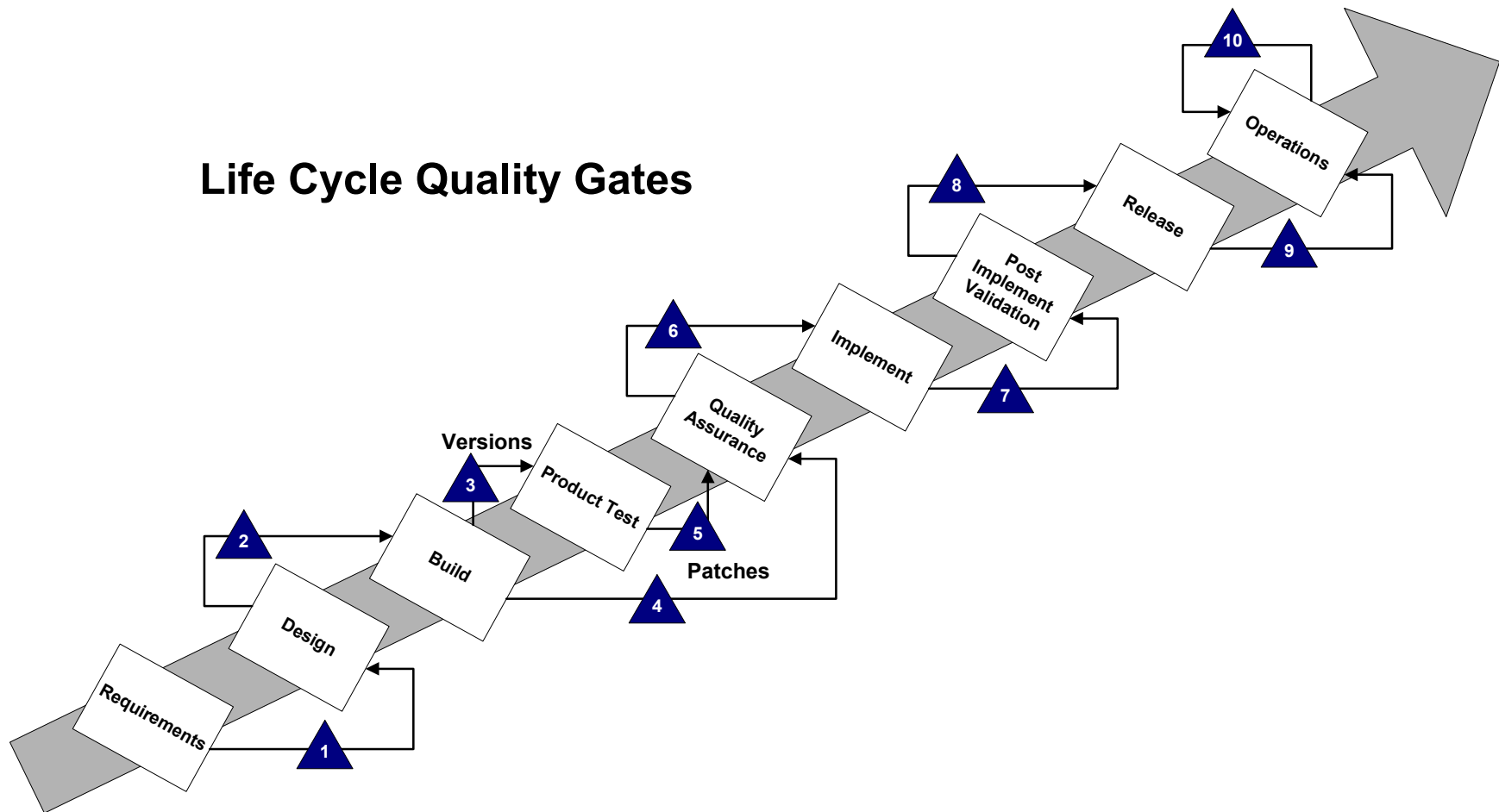


Life Cycle Quality Gates



Phase	Responsible	Deliverables	Quality Gate	SQA Metrics (Defects Injected In Phase)
Requirements	Sources: Executive Management Marketing Line of Business Managers Business Process Owners Business Systems Managers Product Managers Configuration Control Board	Requirements stated as: <ul style="list-style-type: none"> functions and featured needed based on business needs and/or objectives expressed as business rules service level objectives 	Quality Gate 1 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> "What" but not "How" or "How Much" unambiguous consistent (business rules do not conflict with one another) testable complete 	<ul style="list-style-type: none"> requirements churn defects (failure to satisfy quality gates)
Design	Analysts Standards SMEs Systems and software designers DBAs and data architects Infrastructure and network/telecom engineers Test engineers	Products and deliverables: <ul style="list-style-type: none"> scope and system boundaries definitions trade-off analysis functional requirements specifications systems/software requirements specifications technical specifications entity-relationship diagrams data flow diagrams database schemas security requirements interface specifications (internal & external) capacity and performance specifications systems architecture test plans Can also include: <ul style="list-style-type: none"> use cases state diagrams transition diagrams class and object definitions identification of objects 	Quality Gate 2 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> specifications traceable to requirements unambiguous testable complete 	<ul style="list-style-type: none"> design matches scope design rework (rejection by development) design clarification required by development defects (failure to satisfy quality gates)

Phase	Responsible	Deliverables	Quality Gate	SQA Metrics (Defects Injected In Phase)
Build	Developers Technical writers Configuration manager (software and document control)	<p>Products and deliverables:</p> <ul style="list-style-type: none"> code (source code, compiler object code and linked modules, executable code, objects and classes) DDL (data definition language) scripts database creation DML scripts (data manipulation language - queries, etc.); (SQL, SQL*Plus, PL/SQL, etc.) stored procedures, triggers and encoded business rules server-side scripts (csh, perl, cgi, etc.) data dictionary data documentation (keys, constraints, E-R diagrams, triggers and stored procedures) technical documentation operational documentation user documentation findings from peer, preliminary and critical design reviews of all documentation library control logs (manual or automated) build analysis release notes <p>Can also include:</p> <ul style="list-style-type: none"> object request broker configuration access control list development 	<p>Quality Gate 3 Conditions to be met/deliverable characteristics:</p> <ul style="list-style-type: none"> executable code passes unit and integration tests schema verification against database design documentation (includes validation of DDL scripts) data dictionary matches schema data dictionary, schema and data documentation validated against one another stored procedures and triggers return expected results