8 CIRCUIT STUDIOS

PRODUCT : PLATFORM : PROTOCOL

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Abstract. The video game industry generates $91 billion dollars a year. Major change is occurring in *how* games are developed and consumed as development tools and access to content reduce the importance that legacy intermediaries traditionally play. Currently players, content creators, and the content created in this industry are all bound to centralized and established systems based on hierarchical and centralized publishing models. 8 Circuit studios is developing the platform and protocols needed to disintermediate the institutions who no longer provide fair value in exchange for the profits they extract from consumers and the producers who create content. Additionally, 8 Circuit Studios will provide a completely revolutionary way for gamers to interact with video games. 8 Circuit Studios uses a proprietary development methodology to rapidly iterate on product (D-PARC as the first game in development), platform (8 Circuit Studios Ecosystem), and protocol (Smart Game Objects). 8Bit Tokens have been created to provide these initiatives with revenue, but these tokens will primarily function as a utility token (with programmable features in their own right). The development and sale of 8Bit Tokens will occur on the Ethereum blockchain based on an ERC20 contract.

INTRODUCTION

Blockchains have demonstrated the incredible power of systems that are voluntary, decentralized, and trustworthy. We believe there is an unexploited opportunity to harness these forces to revolutionize:

• How players claim ownership of their own digital property
• How developers collaborate and profit from the content they produce
• How gamers and developers connect and create

8 Circuit Studios will create content and an ecosystem that unlocks these new possibilities and symbiotic relationships.

PRODUCT

There are two types of product that will be developed by 8 Circuit Studios for use and purchase:
- GAMES: Stand alone or networked games that players can purchase or acquire via digital distribution
- ASSETS
  - **Development assets**. These are elements that can be used by other developers to help them enhance their game. These will be things like object models, animation rigs, audio, code, plugins, etc. - anything that will be experienced by the player when they play a game
  - **Smart Game Object assets**. These are elements that use blockchain contracts to have permanence and enforce ownership (see "PROTOCOL" section below).

LAUNCH TITLE: D-PARC

The first game produced by 8 Circuit Studios is called D-PARC - developed on the [Unreal 4 Engine](#). It is the launch title that will be used to demonstrate 8 Circuit Studios proprietary rapid development methodology and operate as showcase the company's use of Smart Game Objects. It will also make use of ERC20 contract tokens to incorporate initial use cases for token based economies.

D-PARC falls within the management genre and combines strategy, tactics, and moral choices as the player uncovers the future's past.

8BIT TOKEN UTILIZATION

In order to play D-PARC, players will need to create and acquire an in-game character. This character is a Sentient Emergency Entity Model 3 (SEEM3). 8BT are required to instantiate SEEM3 units with Artificial Intelligence through a web interface. Once a SEEM3 is created it will be a unique AI instance based on the characteristics imbued in the creation process. This unique instance will be the character used to navigate the D-PARC and will also be created as a Smart Game Object. Each SEEM3 will have a blockchain address, making it accessible anywhere a wallet holder has access to the Ethereum blockchain. The private key to access each unique SEEM3 AI will be stored in a cryptocurrency wallet. If the possessor wishes to gift, trade or sell it to someone else, it's fully within their ability to do so.

Early purchasers of 8Bit tokens will also be issued a WAVE 1 Insignia, making each SEEM3 a collectors item and one of the very first Smart Game Objects (See below for explanation of Smart Game Objects) in existence . Additionally, when a player creates their login to the 8 Circuit Studio Community, that WAVE 1 Insignia will also be assigned to their profile. **Everyone will know that they were one of the first to believe in this new world of gaming**.

The perks that can be purchased at the Alpha Release of D-PARC in late August are listed below.

Perk	Description
Insider Access to 8 Circuit Studios Development Team	A Slack Channel for communicating directly with the team building D-PARC
Instantiate SEEM3 AI	Through our web portal players will answer a series of questions and choose specific settings to create your unique, limited edition, AI for use in the game D-PARC
WAVE 1 Insignia	Both the AI and Player Profile will be marked with the distinguished WAVE 1 Insignia identifying you and your AI both as one of the first to D-PARC
Access to Early Releases of D-PARC	Access to game builds before general public
"Thank You" in game credits	An official thank you from the development team directly to you in the game credits
One of the Heirloom Humans Aboard the D-PARC	There are 100,000 Heirloom Humans aboard the N-Sataoshi D-PARC vessel. You will be one of these humans with your name appearing in game. Populate the galaxy with your genetic code!
Name a Planetary System in D-PARC	Establish your legacy. Name a planetary system in D-PARC
Executive Producer Credit	As a foundational supporter, you get executive status and top billing in D-PARC's credits

PROTOCOL

GAME OBJECTS

Objects in video games are a collection of information bundled together so that when anyone plays the game they will recognize the object. The information about the object tells the player everything they need to know; the name of the object, what it looks like, if it's something to

interact with, how it can be manipulated, can it be stored in inventory, if it has value, etc. With this information the player now knows about the properties of the object in the game world and what the object might mean to them.

