SwipeCrypto Token (SWC)

A Blockchain Protocol for Mobile Lockscreen Advertising

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Abstract

Current mobile advertising models are ineffective. Mobile websites and most mobile applications typically display advertisements on the side or as banner ads, where users' true attention cannot be captured. In the era of duopoly by way of Google and Facebook controlling almost 60% of the global digital advertising, advertisers are hoping for the emergence of legitimate third players to help keep prices in check, [1] and by delivering more effective brand exposure. Ad Fraud is another major issue in the mobile & digital advertising space. Malicious click-bots and fake traffic have cost advertisers $6.5 billion globally in 2017, according to a report [2] from Association of National Advertisers (ANA) and White Ops (a cyber security firm which exposed the "Methbot" operation).

This paper presents a solution by introducing a decentralized mobile lockscreen advertising protocol leveraging blockchain & ERC20 token technology. The proposed solution is built on top of an existing mobile lockscreen advertising platform developed by SwipeRich[3] which has been in production deployment in multiple countries with proven higher engagement. The SwipeCrypto Token (SWC) will be introduced to reward lock screen users for viewing advertisements, and as a payment token to publishers, while allowing transparency with advertisers through a blockchain ledger system that provides an audit trail to counter ad fraud.

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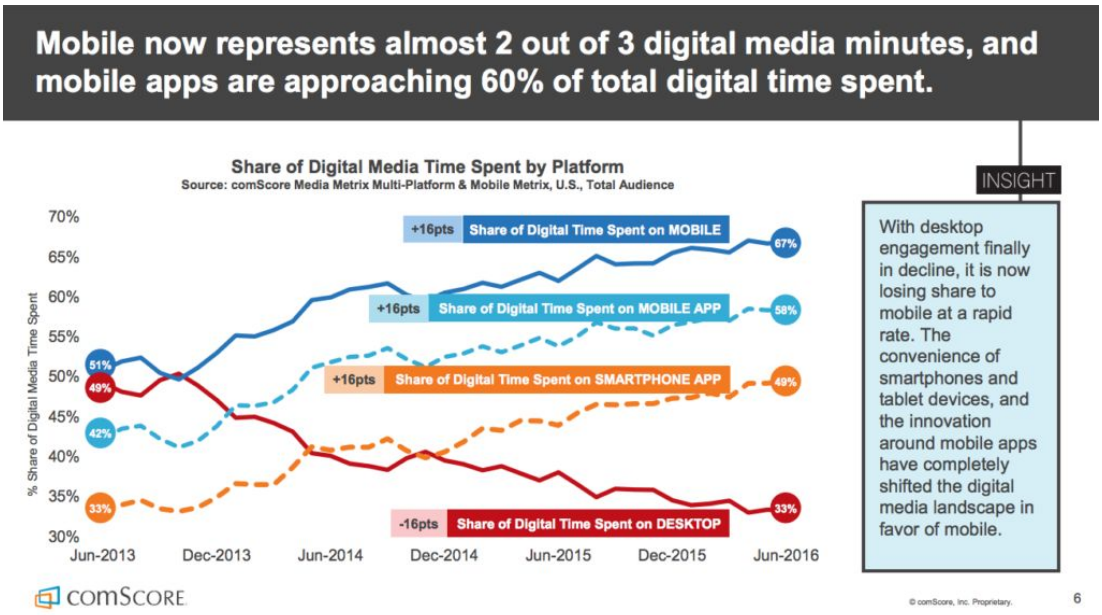
1. INTRODUCTION

1.1. THE STATE OF MOBILE ADVERTISING

The world of advertising has undergone a seismic shift over the recent years. Widespread internet access and exponential growth in smartphone use has seen spending on digital advertising increasing. While digital continues to disrupt the advertising world, mobile digital advertising spend is expected to overtake desktop in 2017, reaching 56% global digital advertising spend according to Dentsu Aegis Network's forecast [5]. By 2018, mobile advertising spend will continue its growth to account for a total of USD 116.1 billion. With the continuous shift of consumer behavior towards mobile where mobile channels now represents almost 2 out of 3 digital media minutes [6], mobile advertising spend will continue to see double-digit CAGR (compound annual growth rate) growth for the coming years.



