

On the Naming of Methods: A Survey of Professional Developers

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Importance of Naming in Software Development:

- Naming source code identifiers (e.g., variables, types, methods, functions, classes) is critical in software engineering
- Good names **improve readability** and comprehension and **reduce maintenance costs**
- Proper names can convey the high-level meaning of tasks to developers

Standards and Practices:

- There are implied and documented standards for naming, including allowable words, grammatical structure, and composition of multi-word names.
- Despite the existence of these standards, **there is no broad understanding** of their actual usage and **acceptance among developers**.

“If you have a good name for a method, you do not need to look at the body” - Fowler et al. [1]

目的

- | The aim is to determine if the naming recommendations in literature reflect actual practice and align with developer opinions.
- | The research seeks to develop automated tools to assess the quality of method names, benefiting daily naming, renaming, and code review activities.
- **Survey of Professional Developers:**
 - The survey aims to gather statistically significant data to understand developer agreement and disagreement with these standards.

調査方法/ 研究デザイン

Assess developer attitudes towards each method naming standard based on programming experience and language background

- **Introduction:**

- Overview of the survey
- Estimated completion time: 10-15 minutes
- Ten questions related to method naming standards

TABLE I. METHOD NAMING STANDARDS. EACH PART OF THE STANDARDS AND THE ASSOCIATED SURVEY QUESTION.

#	Standard Name	Survey Question
1	Naming Style	The method name should use a standard naming style such as camelCase or underscore_case; Camel case uses upper case letters for each word. Underscore case uses " " to separate words.
2	Grammatical Structure	The method names with multiple words should be in a grammatically correct sentence structure.
3	Verb Phrase	The method name should always contain a verb(s) or verb phrase that refers to the behavior of the method.
4	Dictionary Terms	Developers should use only natural language dictionary words and/or familiar/domain-relevant terms.
5	Full Words	The method name should use full words rather than a single letter to clearly indicate the task of the method.
6	Idioms and Slang	The method name should not contain personal expressions, idioms, or unknown slang.
7	Abbreviations	The method name should contain only known or standard (i.e., recognized by others within the company) abbreviated terms. A poor abbreviation is one that has multiple possible expansions, interpretations or is not typically used within the system domain.
8	Acronyms	The method name should contain only known or standard (i.e., recognized by others in the company) acronyms. A poor acronym is one that has multiple possible expansions, interpretations or is not typically used within the system domain.
9	Prefix/Suffix	The method name should not contain a prefix/suffix that is a term from the system. This standard does not apply to languages such as C that do not have namespaces.
10	Length	The maximum number of words in a name should not be greater than (slider provided from 0-15)

調査方法/ 研究デザイン

● Survey Questions:

- Each question has examples of compliant and non-compliant method names
- Uses a Likert scale (Strongly agree, Agree, Disagree, Strongly disagree).
- Includes open-ended text boxes for additional comments

TABLE II. SURVEY DEMOGRAPHIC QUESTIONS

Question	Possible Responses
At your place of work, are there strict naming conventions in their coding standards?	Very Strict, Strict, No Standards, Slightly Strict, Not Strict.
Please give a short description of the naming coding standards you use.	Text box
Which programming language are you familiar with?	C++, Python, Java, C, C#, JavaScript, other language.
How many years of programming experience do you have?	Less than a year, 1 - 2 years, 3 - 4 years, 5 - 9 years, 10+ years, prefer not to say.

Question 1: Naming Style

	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)
When naming methods, the name should use a standard naming style such as camelCase or under_score; Camel case uses upper case letters for each word. Underscore uses "_" to separate words. (1)	☐	☐	☐	☐

Q1 Examples

Follows the standard:

getFullName(), getScriptState(), isValidName(), call_with_default(), garbage_collection() and check_static_allocation_size()

Does not follow the standard:

getfullName(), getscriptstate()

Q1 Comment Additional Comments:

調査方法/研究デザイン

Sent personalized email invitations to software professionals in large companies:

- Google
- IBM
- Intel
- Microsoft

Steps for analyzing participants' comments



Fig. 2. Steps for analyzing participants' comments on each standard

TABLE III. PROGRAMMING LANGUAGE USED BY 1164 PARTICIPANTS

Language	Number of Responses	Percentage of Participants Knowing the Language
C++	472	40.6%
C	484	41.7%
C#	589	50.7%
Python	635	54.7%
Java	697	50.0%
JavaScript	838	72.1%
Other Language	479	41.2%
Total responses	4194	
Avg # of Languages	4	

Research Question and 調査結果

RQ1: To what extent do software professionals support the method naming standards conveyed in the survey?

