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Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Fayre

Audit

Security Assessment
22. February, 2022

For

fayre

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Version	Date	Description
1.0	22. February 2022	• Layout project • Automated- /Manual-Security Testing • Summary

Network
Polygon

Website
https://www.fayre.com/

Telegram
https://t.me/Fayre

Twitter
https://twitter.com/fayrelabs

Youtube
https://www.youtube.com/c/fayre

LinkedIn
https://www.linkedin.com/company/fayre/

Description

An NFT community for brands and fans
Part NFT marketplace, part fan activation hub. We make tools that allow creators and brands to establish and manage fan clubs, which gives NFTs unlimited function & purpose in real life, online and in virtual worlds.

Project Engagement

During the 18th of February 2022, **Fayre Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo

Contract Link

v1.0

- Github
  - https://github.com/fayrelabs/fayre-marketplace-blockchain/blob/main/contracts/FayreMembershipCard721.sol
  - Commit: c5c40fa0a5fa61fe96b47bf453887d441ac15afc

  - https://github.com/fayrelabs/fayre-marketplace-blockchain/blob/main/contracts/FayreStandardCard.sol
  - Commit: 81c80824e0f6798a2ee4b993950ac6cfc66b1d52

  - https://github.com/fayrelabs/fayre-marketplace-blockchain/blob/main/contracts/FayrePremiumOGCard.sol
  - Commit: 81c80824e0f6798a2ee4b993950ac6cfc66b1d52

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon aspossible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
    i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
    ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
    iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.

2. Testing and automated analysis that includes the following:
    i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
    ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.

3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.

4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

Dependency / Import Path	Count
@chainlink/contracts/src/v0.8/interfaces/AggregatorV3Interface.sol	1
@openzeppelin/contracts-upgradeable/access/OwnableUpgradeable.sol	1
@openzeppelin/contracts-upgradeable/token/ERC721/extensions/ERC721BurnableUpgradeable.sol	1
@openzeppelin/contracts-upgradeable/token/ERC721/extensions/ERC721EnumerableUpgradeable.sol	1

Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

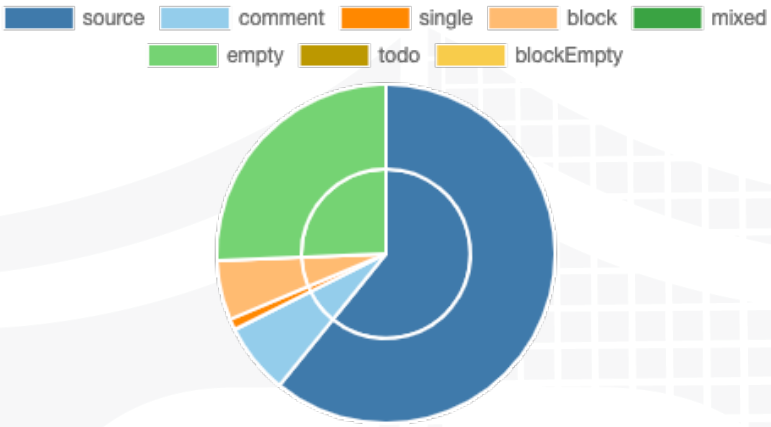
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

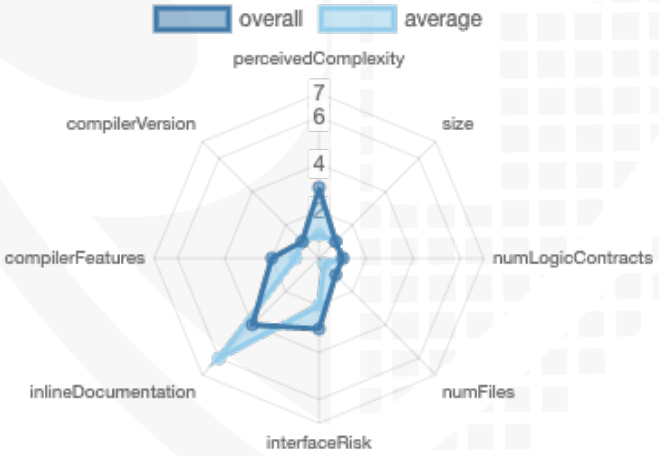
File Name	SHA-1 Hash
contracts/FayrePremiumOGCard.sol	bf72d347c57ab9013a5f52a1547a8dffc52c41b0
contracts/FayreStandardCard.sol	233ffcaa043ff55fc61247269c697f6ed9609065
contracts/FayreMembershipCard721.sol	e085d2b3338a6fffd6d8b0cf3be0af3cb74541da