Share of Digital Media Time Spent [*ComScore*]

Mobile App Model is Ruling, Lockscreen the most Valuable & Effective Channel

For mobile marketers and advertisers, the big swing is the shift towards apps. Various market research and literature review have proven that banner ads or side-loading ads are ineffective advertising formats, further impacted by small form-factor of mobile smartphones [7]. Mobile app usage accounts to about 86% of the total time spent by users on mobile devices, relative to mobile web. Mobile experience has also improved with the smooth transitioning from one app to another, thanks to technology the likes of deeplink and maturing UI/UX design.

The industry is in search of a more effective form-factor and engagement channel where this paper presents mobile lockscreen as the most effective advertising medium in smartphone, proven with a higher click-through rate (higher CTR of 5x or more) and engagement metrics

through data collected in existing production deployment in 2 countries. When strategically implemented, full-screen lockscreen content delivers better user experience by seamlessly integrating to smartphone interfaces, and are less intrusive than banner ads.

Mobile lockscreen advertising also tremendously reduces the issue of accidental clicks due to 'fat-fingers'. Research estimates that 47 percent of small banner clicks are accidental, reducing the effectiveness of mobile ads, thus contributing towards advertising budget wastage. This also impacts mobile attribution in campaign effectiveness measurement.

Transparency in Jeopardy - Need for Alternatives

With the Facebook & Google duopoly controlling close to 60% of the global digital advertising budget, it does not take an economist to know that the risk of price rises are real with less competition. Advertisers are hoping for the rise of a legitimate third player to provide competition that can give them more leverage and help keep transparency and prices in check [1]. While the current 3rd player in the digital advertising pace cannot even crack 3% of the global digital advertising space, it is believed that a true contender may need to compete on different ground, where a new innovative media such as mobile lockscreen advertising can play a part.

> *"... "P&G doesn't want to waste time and money on a crappy media supply chain", Mr Pritchard said. In August, Mr Pritchard moved P&G away from ads on Facebook that target specific consumers, concluding that the practice has limited effectiveness…"*

Advertisers are now suffering the consequences of this duopoly and the current complex advertising network, filled with middleman and exchanges. Advertisers are starting to ask simple questions that could rattle the digital advertising industry to its very fundamentals. Simple questions can be left unanswered 'Where are my ads appearing?'; 'Who's seeing those ads?'; 'Are they in view?' Advertisers are now demanding quality metrics and factors that have been completely ignored in today's duopoly ecosystem, where the digital advertising landscape has been all about cheap low cost audiences at scale without considering the context [9].

This paper proposes more effective alternative mobile advertising based on mobile lock screen with higher engagement, and contextualized content with the transparency of mobile attribution through a blockchain ledger.

Ad Fraud is Real

Advertisers continue to grapple with fundamental issues in their digital campaigns: whether their ads can actually be seen and whether the ads are even reaching real people. The Association of National Advertisers (ANA) and bot detection outfit White Ops, in their annual joint study on the state of digital ad fraud projected that $6.5 billion in financial losses due to ad fraud. The most alarming statistics is a persistent trend where every 3rd visitor of a website is an attack bot, and 94.2% of websites experiencing at least 1 bot attack over period of 90 days [10].

The most common type of ad fraud involves automated software, or "bots", that simulate the activity of a person browsing using a mobile app or browsing web pages. Armies of bots ("botnets") are deployed to generate an estimated 56% of advertising traffic globally. Some of these bots are malwares that run quietly in the background of the infected computer without making its presence known to the owner, others are "bot-farms" which are simply racks of servers running automation software to run a sequence of actions on the advertisements.

More work can be done to reduce the wastage in advertising spend due to ad fraud. Each user can be assigned a unique digital signature to track who is viewing the ads and further engage with the ads, without compromising user privacy. Advertisers should be given the right to audit all advertising engagement records, giving the assurance that all user views & engagements are genuine and accurate. This will rebuild the trust between advertisers and publishers that is diminishing in the digital advertising space.