Broad Agreement:

- General agreement on the method **naming standards** presented in the survey

Disagreement Areas:

- **Grammatical Structure**: Some disagreement due to special cases
- **Verb Phrase**: Similar issues with special cases

with this form feel that adding the verb `get_`, `set_`, or `is_` is no longer necessary or useful. Thus, they advocate for instead of `getLength()` that `length()` is better, likewise `isEmpty()` should be just `empty()`. As programming languages evolve and change,

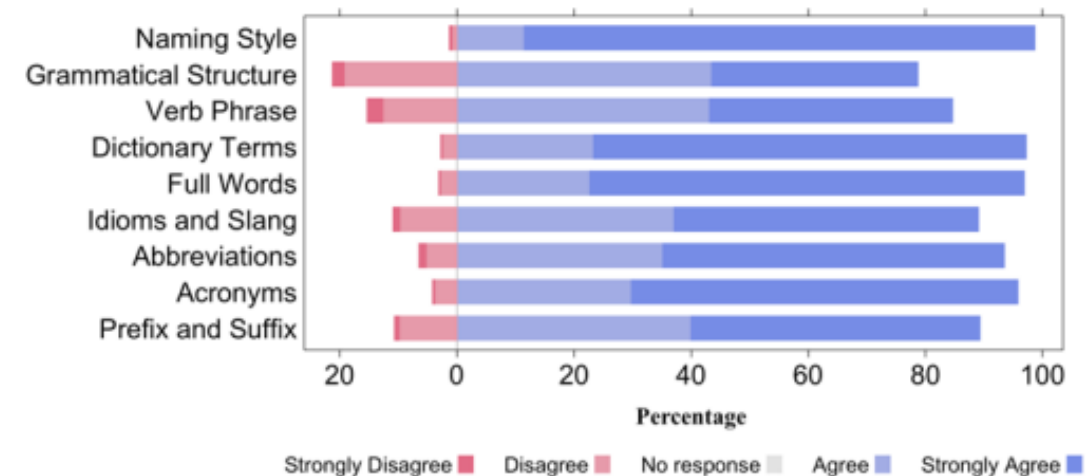


Fig. 4. Participants answers in a diverging stacked bar chart

Research Question and 調査結果

RQ2: Do years of programming experience impact how professionals respond to the survey questions?

Box plot analysis (Fig. 6) shows **consistent mean** and **median** agreement percentages across all experience levels

One exception: Significant difference (0.04 p-value) found in responses to the **abbreviation standard**.

Years of programming experience **do not significantly impact** responses to survey questions concerning each standard

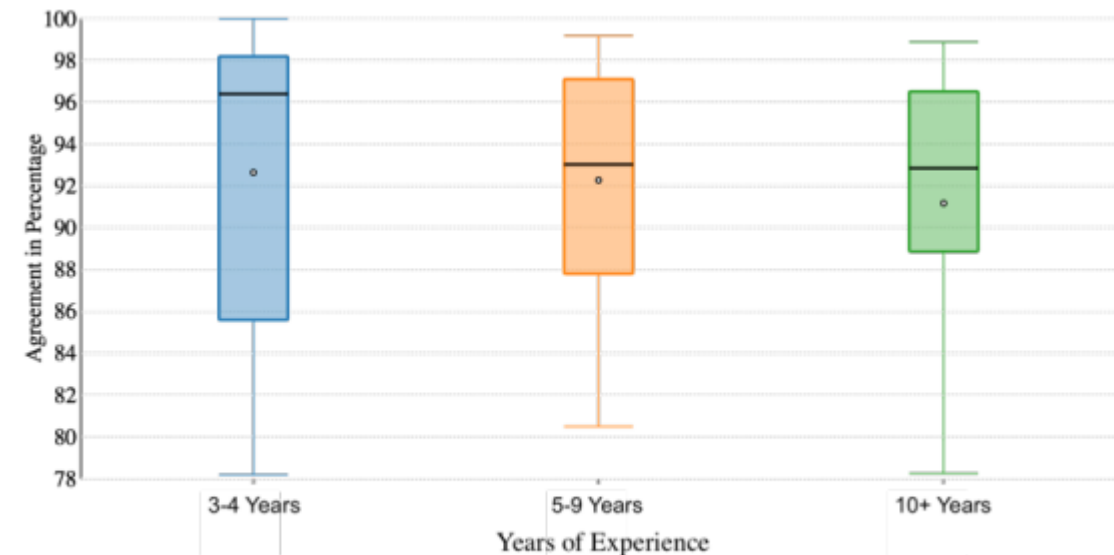


Fig. 6. Participants agreement across all the standards by experience level

Research Question and 調査結果

RQ3: Does the programming language used impact how professionals respond to the survey questions?

