



Industry Standard for Good Programming Practice: Benefits and Implementation

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GPP Board.

- Overview of GPP?
- GPP and project management
- Costs of not using GPP
- Implementing GPP
- Summary

What is GPP?

- Good programming addresses the way in which you write code and comments, ensuring code that is:
 - Clear and easy to read and review
 - Easy to maintain and modify
 - Robust (reduces maintenance cost)
 - Can be reused or adapted easily
 - Reduce the chance of logical or syntax errors





GPP Examples -1

- Include a header
 - Reviewing or updating a program is harder if you don't know the overall background or aim of the program.
- Include comments
 - Relate your code to the specification. Explain tricky or unusual code.
- Design program with a logical flow
 - Append or merge data before common processing
 - Avoid excessive sorting

GPP Examples -2

- Consistent and logical naming
 - Programs, datasets, variables, macros and formats are intrinsically easier to understand if their name suggests their function. (even temp variables can be labelled if it helps..)
- Consistent coding conventions
 - Explicitly state the input and output of a step
 - Indent related statements and use white space to aid readability
 - One statement per line
 - Close steps with run or quit
 - Remove unused code



GPP Examples -3

- Check logs
 - Not just Errors and warnings, but many notes are of interest.
- Program defensively
 - Ensure all possible data is handled appropriately (Check possible values from specifications and always consider missing values).
 - Do not program to the data

GPP and Project management

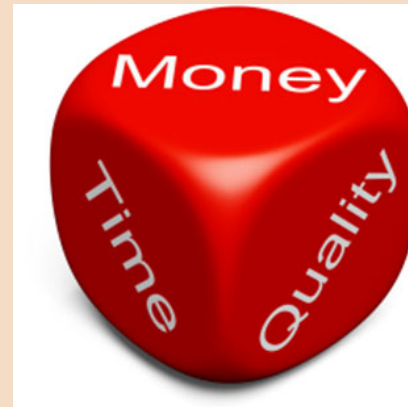
- Why is GPP important for project leads and managers?
 - Other programmers can easily pick up their work
 - Easier to review and QC code, pick up logical errors
 - Easier to reuse code from previous studies if GPP was used.
 - Easier to update code from comments
 - Less late working fixing someone else's *** code!





GPP and Project management

- Why is GPP important for project leads and managers?
 - Reduces resource needs
 - Increases resource flexibility
 - Improves quality
 - Fewer 'surprises'





Costs of not using GPP

- You are requested to make a change to specification and update your program.
- Choices are:
 - Quick fix that you can put in place without affecting timelines.
 - But may cause problems in making further updates
 - Make a more involved fix that delays timelines now.



Costs of not using GPP

- Pick up a program that has been written for another study similar to yours.
 - Spend twice as long as expected trying to modify the program to fit your study but do succeed.
- Calculated decision / compromise
 - How often will the code be reused?
 - Can I fix it later?
 - Can I still deliver to time and quality.



Costs of not using GPP

- Hi Mark
-
- This is taking me a bit longer than usual.
-
- My initial thought that all I would need to update was a simple update to *by variables*. However that wasn't the case. So I have created a separate program as the denominators for percentages are different to table 1 and the program has not been setup easily for it to change the calculations of the percentages.
-
- I know that this may not be ideal as the deadline is looming but I hope my program will be able to create all AE table by x and y. This will save time in the long run.



Technical Debt

- Most (all?) programs incur technical debt when first written.
 - “Shipping first time code is like going into debt” Ward Cunningham
 - ‘Interest ‘ on technical debt is the time taken to maintain/update your program.
- Intentional
 - Make a tactical or a strategic decision
 - You have to deliver
 - You know that the specification may wait but you can’t wait.
 - Training a junior programmer
- Unintentional
 - People made mistakes!
- Plan to reduce unintentional Technical debt by better GPP implementation.

How do I implement GPP?

- I can see the benefits!



- but how can improve GPP on my project?

Implementing GPP

- Documented Guidance
 - A set of rules for programmers to follow covering the practices that programmers should adopt and implement in their code
 - Clear
 - Concise
 - Accessible



- PhUSE GPP Board Guidelines

[http://www.phusewiki.org/wiki/index.php?
title=Good Programming Practice Guidance](http://www.phusewiki.org/wiki/index.php?title=Good_Programming_Practice_Guidance)



Implementing GPP

- Implementation Framework: Training
 - Include everyone
 - Give examples
 - Allow sufficient time
 - Consider global or local approach
 - Consider assigning champions for each office





Implementing GPP

- Implementation Framework: SOPs
 - Include reference to following GPP guidance in SOPs
 - More formal process
 - More effective with training as well





Implementing GPP

- Implementation Framework: Code review
 - Allows compliance to be assessed
 - Can aid development
 - Consider
 - When – Frequency? Dependent on project work?
 - Who – Manager? Programming Team Lead?
 - How – Code submitted? Chosen at random?
 - How to give feedback



Implementing GPP

- Implementation Framework: Goals and Objectives
 - Most formalised process
 - Code review and ongoing feedback essential – plan in time
 - Can help achieve better compliance if implemented well
 - Ensure objectivity





Automated checks for implementation

- Log checker
 - Many organisations scan logs for Notes of interest.
 - Logs should be free of messages of concern before QC.
 - E.G :
 - has more than one data set with repeats of by values
 - uninitialized
 - overwritten by
 - have been converted
 - All of these suggest potential errors in output if the data changes.
- Other checks
 - E.G Check data or programs against specifications or metadata.
 - Decide what works for you.
- Need to build into Programming process



Summary

- Following GPP is beneficial:
 - To the project – ensuring no unanticipated resource is needed
 - To the team – less time fixing programs
- Consider how GPP can be best implemented:
 - Factor in the time likely to be available for training and code review
 - Ensure expectations are clear



Questions?

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