Publishers face difficulty to monetize their traffic due to ad fraud

Publishers suffers economic losses due to rampant ad fraud in the industry. Ad injection is a common fraud practice whereby hidden insertion of ads occur when a third party intercepts the web content before it is being rendered to the user. The fraud-operator injects ads without publisher's' consent and gets paid for these unsanctioned impressions at the expense of the publisher.

Publishers lose money, and worse, lose data integrity and credibility of their brand in the process. Ad fraud operators spoofed premium publisher domains (hijacking the brand power of prestigious publishers) and then supplied fake traffic (advanced bot behavior complete with browser sessions, mouse movements, geolocation data, and social logins to make it look like real people) to the fabricated inventory. As data is the new capital for digital companies, the publisher's' data becomes unreliable due to the injection of fake traffic. This dilutes a publisher's brand in the industry as advertisers and platforms see a mix of metrics that don't accurately represent a publisher's traffic.

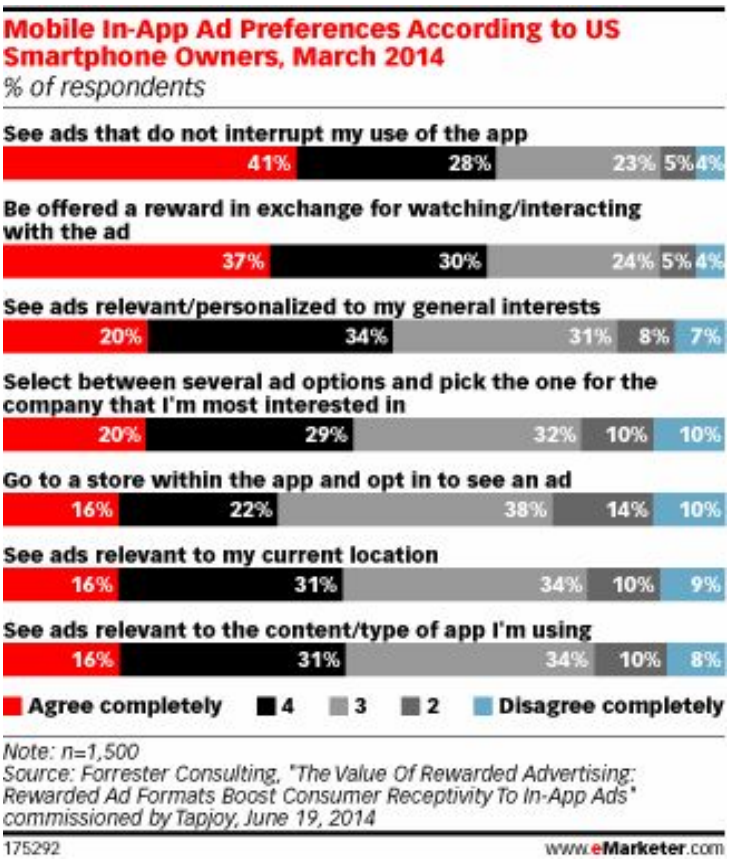
Users are not Rewarded for their Engagement with Advertisements

Fundamentally digital advertising evolves around 2 key success metrics - viewability and engagement that eventually lead to conversion. The Media Rating Council (MRC) proposes that an ad is considered viewable when 50% of it is in view for one second or longer. This arguably serves as an improved metrics over cost-per-mile (CPM) that simply measures impressions delivery.

The engagement rate metric defines the level of users' interaction with the advertisement. Engagement can include a number of different interactions, indicating not only that consumers saw the ad, but that they have conducted certain actions — such as click (CPC), install (CPI), video views (CPCV), actions such as open app/register (CPA). The underlying concept is that engagement with ads create a lasting impression of the brand. Besides the interaction with an ad, engagement includes an ad's ability to capture a consumer's attention effectively (action), and drive towards conversion.