Outliers:

Naming Style:

- Java and C# experience.

Dictionary Terms:

- C programmers.

Verb Phrases:

- other languages' category

Programming language has minimal impact on responses to the survey questions.

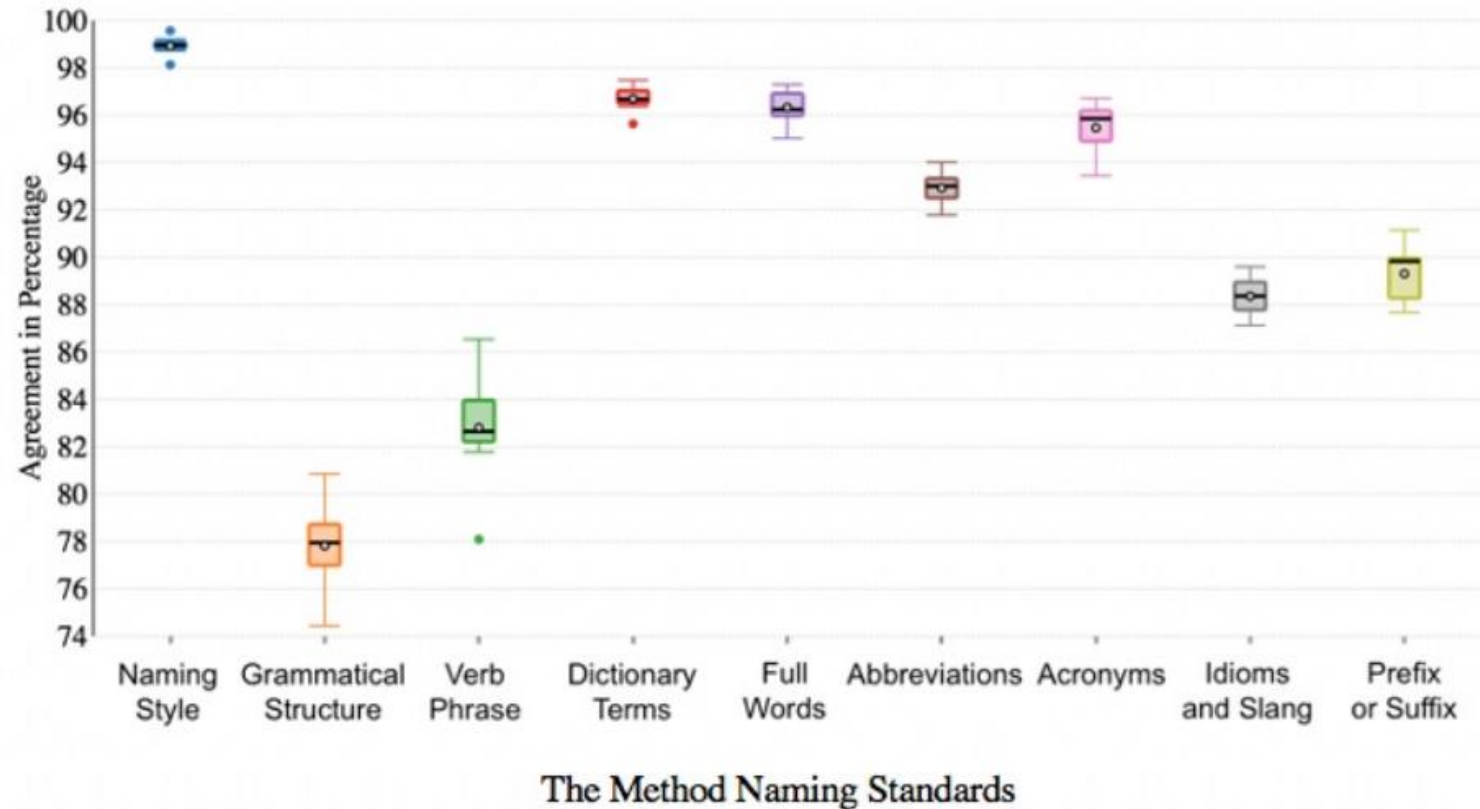


Fig. 7. Agreement percentages across programming languages per standard.

考察

Developer Agreement:

- Developers largely agree with the presented method naming standards
- Developers believe these standards positively impact code comprehension

Method naming standards are valid or at least widely accepted by developers

These standards can be used to construct automated tools to assess the quality of method names