From the developer's perspective they need to define all this information about any object in the game. Depending on how crucial an object is to game play there are various attributes assigned to it. At a minimum each object contains the art assets, size information, level of detail, orientation, etc. It's when an object becomes an item to interact with, like a weapon, armor, or equipment, things become even more complicated from the developer or content creators perspective.

Game-worlds are highly complex, and much like the real world, everything can be described, or defined, as an object.

SMART GAME OBJECTS & OWNERSHIP

At a minimum dozens of hours go into rendering a single object. In the game world a character can sell, trade, attack with, and craft objects, among other things. All this happens within the game itself, but that does not translate to actual ownership of the objects.

In many games there are items, which are essentially identical, from a player's perspective. Especially, when it comes to the avatar that represents the player in these games. But players are not allowed to access or manage those objects outside the game world, limiting the definition of ownership.

8 Circuit Studios Smart Game Objects will change the method of creation and management of objects and allow for ownership of those objects outside of the gaming world. The first Smart Game Object in the game D-PARC (Sentient Emergency Entity Model 3 or SEEM3) will allow for the ownership and creation of the player's character outside of the game itself.

Ethereum extends the abilities of the blockchain beyond a ledger for tracking transactions by adding the ability to run contracts on the blockchain. Each node allows for the execution of these contracts and they can store and return values. With this ability, transactions with contracts can now store information returned from the contract as part of the blockchain. Being able to execute these contracts on the blockchain means that it's possible to create objects with stored values as the attributes of the object. Additionally, as an object on the blockchain, it is provided a unique identifier.

Putting all this together, it is now possible to store any game object, like, a character, a planet, or any other game objects, with attributes, on the blockchain. This means that every node on the network agrees that this object exists and is also in agreement with the information stored about the attributes of those objects. Trusting the network means you can trust the information about the objects stored on the network.

WALLETS AND SMART GAME OBJECTS

D-PARC checks a player's selected Ethereum wallet to verify which objects the player has access to. When the player exits the game, they still have access to the Smart Game Objects in their wallet. Meaning that the player actually has ownership of the Smart Game Objects. It is no longer restricted to the game world. Because the player/wallet owner has access to the object's key they can now sell it, trade it, loan it to someone else, create a contract to manage that loan, etc.

THE FUTURE

With the development of a healthy ecosystem and development community every ability a character earns, every item acquired, every weapon could become a part of a holder's collection. To extrapolate further, this will change the nature of games and game development. It will allow the people who work in the game industry to focus on specific aspects of design, or game mechanics, or models, or stats. It will change the development model and what it means to contribute to a video game.

8 Circuit Studios will be launching Smart Game Objects and shepherding the discussions around creating standardizations, platforms and models for them.

PLATFORM & ECOSYSTEM

Creating Smart Game Objects, and the games designed to take advantage of their benefits, will occur under the second phase of development. 8 Circuit Studios will embark on developing the platform that will facilitate a symbiotic ecosystem of the gaming community, the developers, and the assets and products they collaborate on creating.

COMMUNITY

The community is anyone who wishes to purchase games and assets for playing, exchanging, or gifting content. It also contains those who are interested participating in feedback and supporting their favorite game developers in producing compelling content.

CREATORS, DEVELOPERS, AND CONTRIBUTORS

Creators, Developers and Contributors are the engineers, artists, designers and all the other functional disciplines that are used in the process of developing a game. With the benefit of deep development experience in video games, 8 Circuit Studios is uniquely positioned to provide a system and method for managing assets, tools, and interactions between people wishing to collaborate together.

There are several core functions that the ecosystem platform will provide:
1. Marketplace: Development Assets
    a. Search functionality
    b. Buy/Sell
    c. Feedback & Reputation System
2. Collaboration Circles
    a. Search profiles and benefit from matching with other individuals interested in developing or contributing to development
3. Payment models
    a. Configurable compensation agreements between Circle members

CONTENT

The two types of content that will be provided for purchase will either be developer centric or consumer centric. **Developer assets** will be those items that can be used to develop a game. **Community consumer** assets will be those assets that most gamers are typically familiar with: like stand alone video games (similar to how other digital distribution platform present product). One new offering available to community consumers are the Smart Game Objects developed, traded, offered specifically for users of games that are Smart Game Object enabled.

Developer accounts, or profiles, will have access to the entire catalog of product offerings. Community Consumer accounts will be limited to accessing games or smart game objects. The MVP feature set will be:

1. Marketplace: Development Assets
    b. Search functionality
    c. Buy/Sell
    d. Feedback & Reputation System

8BIT TOKEN (8BT)

8BT's are designated as a use token that will function as units of account in games developed by 8 Circuit Studios and through any partnerships utilizing our platform. The 8 Circuit Studios 8Bit (8BT) token is based based on the Open Zeppelin standards utilizing ERC20 and the Standard Token for Crowdsale.

Contract Functions

The contract for 8BT contains the following functions. Each function will identify the necessary parameters needed in order to be executed.

START SALE

Used to start a sale of tokens.

