ongoing support and maintenance?
- **References:** Can you speak to recent clients with similar projects?
- **Financial stability:** Will they be around for warranty support?
- **Technical capability:** Experience with your preferred technologies?
- **Project management:** Track record of on-time, on-budget delivery?

Essential contract protections

Must-have contract clauses:

- "No work outside defined scope without written change order"
- "All scope changes require client approval before implementation"
- "Change orders must include detailed cost and schedule impact"
- Clear payment schedule tied to specific project milestones
- Detailed warranty terms and coverage definition

EXECUTION: Maintain Control Throughout

Warning signs of scope creep

Watch for these indicators:

- Frequent "clarification" requests from the integrator
- Stakeholders asking "what if we also..." questions
- Comments like "I thought this was included"
- Integration proving more complex than originally anticipated
- New regulatory or safety requirements emerging during design

Simple progress tracking

Weekly progress checks:

- Are we meeting planned milestones?
- Any budget concerns or variances?
- Any new requests or technical issues?
- What decisions or approvals are needed this week?

Monthly stakeholder reviews:

- Budget actual vs. planned spending
- Schedule progress vs. planned milestones
- Summary of any approved scope changes
- Updated risk assessment and mitigation plans

Change control process

When changes are requested:

1. **Stop work** until the change is properly evaluated and approved
2. **Get written description** of exactly what's being requested
3. **Demand impact assessment** covering cost, schedule, and technical implications
4. **Consider alternatives** or trade-offs with existing scope
5. **Obtain written approval** from designated authority before proceeding
6. **Update all project documentation** to reflect approved changes

TESTING: Stick to the Original Plan

Factory acceptance testing discipline

- Test only what was specified in the original scope
- Document any deviations from the specification
- Resist the temptation to add "nice to have" features
- Keep a separate list of potential future improvements

Site acceptance testing

- Test with actual operators under real operating conditions
- Verify all system integrations work as specified
- Confirm all safety systems function correctly
- Document any site-specific adjustments required

Project handover

- Ensure complete documentation package is delivered
- Verify all specified training has been completed
- Confirm warranty terms and coverage are clearly defined
- Establish ongoing support and maintenance arrangements
- Create documented list of potential future enhancements

BEST PRACTICES

For project managers

- **Weekly reality check:** "Are we still building what we originally agreed?"
- **Change tracking:** Maintain log of all requests, including those rejected
- **Budget transparency:** Share financial status with stakeholders monthly
- **Stakeholder education:** Regularly remind team about change control procedures

For technical teams

- **Design freeze date:** Establish firm deadline for accepting design changes
- **Standard solutions:** Use proven designs rather than custom approaches where possible
- **Clear boundaries:** Define system interfaces and responsibilities explicitly
- **Review checkpoints:** Schedule formal technical reviews at key project milestones

For management

- **Approval authority:** Clearly define who can approve what level of changes
- **Contingency planning:** Maintain separate budget for genuine emergencies only
- **Priority decisions:** If changes are essential, determine what gets removed
- **Future planning:** Consider separate Phase 2 project for additional features

EMERGENCY CHANGES

When urgent changes are genuinely required:

1. **Document the urgency:** Why can't this wait until project completion?
2. **Explore alternatives:** Can this be addressed without changing current scope?
3. **Full impact assessment:** Complete analysis of cost, time, and technical implications
4. **Trade-off analysis:** What original scope items could be removed to compensate?
5. **Written approval:** Formal sign-off from designated budget authority
6. **Complete documentation:** Update all project documents, schedules, and budgets

---

SUCCESS INDICATORS

You know you're managing well when:

- No major surprises emerge in weekly status meetings
- All stakeholders clearly understand what they're getting
- Change requests are rare and thoroughly justified
- Budget variance stays within 5% of original estimate
- Schedule variance remains within 10% of original plan
- Everyone can clearly explain what the system will and won't do
- Future enhancement needs are documented for next budget cycle

---

THE GOLDEN RULES

1. **Invest time in upfront planning** - it's ten times cheaper than fixing problems later
2. **Include all affected stakeholders** - missing voices become expensive surprises
3. **Be explicit about what's excluded** - clearly state what you're not doing
4. **Choose system architecture for future needs** - retrofitting is always more expensive
5. **Control scope changes ruthlessly** - every change has cascading consequences
6. **Document everything thoroughly** - your future self will be grateful

---

Remember: The goal isn't to build the perfect system. It's to deliver exactly what was promised, when it was promised, for the price that was agreed. This guide provides the framework to make that happen consistently.

www.sullsystems.co.uk
Registered in England No: 085211983