

TechRate  
September, 2022



# SMART CONTRACTS SECURITY AUDIT REPORT



Techrate\_audits



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# Audit Details



Audited project

**i-Vault**



Deployer address

**Not deployed**



Client contacts:

**i-Vault team**



Blockchain

**Not provided**



Project website:

**Not provided**

# Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

# Background

**TechRate was commissioned by i-Vault to perform an audit of smart contracts on commit:**

<https://github.com/kek-chain/i-Vault/commit/66fdb163de9cd80b2d3a4f065cc66d1b7699870f>

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

# Issues Checking Status

| Issue description   | Checking status |
|---|-----------------|
| 1. <b>Compiler errors.</b>  | Passed          |
| 2. <b>Race conditions and Reentrancy. Cross-function race conditions.</b> | Passed          |
| 3. <b>Possible delays in data delivery.</b>                               | Passed          |
| 4. <b>Oracle calls.</b>   | Passed          |
| 5. <b>Front running.</b>  | Passed          |
| 6. <b>Timestamp dependence.</b>   | Passed          |
| 7. <b>Integer Overflow and Underflow.</b>                                 | Passed          |
| 8. <b>DoS with Revert.</b>  | Passed          |
| 9. <b>DoS with block gas limit.</b>                                       | Low issues      |
| 10. <b>Methods execution permissions.</b>                                 | Passed          |
| 11. <b>Economy model of the contract.</b>                                 | Passed          |
| 12. <b>The impact of the exchange rate on the logic.</b>                  | Passed          |
| 13. <b>Private user data leaks.</b>                                       | Passed          |
| 14. <b>Malicious Event log.</b>   | Passed          |
| 15. <b>Scoping and Declarations.</b>                                      | Passed          |
| 16. <b>Uninitialized storage pointers.</b>                                | Passed          |
| 17. <b>Arithmetic accuracy.</b>   | Passed          |
| 18. <b>Design Logic.</b>  | Low issues      |
| 19. <b>Cross-function race conditions.</b>                                | Passed          |
| 20. <b>Safe Open Zeppelin contracts implementation and usage.</b>         | Passed          |
| 21. <b>Fallback function security.</b>                                    | Passed          |

# Security Issues

## ✓ High Severity Issues

No high severity issues found.

## ✓ Medium Severity Issues

No medium severity issues found.

## ✓ Low Severity Issues

### 1. Out of gas

#### Issue:

- The function `deployVaults()`, `fundVaults()`, `indexOfWallet()`, `balanceOfVaults()` and `batchWithdrawRange()` uses the loop to iterate through `vaultMap` list. It could be aborted with `OUT_OF_GAS` exception if there will be a big number of `index` or `receiverCount`.

#### Recommendation:

Check that the number is not too big.

### 2. Conversion issues

#### Issue:

- Contracts have many unnecessary conversions to `uint`, `uint256`, `address`.

#### Recommendation:

Revise conversions to keep only really needed ones.

### 3. Overcount issue

#### Issue:

- `balanceOfVaults()` and `batchWithdrawRange()` function don't check `_to(toWallet)` value to be less than `receiverCount`.

#### Recommendation:

Add checking of `aim` value to be less than total count.

## Notes:

- deployVaults() function returns only last address.
- fundVaults() function allow funds only from beginning.
- Vault's transfer function replaces receiver address with \_community\_ and \_development addresses.
- Vault's withdraw functions withdraws only \_community and \_development parts.

## Owner privileges (In the period when the owner is not renounced)

- VaultFactory:
  - Authorized address can fund vaults and call vault's transfer function.
- Vault:
  - Authorized address can change teamDonationMultiplier.
  - Authorized address can change \_community and \_development wallets.
  - Authorized address can change transfer function.

# Conclusion

Smart contracts contain low severity issues! The further transfers and operations with the funds raise are not related to this particular contract.

Security score: 78.

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## *TechRate note:*

*Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.*