MBASE/RUP Phase and Activity Distributions

Barry Boehm, A. Winsor Brown and Cyrus Fakharzadeh
COCOMO International Forum 14 – 10/27/99
### Milestones

1. **Inception Readiness Review (IRR)**
   - Candidate system objectives, scope, boundary
   - Key stakeholders identified
     - Committed to support Inception phase
   - Resources committed to achieve successful LCO package

2. **Life Cycle Objectives Review (LCO)**

3. **Life Cycle Architecture Review (LCA)**

4. **Initial Operational Capability (IOC)**

5. **Product Release Review (PRR)**

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### Milestones (cont.)

1. **Inception Readiness Review (IRR)**
2. **Life Cycle Objectives Review (LCO)**
   - Life Cycle Objectives (LCO) Package (see Table A.3)
     - Key elements of Operational Concept, Prototype, Requirements, Architecture, Life Cycle Plan, Feasibility Rationale
     - Feasibility assured for at least one architecture, using the criteria:
       - Acceptable business case
       - A system developed from the architecture would support the operational concept, be compatible with the prototype, satisfy the requirements, and be buildable within the budgets and schedules in the life cycle plan.
     - Feasibility validated by an Architecture Review Board (ARB)
       - ARB includes project-leader peers, architects, specialty experts, key stakeholders [Marenzano, 1995].
     - Key stakeholders concur on essentials, commit to support Elaboration phase
     - Resources committed to achieve successful LCA package

3. **Life Cycle Architecture Review (LCA)**
1. Inception Readiness Review (IRR)
2. Life Cycle Objectives Review (LCO)
3. Life Cycle Architecture Review (LCA)
   - Feasibility assured for selected architecture (see above)
   - Feasibility validated by ARB
   - Stakeholders concur on their success-critical items, commit to support Construction, Transition, and phases maintenance.
   - All major risks resolved or covered by risk management plan
4. Initial Operational Capability (IOC)
5. Product Release Review (PRR)
1. **Inception Readiness Review (IRR)**

2. **Life Cycle Objectives Review (LCO)**

3. **Life Cycle Architecture Review (LCA)**

4. **Initial Operational Capability (IOC)**

5. **Product Release Review (PRR)**
   - Assurance of successful cutover from previous system for key operational sites
   - Personnel fully qualified to operate and maintain new system
   - Stakeholder concurrence that the deployed system operates consistently with negotiated and evolving stakeholder agreements
   - Stakeholders confirm commitment to support Maintenance phase

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### Waterfall Phase Distribution Percentages

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A Management
AA Inception phase management
   AAA Business case development
   AAB Elaboration phase release specifications
   AAC Elaboration phase WBS baselining
   AAD Software development plan
   AAE Inception phase project control and status assessments
AB Elaboration phase management
   AEA Construction phase release specifications
   AEB Construction phase WBS baselining
   AEC Elaboration phase project control and status assessments
AC Construction phase management
   ACA Deployment phase planning
   ACD Deployment phase WBS baselining
   ACC Construction phase project control and status assessments
AD Transition phase management
   ADA Next generation planning
   ADB Transition phase project control and status assessments

B Environment; C Requirements; D Design; E Implementation; F Assessment; G Deployment
RUP Default Work Breakdown Structure (Royce, 1998) (Cont.)

B Environment
- BA Inception phase environment specification
- BB Elaboration phase environment baselining
  - BBA Development environment installation and administration
  - BBB Development environment integration and custom toolsmithing
  - BBC SCO database formulation
- BC Construction phase environment maintenance
  - BCA Development environment installation and administration
  - CBC SCO database maintenance
- BD Transition phase environment maintenance
  - BDA Development environment maintenance and administration
  - BDB SCO database maintenance
  - BDC Maintenance environment packaging and transition

C Requirements
- CA Inception phase requirements development
  - CAA Vision specification
  - CAB Use case modeling
- CB Elaboration phase requirements baselining
  - CBA Vision baselining
  - CBB Use case model baselining
- CC Construction phase requirements maintenance
- CD Transition phase requirements maintenance