While viewability and engagement are essentially the result of the user's action in engaging with content, today's advertising world continues to ignore and shortchange users without rewarding them for engaging with ads. According to research carried out by Forrester Consulting, more than two-thirds of US smartphone owners surveyed said that if they had to see in-app advertising, being offered a reward for viewing or engaging with an ad was their top preference. [11]

The same research also considered ads with rewards to be far more relevant, especially when the rewards are tied to relevant real-world vouchers or in-app digital rewards personalized to user's interest, specific user-engaged ads, location or app content. For example, 77% of smartphone users who had watched an ad in exchange for a reward received something that could be used in-app, and nearly seven in 10 received currency that was used in the game [11].



67% Users would like to be offered Rewards for interacting with the Ad [11]

The SwipeRich mobile lockscreen advertising platform - the existing product of which SwipeCrypto SDK platform is built on, fundamentally adheres to this design principle. Users engage with lock screen content, where they get rewarded with points when swiping left on lockscreens to engage with advertisements. This paper proposes an improved use case on top of the existing proven working mechanism, where rewards will be given to users using an ERC20 crypto-based token riding on Ethereum. Using the Ethereum blockchain-based token technology as a reward token presents a few advantages such as:- automatic distribution of tokens to users

through smart contracts, transparency and auditability by storing the transaction on the blockchain ledger, and the ability to turn SwipeCrypto into a truly borderless global reward token system, without suffering hefty processing fees charged by payment gateways the likes of Paypal and others.

Rise of Blockchain in Digital Advertising

The future of digital advertising adopting blockchain looks promising. Blockchain will provide the digital advertising industry with the capabilities of smart contracts, global and secure payment systems, token-based communities, transparent record keeping and transparent auditability, with user privacy protected. While the digital advertising industry continues to suffer transparency and ad-fraud issues, blockchain being a trusted protocol represents an opportunity to complement both technologies to tackle the plaguing issues in the industry.

A key development to validate the concept of digital advertising blockchain:- Nasdaq announced that it was going to launch later part of 2017 the New York Interactive Advertising Exchange (NYIAX), which will let inventory be sold using blockchain technology. It uses blockchain in a different way: Smart contracts, which let you facilitate exchanges and when used on the blockchain, will let certain contracts execute automatically, as long as certain conditions are met.

SwipeCrypto adopts a blockchain-based multi-publisher mobile lockscreen advertising platform. Being a leader in the mobile lockscreen advertising platform, it is essential we work with ad exchanges such as NYIAX and other blockchain-based networks to fully leverage the benefits of token and blockchain technology.

1.2. COMPANY BACKGROUND & TEAM STRUCTURE

1.2.1. Company Background

SwipeCrypto is a crypto token product leveraged the expertise of the team from SwipeRich (www.swiperich.com). Swiperich Pte. Ltd. has specialized in bringing advertisers and users together using a Mobile Lockscreen advertising platform, where attention is initiated at the first mobile impression; lockscreen content when an individual unlocks their mobile phone. Headquartered in Singapore, the company has business operations in the Philippines and Indonesia through partnerships with leading local providers in respective countries.

1.2.2. Company History

Timeline	Event
May 2016	SwipeRich Pte. Ltd. founded in Singapore HQ
September 2016	First Production Release
Oct 2016	Commercial Launch in Philippine with #1 Local Mobile OEM - Agila Rewards (www.agila.ph)
May 2017	Commercial Launch in Indonesia with leading local partner advertising - CepatSwipe (www.cepatswipe.com)

1.2.3. **Team**

Clifford Lim
CEO

Industry veteran in business process & management with MNC.

Andrew Marchen
CTO

A seasoned entrepreneur and ICT architect with experience managing multi-millions Singapore government projects.

Kuay Chong Sean
CSO

Strategic product management & business development with experience across MNC & technology startups.

Iyan Waer
COO

Season technologist with strong engineering operation management in global consulting setup.