DML and server-side scripts validated all documentation changes are traceable to source of/reason for change all documentation matches system as built source code changes (including code, DDL/DML and server-side scripts) can be traced to source of/reason for change code base is reconciled with library control logs a build analysis is provided with the product release notes are provided with the product 	<ul style="list-style-type: none"> # unit test failures # integration test failures # build discrepancies # instances of script rework # discrepancies found during schema verification # discrepancies found in documentation (traceability, # factual errors, # instances of missing information) Documentation follows FSS standards (yes/no) # source code reconciliation failures between code base and library control logs # errors in build analysis # errors in release notes (missing, incomplete or inaccurate information)

Phase	Responsible	Deliverables	Quality Gate	SQA Metrics (Defects Injected In Phase)
Product Test [also called IV&V or UAT/User Acceptance Test] (Versions)	Test engineers In some cases this function will be augmented by end-user SMEs from business process functional areas	Products and deliverables: <ul style="list-style-type: none"> test plans based on functional requirements specifications test cases aligned to functional requirements specifications written assessment of how well product meets functional requirements expressed as "observed results" vs. "expected results" 	Quality Gate 5 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> all items listed in the functional requirements specifications have been tested all results have been provided to developers/builders, business systems manager, applications support analysts, business process owners and any other stakeholders for go/no-go determination to promote product to QA 	<ul style="list-style-type: none"> # defects/discrepancies found in product test (escapes from build) source of defects/discrepancies found in product test
QA (Patches from Build or Versions from Product Test)	Test engineers	Products and deliverables: <ul style="list-style-type: none"> test plans based on technical, operational and user documentation and associated specifications (and functional specifications when testing products/patches that contain enhancements that have not been tested by Product Test) test cases aligned to technical, operational and user documentation and associated specifications (and functional specifications when testing products/patches that contain enhancements that have not been tested by Product Test) regression test plan and cases (usually a scripted suite of tests) tailored to build analysis and release notes written assessment of "observed results" vs. "expected results" 	Quality Gate 6 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> all test cases executed no observed severity 1 or severity 2 issues all results have been provided to developers/builders, business systems manager, applications support analysts, business process owners and any other stakeholders for go/no-go determination to promote product to QA 	<ul style="list-style-type: none"> # defects/discrepancies found during testing (escapes from build and/or product test) source of defects/discrepancies found in product test

