Software Architecture Design Meetings at the Whiteboard

You are receiving this survey as our initial investigation identified you as a software architect. We ask you t spend about 30 minutes of your time. In this survey, we want to know your opinion regarding software architecture design meeting at the whiteboard.

Your participation is voluntary and confidential. You can withdraw at any time. We do not record any identifying information.

This survey is conducted by a joint team of <CONFIDENTIAL-INFORMATION>.

We plan to include the results of this survey in a scientific publication. Should you be interested in being informed about the outcome of this study or any resulting publication, you will be provided an opportunity to indicate this and provide us with your email address.

Please contact <CONFIDENTIAL-INFORMATION> if you have any questions or comments related to the study.

Thank you!

ELECTRONIC CONSENT
Please select your choice below. Selecting the "yes" option below indicates that: i) you have read and understood the above information, ii) you voluntarily agree to participate, and iii) you are at least 18 years old. If you do not wish to participate in the research study, please decline participation by selecting "No".

* Required

Consent

1. I consent to participate in this research study *

   Mark only one oval.

   - ◯ Yes
   - ◯ No

Skip to question 2

Background

Please answer the following questions to provide us with important background information that will help us calibrate our analyses.

2. How many years of experience do you have working in the software development industry (ex 0, 1, 2, 3...10...)? *

3. How many years of experience do you have working on the design of software architectures i industry (ex: 0, 1, 2, 3...10...)? *

4. When did you last work on designing or enhancing the design of a software architecture? *

   Mark only one oval.

   - Last year
   - Last six months
   - Last month
   - Last week

5. In which country do you currently reside and do your work? *

6. What is your highest educational qualification? *

Mark only one oval.

- ◯ Less than high school
- ◯ Graduated high school
- ◯ Trade/technical school
- ◯ Some college, no degree
- ◯ Associate degree
- ◯ Bachelor's degree
- ◯ Advanced degree (Master's, Ph.D., M.D.)

7. Please specify your gender identity: *

Mark only one oval.

- ◯ Male
- ◯ Female
- ◯ Prefer not to say
- ◯ Other: _____

Role of the Whiteboard

8. Some aspects of the design of software architecture lend themselves well to use of a whiteboard, for a variety of reasons. In the context of the overall nature of software architectu design projects, how important are design meetings at the whiteboard for: *

Mark only one oval per row.

	Very unimportant	Somewhat unimportant	Neutral	Somewhat important	Very importar
Clarifying the project as a whole	◯	◯	◯	◯	◯

Understanding (aspects of) the problem that the architecture is to solve					
Unearthing concerns that should be addressed architecturally					
Identifying the starting point for the eventual architectural solution					
Setting domain vocabulary					
Brainstorming my own ideas					
Brainstorming the ideas of others					
Making decisions					
Elaborating the high-level architecture					
Elaborating how the various components should interoperate					
Working out aspects of the architectural solution in detail					
Understanding constraints that limit the available design choices					
Managing the complexity of the project					
Helping developers retain their orientation / understanding of the direction of the project					
Exchanging relevant knowledge among team members					
Communicating already made					

decisions to the rest of the team					
Facilitating the eventual implementation					
Explaining how the system works / is anticipated to work					
Delineating the scope of work for the sub-teams that will be working on implementing the design					
Overall: how important are whiteboard design meetings to successful architectural design?					

9. Considering these same factors, but now constrained to the last three software architecture design meetings at the whiteboard in which you participated, how frequently did the followin take place: *

Mark only one oval per row.

