Survey for the Smart Contract Maintenance Issues on Ethereum

Please note that all the questions in this survey are for the Ethereum platform, we do not consider other smart contract platforms, e.g., EOS.

* Required

1. 1. Are you a professional smart contract developer? *

   Mark only one oval.

   - ◯ Yes
   - ◯ No

2. 2. Are you involved in open source software development efforts? *

   Mark only one oval.

   - ◯ Smart Contract Projects only
   - ◯ Traditional Projects Only
   - ◯ Smart Contract Projects and Traditional Projects
   - ◯ None of them

3. 3. Please describe your main role in developing smart contracts? *

   Mark only one oval.

   - ◯ Testing
   - ◯ Development
   - ◯ Management
   - ◯ Other: _____

4. 4. How many years of experience do you have in smart contract development/testing/project management/others (decimals ok)? *

_____

5. 5. What is your current country of residence? *

_____

6. 6. How do you obtain required knowledge about smart contracts? (Multiple Choice)

Check all that apply.

- [ ] Documentation, e.g., Solidity Documentation, Ethereum Yellow Paper
- [ ] Books
- [ ] Blogs
- [ ] Journal / Conference Paper
- [ ] Video Tutorials
- [ ] Face to to Face Tutorials
- [ ] Q&A sites, e.g., Stack Overflow

Other: ☐ _____

7. 7. Do you believe smart contracts have higher security requirements than traditional, centralized apps, e.g., mobile apps, web apps?

If you have any comments, please choose Other

Mark only one oval.

- ◯ Higher security requirements
- ◯ Similar security requirements but different
- ◯ Less security requirements
- ◯ Other: _____

8. 8. How do you test / debug your smart contracts for security and scalability? (Multiple Choices)

Check all that apply.

- [ ] Unit testing
- [ ] Functional and Integration testing
- [ ] Using static analysis tools, e.g., Oyente, Mythril, Securify, Contractfuzzer
- [ ] Using formal verification tools, e.g., KEVM
- [ ] Code review
- [ ] Ethereum Test net
- [ ] Other: _____

9. 9. How do you maintain your deployed smart contracts? (Multiple Choices)

Check all that apply.

- [ ] I never maintain smart contracts which are deployed.
- [ ] I discard the old contracts directly, and deploy new contracts.
- [ ] I use the selfdestruct function to destruct the old contracts, and then deploy new replacement contracts.
- [ ] I use upgradeable smart contracts.
- [ ] Other: _____

10. 10. Have you developed an upgradeable smart contract before?

Upgradeable smart contracts can be realized by using DELEGATECALL, for an example, please refer to Openzeppelin library, see: https://docs.openzeppelin.com/learn/upgrading-smart-contracts

Mark only one oval.

- ◯ Yes (Go to Question 12)
- ◯ No (Go to Question 11)

11. 11. Why don't you develop upgradeable smart contracts? (Multiple Choices)

Check all that apply.

- [ ] No necessity, e.g., no business requirements.
- [ ] I never maintain smart contracts which have been deployed
- [ ] I don't know how to develope upgradeable smart contracts
- [ ] Developing upgradeable smart contracts can increase development cost
- [ ] Developing upgradeable smart contracts can increase security risks
- [ ] Other: _____

12. 12. Do you believe smart contracts are harder to maintain than traditional centralized apps, e.g., mobile apps, web apps?

If you have any comments, please choose Other

Mark only one oval.

- ◯ More effort
- ◯ Similar effort but different
- ◯ Less effort
- ◯ Other: _____

13. 13. Do you have the following maintenance issues for your smart contracts? (Multiple Choices)

Check all that apply.

- [ ] The immutability features.
- [ ] Lack of tools / techniques to audit code.
- [ ] Lack of useful documentations
- [ ] Lack of useful standard
- [ ] Lack of useful library, APIs
- [ ] Lack of useful reference code
- [ ] Solidity scales poorly
- [ ] The gas system is not easy to handle, e.g., transaction failure due to out of gas
- [ ] The memory issues of smart contract is not easy to handle
- [ ] The storage issues of smart contract is not easy to handle
- [ ] Debugging / testing of smart contracts is not easy
- [ ] Other: _____

14. 14. Do you think the following issues can increase the difficulty of maintenance? (Multiple Choices)

Check all that apply.

- [ ] Presence of misbehaving miners
- [ ] Ethereum might add new functions through hard fork, which might affect the currents contracts running on the blockchain
- [ ] Smart contracts can call other contracts. However, the callee contract might change, e.g., selfdestructed
- [ ] The poor readability of some open sourced smart contracts.
- [ ] More financially attractive compared to traditional software, thus leading to more attacks
- [ ] Ethereum has many limitations, e.g., speed of transaction execution, limited stack size.
- [ ] Solidity and Ethereum might have many potential bugs
- [ ] Smart Contracts run on a permission-less network
- [ ] Other: _____

15. 15. Are you satisfied with the current ecosystems of smart contracts, e.g., platforms for sharing data / information, enough tools, documents, standards?

If you have any comments, please choose Other

Mark only one oval.

- ◯ Very Satisfied
- ◯ Satisfied
- ◯ Neutrality
- ◯ Unsatisfied
- ◯ Very Unsatifsfied
- ◯ Other: _____

16. 16. Have you ever used the code of other smart contracts from the following platforms (Multiple Choices)

Check all that apply.

- [ ] I never use the code from other smart contracts
- [ ] Stack Overflow / Stack Exchanges
- [ ] Github
- [ ] Etherscan
- [ ] Solidity Documents
- [ ] Code from Google Search, or other search engine

Other: [ ] _____

17. 17. Do you think the following kinds of tools / resources are good enough for smart contract development? (Please give a score for them)

Mark only one oval per row.

	1 (Very bad)	2 (Bad)	3 (Neutrality)	4 (Good)	5 (Very Good)
Development Environments (IDE)	⬭	⬭	⬭	⬭	⬭
Testing tools	⬭	⬭	⬭	⬭	⬭
Security Audit tools	⬭	⬭	⬭	⬭	⬭
Smart Contract Exploer, e.g., Etherscan	⬭	⬭	⬭	⬭	⬭
The Q&A website, e.g., Stack Overflow	⬭	⬭	⬭	⬭	⬭
Comments from Public, e.g., DApp Store, Github	⬭	⬭	⬭	⬭	⬭
Community Support	⬭	⬭	⬭	⬭	⬭
Solidity and Ethereum Documentation	⬭	⬭	⬭	⬭	⬭

18. 18. Do you think smart contracts are suitable for developing a large scale project?

If you have any comments, please choose Other

Mark only one oval.

- ◯ Yes
- ◯ Sometimes
- ◯ No
- ◯ Other: _____

19. 19. Do you think it is necessary to have a Dapp store like Google App Store, IOS Store for smart contracts?

If you have any comments, please choose Other

Mark only one oval.

- ◯ Yes
- ◯ Sometimes
- ◯ No
- ◯ Other: _____

20. 20. Currently, there are many technologies that can improve the security of smart contracts. Do you think it is important to merge them into EVM / Ethereum / IDE?

If you have any comments, please choose Other

Mark only one oval.

- ◯ All of them
- ◯ Some of them
- ◯ None of them
- ◯ Other: _____

21. 21. Do you have any final comments or questions for us? (Optional)

22. As an appreciation of your time and valuable inputs, we will give out 50 USD Amazon vouchers to two randomly selected participants. If you want to enter the raffle, please kindly enter your email. (Optional)