In Partnership With:

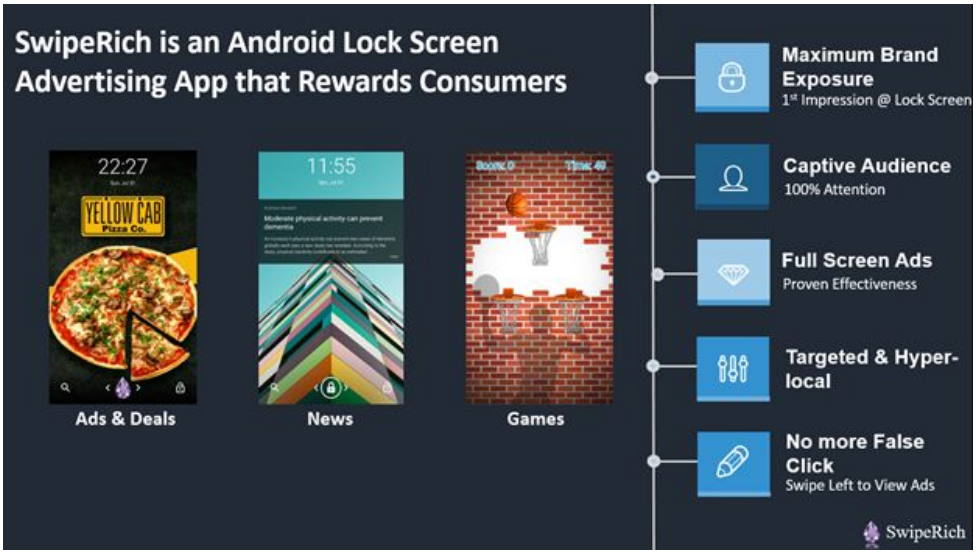
Kovan Testnet Spectrum

1.3. SWIPECRYPTO - BUILDING ON-TOP OF THE PROVEN SWIPERICH MOBILE LOCKSCREEN ADVERTISING PLATFORM

SwipeCrypto is built on-top of the existing lockscreen advertising platform developed by SwipeRich. It has been deployed in the Philippines (AGILA Rewards - www.agila.ph) and Indonesia (cepatswipe - www.cepatswipe.com). Combining the use of blockchain technology and the development of multi-publisher lockscreen SDK, SwipeCrypto aims to deliver a more effective mobile advertising platform with transparency and accountability supported by blockchain technology.

Smartphones have unique features, lock screens being one of them. CNBC conducted ~~a~~ research together with the independent research firm Ampere Analysis, indicating people typically check their phones ~30-50 times a day [16]. This presents an advertising impressions opportunity on lockscreen where a user's attention is maximum, hence making lockscreen the most premium and effective advertising spot on your smartphone.

SwipeRich delivers full-screen content on lockscreen, where a user's attention can be captured with maximum brand exposure. SwipeRich brings the first advertising impression through user's mobile lock screen, ensuring maximum and direct brand exposure. It has been proven in various advertising research that full screen ads deliver the best effectiveness. The solution also adopts security measures to counter accidental clicks, http-injection attacks, bot traffic blacklisting and other security measures.

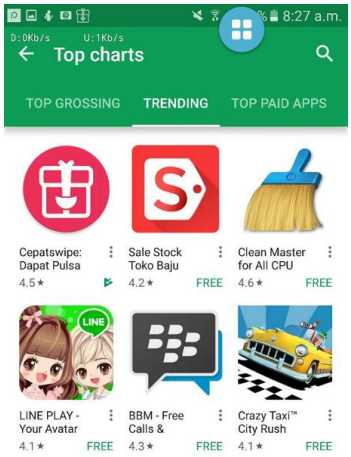


Our solution at SwipeRich consists of a mobile application running on Android, with an intelligent ads-serving engine. Through the combination of these technology platforms, SwipeRich is able to deliver targeted and personalized contents. Frequency capping is implemented to avoid ads-burnout.

Furthermore our solution incorporates various advertising attribution analytics techniques to track and control advertisements impressions, hence delivering relevant contents according to users demographics & interests. Standard reports can be generated for advertisers.

Currently SwipeRich adopts a hyper-local model for each of its deployment in different region, namely CepatSwipe (www.cepatswipe.com in Indonesia) and Agila Rewards (www.agila.ph in Philipines). For operations in each country, SwipeRich has established strategic partnerships with leading operators or agencies within the respective region to minimize business risk, increasing commercial viability.