	All the time	Regularly	Occasionally	Once or twice	Never
Clarifying the project as a whole					
Understanding (aspects of) the problem that the architecture is to solve					
Unearthing concerns that should be addressed architecturally					
Identifying the starting point for the eventual architectural solution					
Setting domain vocabulary					
Brainstorming my own ideas					
Brainstorming the ideas of others					

Making decisions					
Elaborating the high-level architecture					
Elaborating how the various components should interoperate					
Working out aspects of the architectural solution in detail					
Understanding constraints that limit the available design choices					
Managing the complexity of the project					
Helping developers retain their orientation / understanding of the direction of the project					
Exchanging relevant knowledge among team members					
Communicating already made decisions to the rest of the team					
Facilitating the eventual implementation					
Explaining how the system works / is anticipated to work					
Delineating the scope of work for the sub-teams that will be working on implementing the design					
Overall: how often do you believe it is necessary to engage in whiteboard software architecture design meetings?					

Experience levels of team members

In a typical whiteboard software architecture design meeting, it is possible that the experience levels o team members differ. We would like you to reflect on your past experiences with colleagues of varying levels of experience in these meetings.

10. With respect to novice participants in software architecture design meetings, please state your level of agreement with each of the following: *

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
It is important to include novices in whiteboard software architecture design meetings because they are not biased by previous experiences/meetings					
Including novices in whiteboard software architecture design meetings is important, because the ideas that they contribute are not bound by preconceived notions of what is right/wrong					
Novices are better at revealing blind spots than experienced architects, unearthing assumptions that experienced architects make that might not hold					
With novices, the team has to provide more context and offer more explanations during whiteboard software design meetings					
When novices are present, the team has to go into aspects of the design that it had not intended to					

focus on, impacting the flow of meetings					
Novices are inflexible in that, when they offer up an idea, they cannot let it go and thereby lessen the ability to have a productive meeting					
Novices do not understand the importance of architecture design					
Novices do not consider all aspects necessary to design a good architectural solution					
Novices have difficulty in understanding the problem and 'seeing' the overall solution					
Novices are afraid to speak up in a whiteboard software architecture design meeting					
Novices tend to be quiet, listening in and learning from others					
Overall: it is important to include novices in whiteboard software architecture design meetings					

11. With respect to experienced participants in software architecture design meetings, please state your level of agreement with each of the following: *

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Experienced architects understand the whole context of the design project					

One needs less preparation for meetings with more experienced architects					
Experienced architects are able to work with larger abstractions and have a facility to discuss those abstractions					
Experienced architects tend to go to the whiteboard first (as in, design at the whiteboard first before using other means)					
Experienced architects think carefully before making a comment in a meeting					
Experienced architects tend to talk/explain a lot					
Experienced architects are important in a meeting to avoid making the wrong decisions					
Experienced architects push edge cases, because they are aware of their past mistakes in this regard					
The quality of the architecture is influenced by the participation of experienced architects					
In a whiteboard software architecture design meeting with experienced architects, the meeting commences more quickly, but often rushes to conclusions based on others trusting the experience of the more experienced person					
It is difficult to reach agreement					

with experienced architects					
In a whiteboard design meeting with experienced architects, it is almost as if they can read each other's minds					
Experienced architects promote an environment of studying tradeoffs among ideas, leading to a more productive meeting					
Overall: it is important to include experienced architects in whiteboard software architecture design meetings					

12. Naturally, most whiteboard software architecture design meetings involve novice and experienced participants. Please state your level of agreement with each of the following: *

Mark only one oval per row.

	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
A mixed team of novice and experienced architects is good to avoid bias toward adopting past solutions					
A mixed team of novice and experienced architects is good because novices and experienced architects complement the background of one another					
With a mixed team, the final solution is better because of the different backgrounds of the participants					
A team of mixed levels of					

experience is better for brainstorming					
Diversity is important for a mixed team; not only in levels of experience, but also in terms of different areas of expertise					
A mixed team is important for education; those who have less experience learn more when those who have more experience are present					
A mixed team is good for having insights, because novices are unafraid to ask questions that (perhaps inadvertently) lead to insights that would have otherwise been glossed over					
Experienced architects can ask questions that others cannot in a whiteboard software design meeting					
A mixed team is good because the participants add questions that one sometimes does not ask oneself					
A mixed team is important to sharing the technical view of the decisions with the team					
Experienced architects can undermine the enthusiasm of novices in a meeting					
For some complex design problems, novice architects are less welcome because they are seen as likely no being able to have many insights					