D Design
- DA Inception phase architecture prototyping
  - DB Architecture design modeling
  - DBA Architecture design planning and conduct
  - DBC Software architecture description
- DC Construction phase design modeling
  - DCA Architecture design model maintenance
  - DCB Component design modeling
- DD Transition phase design maintenance

E Implementation
- EA Inception phase component prototyping
  - EB Elaboration phase component implementation
    - EBA Critical component coding demonstration integration
- EC Construction phase component implementation
  - ECA Initial release(s) component coding and stand-alone testing
  - ECB Alpha release component coding and stand-alone testing
  - ECC Beta release component coding and stand-alone testing
  - ECD Component maintenance
- ED Transition phase component maintenance
RUP Default Work Breakdown Structure (Royce, 1998) (Cont.)

F Assessment
FA Inception phase assessment planning
FB Elaboration phase assessment
   - FBA Test modeling
   - FBB Architecture test scenario implementation
   - FBC Demonstration assessment and release descriptions
FC Construction phase assessment
   - FCA Initial release assessment and release description
   - FCB Alpha release assessment and release description
   - FCC Beta release assessment and release description
FD Transition phase assessment
   - FDA product release assessment and release descriptions

G Deployment
GA Inception phase deployment planning
GB Elaboration phase deployment planning
GC Construction phase deployment
   - GCA User manual baselining
GD Transition phase deployment
   - GDA Product transition to user

Acronyms:
SCO - Software Change Order; WBS - Work Breakdown Structure

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A Management
B Environment and Configuration Management (CM)
  BA Inception phase environment/CM scoping and initialization
  BB Elaboration phase environment/CM
  BBA Development environment installation and administration
  BBB Elaboration phase CM
  BBC Development environment integration and custom toolsmithing
  BC Construction phase environment/CM evolution
  BCA Construction phase environment evolution
  BCB Construction phase CM
B Transition phase environment/CM evolution
  BDA Construction phase environment evolution
  BDB Transition phase CM
  BDC Maintenance phase environment packaging and transition

C Requirements
D Design
E Implementation
F Assessment
G Deployment

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COCOMO II MBASE/RUP Default Work Breakdown Structure (cont.)

E Implementation

F Assessment

FA Inception phase assessment
  FAA Initial assessment plan (LCO version; part of SDP)
  FAB Initial Feasibility Rationale Description (LCO version of FRD)
  FAC Inception phase element-level inspections and peer reviews
  FAD Business case analysis (part of FRD)

FB Elaboration phase assessment
  FBA Elaboration of assessment plan (LCO version; part of SDP)
  FBB Elaboration of feasibility rationale (LCO version of FRD)
  FBC Elaboration phase element-level inspections and peer reviews
  FBD Business case analysis update

FC Construction phase assessment
  FCA Detailed test plans and procedures
  FCB Evolution of feasibility rationale
  FCC Construction phase element-level inspections and peer reviews
  FCD Alpha release assessment
  FCE Beta release (IOC) assessment

FD Transition phase assessment

G Deployment

GA Inception phase deployment planning (LCO version; part of SDP)
GB Elaboration phase deployment planning (LCA version; part of SDP)
GC Construction phase deployment planning and preparation
  GCA Transition plan development
  GCB Evolution plan development
  GCC Transition preparation
  GD Transition phase deployment

Work Breakdown Structure Acronyms

ARB -- Architecture Review Board
CM -- Configuration Management
COTS -- Commercial-Off-The-Shelf
FRD -- Feasibility Rationale Description
IOC -- Initial Operational Capability milestone
LCA -- Life Cycle Architecture milestone
LCO -- Life Cycle Objectives milestone
LCP -- Life Cycle Plan
OCD -- Operational Concept Description
PR -- Product Release milestone
PRB -- Product Review Board
SSAD -- System and Software Architecture Description
SSRD -- System and Software Requirements Definition
### Development Activity Distribution

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S: 2 KSLOC  I: 8 KSLOC  M: 32 KSLOC  L: 128 KSLOC  VL: 512 KSLOC

### Maintenance Activity Distribution

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S: 2 KSLOC  I: 8 KSLOC  M: 32 KSLOC  L: 128 KSLOC  VL: 512 KSLOC

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