Metrics

Source Lines
v1.0



Risk Level
v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	2	0	0	1

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Version	Public	Payable
1.0	22	1

Version	External	Internal	Private	Pure	View
1.0	18	25	0	0	2

State Variables

Version	Total	Public
1.0	16	11

Capabilities

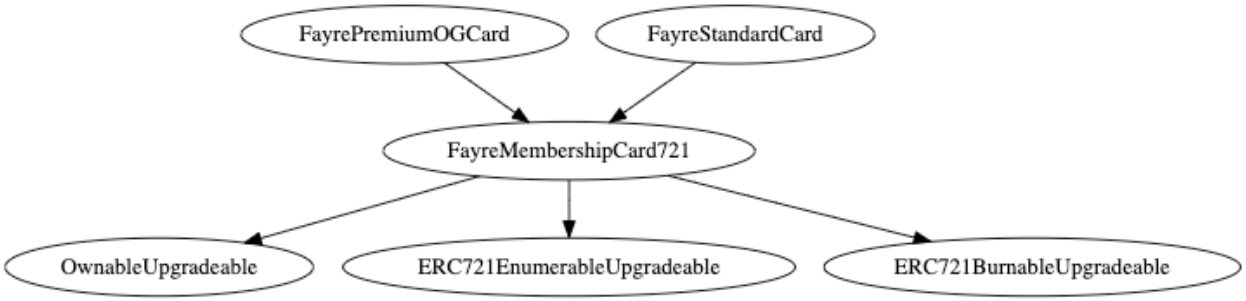
Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	`0.8.9`		`yes`		