> Required Information
>
> **Cap** - Number of tokens to be sold, not to exceed the number of tokens available in the wallet must be greater than zero
>
> **Rate** - The number of tokens awarded per Ether
>
> **Start Block** - The block when the sale will start. Value must be less than current block
>
> **End Block** - The block when the sale will end

END SALE

Ends the current sale, only the owner of the contract can end a sale.

PAUSE SALE

Allows the contract owner to pause the sale. No transactions can take place when the sale is paused.

UNPAUSE

Only allowed if the sale is in a pause state. If the End Block of the sale has passed the sale will be in an end state after the pause.

APPROVE

Allows the contract owner to give permission to another address to manage a given number of tokens from the wallet.

> Required Information
>
> **Spender Address** - The address of the party to manage tokens
>
> **Value** - The number of tokens to be managed

TRANSFER FROM

Authorizes the owner to transfer a specific number of tokens from an owned address to a receiving address.

> Required Information
>
> **From Address** - Wallet address containing tokens (must have authorized access to wallet)
>
> **To Address -** Address receiving the tokens
>
> **Value** - Number of tokens to be transferred

TRANSFER

Transfers a specific number of tokens to a specific address.

> Required Information
>
> **To Address** - Recipient address of the tokens
>
> **Value** - The number of tokens to be transferred

BUY

Ability to send Ethereum to a specific address.

> Required Information
> **To Address** - Recipient of Ethereum
> **Send Ether** - Amount of ethereum to send

TRANSFER OWNERSHIP

Transfer ownership of the contract to a new address.

> Required Information
> **To Address** - Address of the new owner.

8BT Contract

```
8BT CONTRACT 0x20F4eb38c210490839cDD7Bc60636171ABb7Bf94

Start Target: 2017-07-18T00:17:00.000Z Block: 4037000
End Target: 2017-08-19T01:18:00.000Z Block: 4182500
```

The code for the 8BT token contract can be reviewed in full at
https://github.com/8CircuitStudios/8BitToken.

Following is the code for the 8BT token issued by 8 Circuit Studio:

```
import 'zeppelin-solidity/contracts/lifecycle/Pausable.sol';
import 'zeppelin-solidity/contracts/math/SafeMath.sol';
import 'zeppelin-solidity/contracts/token/StandardToken.sol';


contract EightBitToken is StandardToken, Pausable {
 using SafeMath for uint256;


  string public constant name = '8 Circuit Studios Token';
  string public constant symbol = '8BT';
  uint256 public constant decimals = 18;


  uint256 public cap;
  uint256 public rate;
  uint256 public startBlock;
  uint256 public endBlock;
  uint256 public sold;
```

```solidity
event Sale(address indexed from, address indexed to, uint256 value, uint256 price);


function EightBitToken() {
  totalSupply = 100 * (10**6) * 10**decimals;
  balances[owner] = totalSupply;
}


function () payable {
  buy(msg.sender);
}


function startSale(uint256 _cap, uint256 _rate, uint256 _startBlock, uint256 _endBlock)
onlyOwner {
  require(cap == 0);
  require(_cap > 0);
  require(balances[owner] >= _cap);
  require(_rate > 0);
  require(block.number <= _startBlock);
  require(_endBlock >= _startBlock);


  cap = _cap;
  rate = _rate;
  startBlock = _startBlock;
  endBlock = _endBlock;
}


function buy(address _to) whenNotPaused payable {
  require(block.number >= startBlock && block.number <= endBlock);
  require(msg.value > 0);
  require(_to != 0x0);


  uint256 tokens = msg.value.mul(rate);
```

```solidity
    sold = sold.add(tokens);
    assert(sold <= cap);


    balances[owner] = balances[owner].sub(tokens);
    balances[_to] = balances[_to].add(tokens);


    assert(owner.send(msg.value));


    Sale(owner, _to, tokens, msg.value);
  }


  function endSale() onlyOwner {
    cap = 0;
    rate = 0;
    startBlock = 0;
    endBlock = 0;
    sold = 0;
  }


  // ERC20 overrides
  function transfer(address _to, uint256 _value) whenNotPaused {
    super.transfer(_to, _value);
  }


  function transferFrom(address _from, address _to, uint256 _value) whenNotPaused {
    super.transferFrom(_from, _to, _value);
  }
}
```

CONCLUSION

Blockchains have provided a tremendous opportunity to introduce digital scarcity and uniqueness without the overhead of a central authority. This new advancement in computer science now enables power and profit to be spread more equitably as a previously fundamental feature of central authority is removed by these distributed systems.

8 Circuit Studios believes using video games to remove the complicated technical barriers and esoteric jargon around blockchains will be the first step to helping individuals intuitively apprehend the power of digital sovereignty.

Additionally, content creators and technical developers will find a platform on which to contribute work and collaborate with others that results in a close-to-frictionless return on their efforts. This is where the trends are flowing towards as video game development tools (hardware, and software like: Unreal Engine or Unity) become cheaper and individuals can more easily work remotely.

And finally, 8 Circuit Studios will produce a protocol (for Smart Game Objects initially) that will be open source and community focused. The combination of these three elements (product, platforms, protocols) will work symbiotically to produce a virtuous cycle of disruptive force in the video game industry.