With experienced architects, you do not have to spend part of the whiteboard design meeting explaining the solution; the meeting focuses more on each person's contributions in their respective area of expertise and their understanding of the problem as a whole					
In a whiteboard design meeting with experienced architects, the whiteboards exhibit a lack of detail because the experienced architects know the details and assume everyone does					
In a mixed meeting, the experienced architect is looked upon to lead the meeting					
Experienced architects are important to speed up decision making in whiteboard software architecture design meetings					
Discussions among experienced architects usually flow more quickly, but often rush to conclusions					
With only experienced software architects, the solution that emerges is of better quality than with a mixed team					
Overall: it is important to include both novices and experienced software architects in whiteboard software architecture design meetings					

13. Considering just experienced architects that you know, please rank the top 5 most valued qualities that you believe they should exhibit. *

Check all that apply.

- [ ] Ability to facilitate fruitful discussions
- [ ] Ability to communicate with the team
- [ ] Ability to diffuse interpersonal situations
- [ ] Ability to both introduce ideas and serve as a sparring partner for them
- [ ] Posses a foundation of architectural knowledge (patterns, methods, tools ,…)
- [ ] Depth of knowledge in a particular area of specialty (domain, technology, …)
- [ ] Breadth of knowledge across domains, applications, abstractions, …
- [ ] Experience in having designed several architectures in the past
- [ ] Understanding of the architecture of other existing systems
- [ ] Experience in having participated in many different projects
- [ ] Awareness of technology trends
- [ ] Understand failure cases
- [ ] Many hours of hands-on software development
- [ ] Ability to interact positively with the project manager
- [ ] Ability to stop the team from going in the wrong direction
- [ ] Ability to see and analyze tradeoffs
- [ ] Ability to mentor others

Other: ☐ _____

Taking results from whiteboard software architecture design meetings into the project

Once a whiteboard software architecture design meeting commences, the participants disperse. Exactly how, and even if, what happened at the whiteboard is explicitly documented for later consumption is up for debate. Sometimes it happens. Sometimes it does not. Sometimes it involves much effort to actually document what happened. Sometimes it is just a photograph. Within this context, please consider the following questions.

14. Does your organization document what happens during whiteboard software architecture design meetings? *

Mark only one oval.

- ◯ Always
- ◯ Most of the time
- ◯ About half the time
- ◯ Infrequently
- ◯ None

15. If your organization does document what happens during whiteboard software architecture design meetings, even if infrequently, what form of documentation is used (check all that apply). *

Check all that apply.

- ☐ Wiki pages
- ☐ We leave the whiteboard up ("Do not erase")
- ☐ Notes taken during the meeting by one or more participants
- ☐ Notes produced/polished after the meeting
- ☐ Powerpoint slides
- ☐ Photo(s) of the whiteboard
- ☐ Photo(s) with additional notes
- ☐ Informal record of decisions
- ☐ Informal record of decisions, alternatives, and rationale for choices
- ☐ Architecture Decision Records (ADRs)
- ☐ UML diagrams
- ☐ Flow charts
- ☐ User stories
- ☐ Use cases
- Other: ☐ _____

16. When whiteboard software architecture design meetings are documented, why does your organization do so? Please rank the top 5 most important reasons. *

Check all that apply.