‘Agila Rewards’ launched through Partnership with #1 Mobile OEM in Philippines



CepatSwipe Launched through Partnership with Leading Outdoor Advertising in Indonesia

2. VALUE PROPOSITION

2.1. BLOCKCHAIN ADDRESSING ‘TRUST’ IN MOBILE ADVERTISING

Fundamental Attributes of Blockchain relevant to Advertising

Blockchain technology is a decentralized database that is widely distributed across networks of computers called nodes. The key attribute of blockchain is that there is no central authority or intermediary to administer these networks; anybody can be a node to perform specific functions such as validating transactions. Data or transaction information is stored on the decentralized database or public ledger. Being distributed & cryptographic in function,

blockchain transactions on the blockchain network are immutable and it is openly available for all to audit the data. The transaction information is coded together to form blocks on the network which are continuously added sequentially to form a chain, hence the term "Blockchain". These attributes are critical in addressing trust and ad fraud issues prevalent in the digital industry currently.

Blockchain and Digital Advertising

Our team intend to disrupt the digital advertising industry by applying blockchain technology to digital advertising. In the current industry practice, advertisers' budgets are distributed to multi layer intermediaries before ever reaching the publisher. In most cases, publishers are not aware of what advertisements are being displayed on their sites and advertisers are not provided with the key metrics the audience of their advertisements. Blockchain capabilities such as smart contracts & multi-signature cryptographic keys can be used for automated micro-payments/transactions between advertisers, publishers and users (globally) based on specific programmed conditions; a key attribute to the facilitation of payments globally. For example, global advertisers HQ can upload their advertising contents for different markets with a certain amount of funds locked in a smart contract for each location. Whenever a user engages the advertisement content, the smart contract will automatically and instantaneously payout fees to the publisher and users without going through any intermediary or approval process. At the same time, the industry saves on all banking related charges; executing telegraphic transfers and currency exchange charges.

2.2. INTRODUCING SWIPECRYPTO & SWC TOKEN

This paper presents a solution to address the current problems in mobile advertising through a decentralized blockchain-based mobile lockscreen advertising platform – named SwipeCrpyto. The solution is conceptualized based on key fundamental building blocks as follows:-

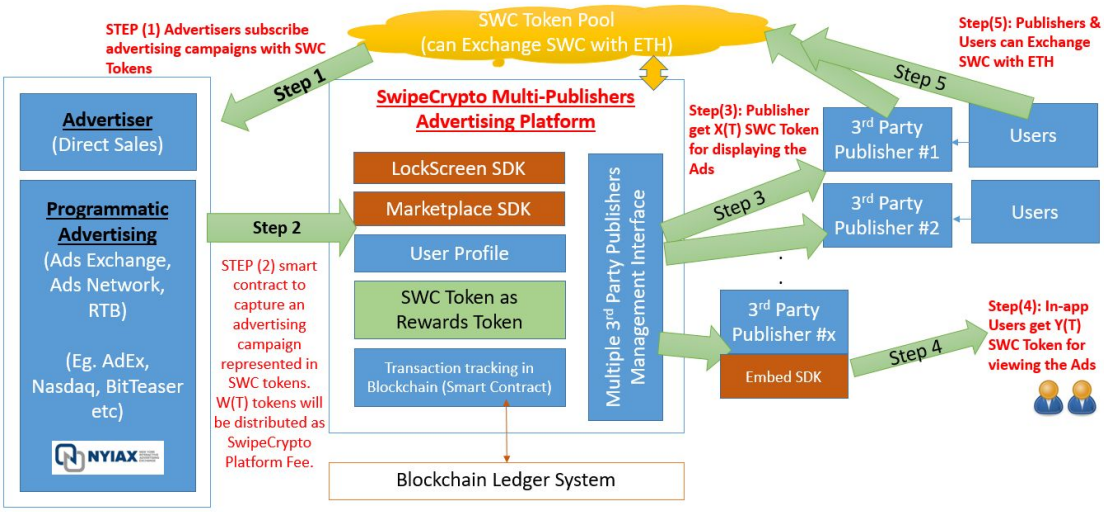
(a) A multi-publishers mobile lockscreen advertising platform based on proven technology developed by SwipeRich technology (www.swiperich.com) with production deployment to multiple regions. Publishers (3rd party mobile applications developers) can now embed the SwipeRich lockscreen advertising solution to their app through the SDK (software development kit). By embedding the SDK, publishers will be able to monetize more effectively and increase activation of their respective applications by delivering in-app contents through the lockscreen.

