



DesignNews

Best Practices for Designing Real-Time Embedded Systems

DAY 1 : System Level Design Philosophy

Sponsored by



Webinar Logistics

- Turn on your system sound to hear the streaming presentation.
- If you have technical problems, click “Help” or submit a question asking for assistance.
- Participate in ‘Attendee Chat’ by maximizing the chat widget in your dock.

THE SPEAKER



Jacob Beningo

Visit 'Lecturer Profile'

Beningo Embedded Group - President

Focus: Embedded Software Consulting

An independent consultant who specializes in the design of real-time, microcontroller based embedded software.

He has published two books:

- [Reusable Firmware Development](#)
- [MicroPython Projects](#)

Writes a weekly blog for DesignNews.com focused on embedded system design techniques and challenges.

Visit www.beningo.com to learn more ...

Visit 'Lecturer Profile' in your console for more details.

Course Sessions

- **System Level Design Philosophy**
- Designing a Hardware-less System
- It's All About the Data
- Testing Your Way to Design Success
- The Best Practices Lightning Round

1

Why Best Practices?

Tips, Tricks and Best Practices, so what's the deal?

Why Best Practices?

Best Practices are procedures that have been shown by research and experience to produce optimal results and that establish or propose a standard for widespread adoption.

-- Merriam Webster Dictionary

Best Practices can cover:

- Architecture Design
- Artificial Intelligence
- Code Analysis
- Debugging
- Documentation
- GUI Design
- Language skills
- Processes and Standards
- Secure Processing
- SDLC Management
- Testing
- Tools

Why Best Practices?

Best Practice implementation requires discipline across three levels of a business for success.

Company

Management needs to buy-in to the benefits and agree to the value.

Team

Teams work together to adhere and reinforce.

Developer

Individual developers form the foundation.

Which level of discipline do you think is most important to maintain best practices?

- Developer Level
- Team Level
- Company Level
- All the above
- Other

2

System Level Design Philosophy

A design philosophy defines what to accomplish and which principles will be used to do so.

Challenges Facing Embedded Software Developers

Quality



- Buggy software
- Constant bug fixes
- Customer complaints

Development Costs



- Smaller budgets
- More features
- Increased complexity

Time to Market



- More debugging
- Missed deadlines
- Integration woes

Scalable Solutions



- Tightly coupled code
- Vendor dependency
- Inflexible architecture

System Level Design Philosophy

- Increase or maintain product quality
- Decrease or maintain product development costs
- Decrease or at least meet desired Time-to-Market goals
- Improve system application scalability

Design Philosophy Must Address, and De-Risk Challenges

System Level Design Philosophy

- Principle #1 – There is no hardware
- Principle #2 – Data dictates design
- Principle #3 – Testing is key
- Principle #4 – Continuous Integration / Continuous Deployment (CI/CD)

What is the greatest challenge you and / or your team is facing?

- Product Quality
- Development Costs
- Time-to-Market
- Scalable Solutions
- Other

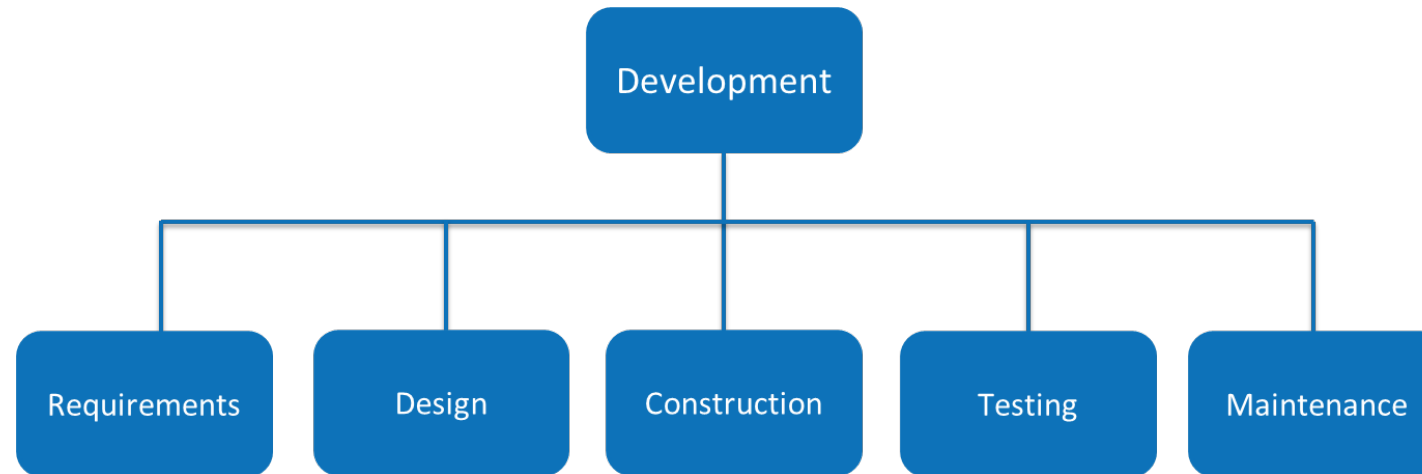
3

Best Practices for SDLC Management

The Software Development Life Cycle (SDLC) defines the processes, standards and best practices used to develop and maintain a software system.

Best Practices for SDLC

Each SDLC phase clearly defines the input and outputs for that phase.



Best Practice for SDLC

Metrics are the foundation developers use to quantify the effectiveness of their SDLC.

Example metrics include:

- Sprint burndown rate
- Function Cyclomatic Complexity
- Test coverage
- Defect removal efficiency
- Comment density
- Customer bug reports
- Meeting target deadlines

What metrics do you monitor? Are there any metrics that you should be monitoring but haven't gotten around to?

What metric do you think is the most important to monitor?

Sprint burndown rate

Function Cyclomatic Complexity

Test coverage

Meeting target deadlines

Thank you for attending

Please consider the resources below:

- www.beningo.com
 - Blog, White Papers, Courses
 - Embedded Bytes Newsletter
 - <http://bit.ly/1BAHYXm>



From www.beningo.com under

- Blog > CEC – Best Practices for Real-Time Embedded Systems



DesignNews

Thank You

Sponsored by