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/ Create/ Create2

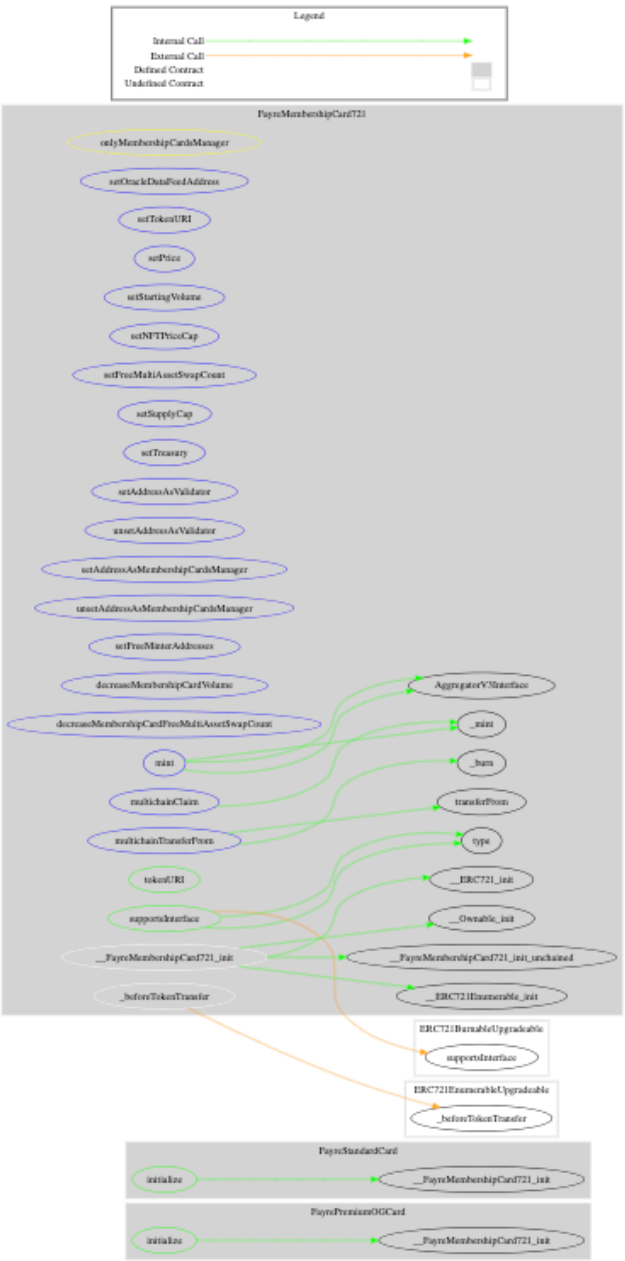
1.0	`yes`	`yes`				

Inheritance Graph

v1.0



CallGraph
v1.0



Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

Correct implementation of Token standard

Functions check

[✓] balanceOf(address) is present
    [✓] balanceOf(address) -> () (correct return value)
    [✓] balanceOf(address) is view
[✓] ownerOf(uint256) is present
    [✓] ownerOf(uint256) -> () (correct return value)
    [✓] ownerOf(uint256) is view
[✓] safeTransferFrom(address,address,uint256,bytes) is present
    [✓] safeTransferFrom(address,address,uint256,bytes) -> () (correct return type)
    [✓] Transfer(address,address,uint256) is emitted
[✓] safeTransferFrom(address,address,uint256) is present
    [✓] safeTransferFrom(address,address,uint256) -> () (correct return type)
    [✓] Transfer(address,address,uint256) is emitted
[✓] transferFrom(address,address,uint256) is present
    [✓] transferFrom(address,address,uint256) -> () (correct return type)
    [✓] Transfer(address,address,uint256) is emitted
[✓] approve(address,uint256) is present
    [✓] approve(address,uint256) -> () (correct return type)
    [✓] Approval(address,address,uint256) is emitted
[✓] setApprovalForAll(address,bool) is present
    [✓] setApprovalForAll(address,bool) -> () (correct return type)
    [✓] ApprovalForAll(address,address,bool) is emitted
[✓] getApproved(uint256) is present
    [✓] getApproved(uint256) -> () (correct return value)
    [✓] getApproved(uint256) is view
[✓] isApprovedForAll(address,address) is present
    [✓] isApprovedForAll(address,address) -> () (correct return value)

```
    [✓] isApprovedForAll(address,address) is view
[✓] supportsInterface(bytes4) is present
    [✓] supportsInterface(bytes4) -> () (correct return value)
    [✓] supportsInterface(bytes4) is view
[✓] name() is present
    [✓] name() -> () (correct return value)
    [✓] name() is view
[✓] symbol() is present
    [✓] symbol() -> () (correct return value)
[✓] tokenURI(uint256) is present
    [✓] tokenURI(uint256) -> () (correct return value)

Events check
[✓] Transfer(address,address,uint256) is present
    [✓] parameter 0 is indexed
    [✓] parameter 1 is indexed
    [✓] parameter 2 is indexed
[✓] Approval(address,address,uint256) is present
    [✓] parameter 0 is indexed
    [✓] parameter 1 is indexed
    [✓] parameter 2 is indexed
[✓] ApprovalForAll(address,address,bool) is present
    [✓] parameter 0 is indexed
    [✓] parameter 1 is indexed
```

Write functions of contract v1.0

- approve
- burn
- decreaseMembershipCardFreeMu...
- decreaseMembershipCardVolume
- initialize
- mint
- multichainClaim
- multichainTransferFrom
- renounceOwnership
- safeTransferFrom
- safeTransferFrom
- setAddressAsMembershipCards...
- setAddressAsValidator
- setApprovalForAll
- setFreeMinterAddresses
- setFreeMultiAssetSwapCount
- setNFTPriceCap
- setOracleDataFeedAddress
- setPrice
- setStartingVolume
- setSupplyCap
- setTokenURI
- setTreasury
- transferFrom
- transferOwnership
- unsetAddressAsMembershipCar...
- unsetAddressAsValidator

Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	✓	✓	✓

Comments:

v1.0

- Everybody can mint new nfts

Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock	✓	✓	✗
Deployer cannot burn	✓	✓	✓

Comments:

v1.0

- Deployer can lock functions
  - mint
    - By setting priceUSD to high

Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	–	–	–

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verfified / Checked	✓
Partly Verified	⚑
Unverified / Not checked	✗
Not available	–