Phase	Responsible	Deliverables	Quality Gate	SQA Metrics (Defects Injected In Phase)
ROLL-OUT Implement	Technical SMEs Project manager Business Systems Manager Applications Support Analysts Technical functional managers (DBAs, system administrators, network support, etc.)	Products and deliverables: <ul style="list-style-type: none"> change control documentation implementation plan roll-back plan escalation list implementation progress reports implementation QA plan signed-off implementation QA checkpoints Optional: process improvement recommendations	Quality Gate 7 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> build analysis, release notes, installation manual(s), media, equipment, etc. have been received and reviewed by the implementation manager all change control documentation is complete implementation is approved by business process owner, business systems manager and change control board all implementation QA checkpoints successfully completed implementation completed 	<ul style="list-style-type: none"> # implementation QA checkpoint failures requirement to roll-back (Yes/No) and root cause identification # discrepancies discovered in release notes, build analysis, installation manual(s) and/or defects in media or equipment during implementation time in minutes that maintenance window is exceeded
ROLL-OUT Post Implementation Validation (PIV)	Technical SMEs Applications Support Analysts End users	Products and deliverables: <ul style="list-style-type: none"> cycle 0 test plan 	Quality Gate 8 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> successful completion of all cycle 0 test plan criteria no severity 1 or severity 2 failures during PIV 	<ul style="list-style-type: none"> # cycle 0 test discrepancies # issues, by severity, opened during cycle 0 test period requirement to roll-back (Yes/No) and root cause identification
ROLL-OUT Release	Business process owner, Business Systems Manager and designated IT releasing authority	Products and deliverables: <ul style="list-style-type: none"> acceptance of system into production (business process owner and Business Systems Manager) authority to release to production (designated IT releasing authority) 	Quality Gate 9 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> all post implementation validation quality gates successfully met 	<ul style="list-style-type: none"> time in minutes that maintenance window is exceeded requirement to roll-back (Yes/No) and root cause identification

Phase	Responsible	Deliverables	Quality Gate	SQA Metrics (Defects Injected In Phase)
Operations	Technical SMEs Business process owner End users Business Systems Manager Applications Support Analysts Technical functional managers (DBAs, system administrators, network support, etc.)	Products and deliverables: <ul style="list-style-type: none"> • service level management • systems operation • new requirements identification • system improvement recommendations • system maintenance and operations (including back-up recovery, capacity/performance analysis and planning, etc.) 	Quality Gate 10 Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> • service level objectives are being met • required enhancements identified and analyzed/passed to requirements • maintenance windows not exceeded 	<ul style="list-style-type: none"> • service level attainment metrics • emergent requirements and requirements churn (evaluated vs. approved and approved vs. cancelled) • >20% delta between design capacity/performance predictions and observed capacity/performance characteristics • # information requests submitted because of inadequate or erroneous documentation, or discrepancies in build analysis or release notes
Production Issues	Help Desk Services Business Process Owner Business Systems Manager Applications Support Analysts Technical functional managers (DBAs, system administrators, network support, etc.) Development/Build (or ISV)	Products and deliverables: <ul style="list-style-type: none"> • identified discrepancies • discrepancies classified according to severity level • discrepancies prioritized • discrepancies not severity 1 or 2 scheduled for specific build or release • severity 1 or 2 discrepancies scheduled for patch 	Conditions to be met/deliverable characteristics: <ul style="list-style-type: none"> • validated to be discrepancy against functional requirements specifications and/or technical documentation • business process owner approves scheduled fix • testing for scheduled patches is coordinated with test team 	<ul style="list-style-type: none"> • defect removal efficiency (# defects discovered in testing/# defects that escaped into production) • where discrepancies were injected (phase) and how many per phase (defect density) • # false issues raised (system/application performing in accordance with functional requirements or technical specifications) • mean-time-to-failure (time to discover discrepancy) • mean-time-to-repair discrepancies •