(b) Ethereum-based blockchain technology leveraging smart contracts, decentralized blockchain ledger for transaction logging, and an ERC20-based token called SwipeCrypto Token (SWC) as a payment token to publishers and lockscreen mobile app users. The SWC tokens have the following attributes:

- **Utility Token Model** - All advertising transactions in SwipeCrypto Platform will be executed via SWC tokens. (Advertisers, Publishers, App User)
- **Deflationary Token Model** - 5% worth of SWC tokens will be burned for each advertising campaign

- Expired SWC tokens held by users will be burned or rechanneled back for SwipeCrypto community building.

SwipeCrypto Multi-Publishers Platform through SDK and SwipeCrypto Token (SWC)



Every advertising campaign will be represented as a smart contract with respective SWC token values, stored on the blockchain for transparency. A specific cut of the advertising revenue will be charged as SwipeCrypto platform fees - W(T). Advertising revenue share to publishers X(T), along with rewards sharing to users Y(T) of the mobile lockscreen advertising solution will be all distributed transparently according to the smart contract in the form of SWC tokens. Z(T) token will be burnt from each advertising contract to enable a deflationary toke model. SWC token holders can exchange the SWC tokens to ETH or other cryptocurrencies through public exchanges.

In order to avoid rewards tokens being held by inactive users causing liquidity shortage, users' rewards SWC token will expire in 365 days from date of transfer to users' in-app virtual wallet. Expired reward tokens will be redistributed as follows:

- 80% of the expired reward tokens will be burnt at the end of every month.
- Remaining 20% of the expired reward tokens will be rechanneled back into community building & referral

Essentially an advertising contracts values will be represented as:-

$$\textit{Advertising Campaign Value in SWC} = W(T) + X(T) + Y(T) + Z(T)$$

The SwipeCrypto SDK platform will also provide a marketplace SDK where 3rd-party publishers can embed the SDK to enable the marketplace in their app. Through this marketplace, users can now purchase digital goods and premium contents through the marketplace. This will

further establish the SWC token as the micro-payment and utilities token within the in-app ecosystems.

SWC tokens are not securities nor equities/shares of any company, and don't promise any potential future values. SWC tokens are not refundable, and shouldn't be perceived as an investment tool.

2.3. WHY SWIPECRYPTO TOKEN (SWC) ?

Leveraging blockchain technology, the proposed solution aims to bring the key attributes of blockchain technology to address the trust issues in the current mobile advertising space. This paper studies the problem statements and SwipeCrypto's responses to these issues.

2.3.1. Decreasing Attention & Ineffective Mobile Advertisements Placement

Research by Microsoft found that since the year 2000 (~ when the mobile revolution began) the average attention span has dropped from 12 seconds to 8 seconds [17]. The attention span issue is worsened by the fact that today's mobile-centric and multi-screen world has resulted in us being easily distracted by multiple streams of media. Research and literature review have also proven that mobile banner ads or side-loading ads are ineffective as an advertising format, further impacted by small form-factor of mobile smartphones [7].

Users were flooded with excessive banners and advertisements on every page visited, human attention reached exhaustion and as a result started to ignore all banners in front of their eyes (i.e banner blindness). Banner blindness is not new to advertisers or the academic community. The first study on the topic was published in 1998 and the term "banner blindness" continues its fame in the digital marketing community as customers became more educated, and the average CTR (click-through rate) continues to decrease.