- [ ] Participants forget
- [ ] Participants sometimes second-guess what they did
- [ ] Different participants have different beliefs regarding the outcomes of a meeting; documenting helps disambiguate
- [ ] Serve as a starting point for follow-up discussion in future meetings
- [ ] Retain as evidence for later of the decisions that were made
- [ ] Enable reuse of the design ideas in other design projects
- [ ] Communicate the outcomes to others on the project
- [ ] Use later to educate new people on the project
- [ ] Train the team on the design
- [ ] Validate in detail whether the design ideas indeed can work as intended
- [ ] Include as part of the design that we are handing off to the customer (so they can do the implementation work)
- [ ] Present a preliminary solution to the customer
- [ ] Support future job promotions of participants

Other: [ ] _____

17. No design is ever perfect, and so it is with software architecture designs that are produced a the whiteboard. Things change, especially when it comes to implementation time. Thinking back to your last three projects, please rank the top 5 kinds of changes you experienced in terms of how disruptive they were to the project when the implementation revealed the architecture as designed needed to change: *

Check all that apply.

- [ ] Driving scenarios
- [ ] Overall architectural solution
- [ ] A small handful of components in the architecture
- [ ] Interfaces of major components in the architecture
- [ ] Format of messages connecting various parts of the architecture
- [ ] Detailed modules inside architectural components
- [ ] Database schema
- [ ] Key algorithms
- [ ] Implementation details

Other: ☐ _____

18. Different changes are driven by differences forces. Please rank the top 5 key driving forces c major change at implementation time: *

Check all that apply.

- [ ] The original meeting was not conducted very well and thus not effective
- [ ] We discovered a better solution than the original we devised at the whiteboard
- [ ] The project is Agile, and thus had to respond to new circumstances
- [ ] Lack of having documented what we did at the whiteboard
- [ ] Difficulty in mapping the high-level solution to actual code
- [ ] Multi-dimensionality of the problem – qualities that were not considered (or merely lightly considere during the whiteboard meeting are negatively affected by the planned solution
- [ ] Certain aspects of the solution were over-simplified and turn out to be more complex
- [ ] Certain predictions of how the architecture would behave did not hold up
- [ ] Team made false assumptions
- [ ] Performance
- [ ] Scalability
- [ ] Reliability
- [ ] Technology/platform limitations
- [ ] Customer requirements changed midstream
- [ ] Team misunderstood the architectural design
- [ ] Social problems within the team

Other: [ ] _____

19. Thinking of your last three whiteboard software architecture design meetings that were less than ideal from your perspective, please choose the top 5 items that were missing from the discussion that should have been talked about: *

Check all that apply.

- [ ] Agenda for the meeting
- [ ] Dependencies among the various whiteboard sketches
- [ ] Metrics that delineate 'success' of the architectural design
- [ ] Sufficient information about the problem to design the solution
- [ ] Understanding of the relative priority of various design considerations
- [ ] An overview of the project
- [ ] Certain requirements
- [ ] Context diagram
- [ ] Interfaces among the Components
- [ ] Details about the current implementation
- [ ] Details about the envisioned implementation
- [ ] Structure of the messages exchanged by the components
- [ ] Validity of assumptions about decisions, as to whether they hold up at implementation time
- [ ] Test cases governing the architectural design

Other: ☐ _____

A few closing questions

20. Have you ever used digital whiteboard tools in a software architecture design meeting? *

Mark only one oval.

- ◯ Yes
- ◯ No

21. Do you currently use digital whiteboard tools in a software architecture design meeting? *

Mark only one oval.

- Yes
- No

22. Would you like to use digital whiteboard tools in a software architecture design meeting? *

Mark only one oval.

- Yes
- No

23. Reflecting on everything the survey has talked about, what would be your two key pieces of advice to software architects running future whiteboard software architecture design meetings: *

24. Any final thoughts?

Email Information (optional)

25. Please enter your e-mail if you would like to be entered in the raffle. We will not link your e-m address to your survey responses, nor will we publish your e-mail address in any which way.Participation in the raffle is voluntary. If you do not wish to participate, please go ahead and submit the survey below. If you do wish to participate, please enter your e-mail address and then submit the survey.We thank you for your participation in this research!