Modifiers and public functions

v1.0

```
setOracleDataFeedAddress
    onlyOwner
setTokenURI
    onlyOwner
setPrice
    onlyOwner
setStartingVolume
    onlyOwner
setNFTPriceCap
    onlyOwner
setFreeMultiAssetSwapCount
    onlyOwner
setSupplyCap
    onlyOwner
setTreasury
    onlyOwner
setAddressAsValidator
    onlyOwner
unsetAddressAsValidator
    onlyOwner
setAddressAsMembershipCardsManager
    onlyOwner
unsetAddressAsMembershipCardsManager
    onlyOwner
setFreeMinterAddresses
    onlyMembershipCardsManager
decreaseMembershipCardVolume
    onlyMembershipCardsManager
decreaseMembershipCardFreeMultiAssetSwapCount
    onlyMembershipCardsManager
mint 💰
multichainTransferFrom
multichainClaim
```

Comments

- Deployer can set following state variables without any limitations
  - priceUSD
  - startingVolume
  - nftPriceCap
  - freeMultiAssetSwapCount
  - supplyCap

- Deployer can enable/disable following state variables
  - isValidator
  - isMembershipCardsManager

- OnlyMembershipCardsManager can enable/disable following state variables
  - isFreeMinter

- OnlyMembershipCardsManager set following state variables without any limitations
  - membershipCardsData[tokenId].volume
  - membershipCardsData[tokenId].freeMultiAssetSwapCount

- Deployer can set following addresses
  - oracleDataFeed
  - _tokenURI
  - treasuryAddress

Please check if an OnlyOwner or similar restrictive modifier has been forgotten.

Source Units in Scope
v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝	contracts/FayrePremiumOGCard.sol	1	————	10	10	7	1	7	————
📝	contracts/FayreStandardCard.sol	1	————	10	10	7	1	7	————
🎨	contracts/FayreMembershipCard721.sol	1	————	242	242	157	17	135	💰🧮🔮
📝🎨	**Totals**	**3**	————	**262**	**262**	**171**	**19**	**149**	💰🧮🔮

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

AUDIT PASSED

Critical issues

No critical issues

High issues

No high issues

Medium issues

No medium issues

Low issues

Issue	File	Type	Line	Description
#1	FayreMembershipCard720	Missing Zero Address Validation (missing-zero-check)	59, 87	Check that the address is not zero
#2	FayreMembershipCard721	Local variables shadowing	213	Rename the local variables that shadow another component

Informational issues

Issue	File	Type	Line	Description

#1	FayreMembershipCard721	Require messages are missing	All require statements	Require messages are aliased to comments in require statements, but those are not helpful for investors. Please write the whole sentence instead of using aliases

#2	FayreMembershipCard721	Unused variable in function	205	Replace the function with the following if you don't want to use the variable
				
				function tokenURI(uint256) public view override returns (string memory) {
				return _tokenURI;
				}
				
				Remove the tokenId variable and leave the type of it as an parameter

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information https://docs.soliditylang.org/en/v0.5.10/natspec-format.html) for your contracts to provide rich documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

22. February 2022:

- Wrong Routeraddress were used for Pancake / Uniswap Router
- There is still an owner (Owner still has not renounced ownership)
- Developer can lock the contract once for 10 minutes
    - Following conditions should be true for locking
        - antiBotTime should be higher than block timestamp
        - Amount should be higher than antiBotAmount
        - Sender should be marked as bot in bots mapping as true with setBots function
- Developer can
    - set maxTxAmount to zero to lock transfer function
    - set buy back upper limit
    - Enable/disable buy back
        - When it's disabled you are not allowed to swap ETH for tokens
    - Enable/disable swap and liquify
        - When it's disabled you are not allowed to swap tokens or use buy back functions
- Read whole report for more information

SWC Attacks

ID	Title	Relationships	Status
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	**PASSED**
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	**PASSED**
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	**PASSED**
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	**PASSED**
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	**PASSED**
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	**PASSED**
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	**PASSED**
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	**PASSED**
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	**PASSED**
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	**PASSED**
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	**PASSED**

SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	**PASSED**
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	**PASSED**
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	**PASSED**
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	**PASSED**
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	**PASSED**
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	**PASSED**

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