[Solution] Lockscreen Advertising Delivers Maximum Brand Exposure for Advertisers

The smartphone has unique features, lock screen being one of them. CNBC conducted research together with independent research firm Ampere Analysis indicating people typically check their phones about 30-50 times a day [16]. This presents an advertising impressions opportunity on lockscreen, where users attention is at maximum, making lockscreen the most premium and effective advertising spot on your smartphone. Based on real-life user data collected by the SwipeRich platform through its deployment in AGILA Rewards & CepatSwipe, the lockscreen advertising CTR is roughly 5x - 10x higher than the typical industry CTR, supported by data collected by other similar initiatives. By using multi-publisher through SDK, SwipeCrypto solution delivers lockscreen advertising opportunities to mobile app publishers through SDK.

2.3.2. Publishers Face Monetization Challenges & Payment Method Limitations

Publishers would like to have a more effective monetization strategy for traffic, however at the same time without sacrificing their in-app user experience. Traditional advertising ad-units such as banner ads, side-loading ads, pre-roll ads, and interstitial ads in between screens all

deliver lower engagement CTR (click-through-rate), while impacting in-app user experience due to interruption of application workflow.

Typical advertising networks and exchanges will require publishers to obtain banking account verification, or other banking facilities such as credit card and etc. This is particularly inconvenient in emerging countries, the un-banked communities and smaller publishers.

[Solution] Lockscreen a more effective monetization approach for Publishers, and SwipeCrypto Token (SWC) as the Trusted Micro-payment

Publishers can now seamlessly embed the SwipeCrypto lockscreen SDK into their app through a few lines of code. The lockscreen ad-unit will not interfere with the existing user path/workflow inside the app, hence preserving the user experience of the existing publisher app. Meanwhile, lockscreens will be a more effective monetization approach as it offers higher Click-through-rate (CTR). Publishers can also put in their in-app content onto lockscreens, hence increasing the publisher app activation.

Blockchain will enable advertising campaigns to be tokenized and advertising contracts to be represented as smart contracts. Advertisements distribution transactions will be recorded on the blockchain, and the value of an advertising campaign will be represented on the blockchain by the SwipeCrypto token (SWC). As the advertising contract is executed and advertisements continue to disseminate across publishers, publishers will be paid in SWC accordingly based on the smart contract.

The blockchain token approach will allow for transparency and auditability in the process of monetizing publisher advertising inventories. By using a decentralized blockchain ledger system, public accountability will be achievable. A lot of micro-publishers in emerging countries may not have access to credit cards or banking verification, and the SwipeCrypto solution can have a higher chance to target these areas through the use of cryptocurrencies.

2.3.3. Users are not Rewarded for Engaging with Advertisement

As discussed earlier in this paper, viewability and engagement are essentially the result of users' action in engaging with content, however users' are not compensated for engaging with ads.

[Solution] SwipeCrypto Token (SWC) as Loyalty Rewards to Users

This paper proposes a section of advertising spend to be distributed to the mobile lockscreen app users for engaging with advertisements. According to research carried out by Forrester Consulting, more than two-thirds of US smartphone owners surveyed said that if they had to see in-app advertising, being offered a reward for viewing or engaging with an ad was their top preference. [11]

The SWC token will be used as micro-payments to users through the execution of the smart ledgers. The blockchain ledger will keep track of all transactions as an audit against any

payment claims or dispute. The mobile lockscreen app users can also exchange the SWC token with ETH through public exchanges which will be subsequently identified.

The SWC token will also enable app users to have access to the SWC-supported marketplace for subscription and membership to premium content or digital merchandize. Publishers within the SwipeCrypto community can offer premium users content at the marketplace, where users can make a purchase with SWC tokens.

For future roadmap exploration, this paper may consider leveraging blockchain technology to offer solutions to digital rights management for content creators, where content can be time-stamped and stored with a unique identification that becomes immutable when it is on-chain. This provides the opportunity to create a direct consumer-to-creator network where consumers are able to interact directly with content creators and have direct access to content without going through any intermediaries. Rights to particular pieces of content can be viewed by every participant on the blockchain network instead of storing it on a central server by an intermediary.

2.3.4. Ad Fraud & Traffic Quality

There is no question that the current online advertising ecosystem is flawed. Fraudulent behaviour can be committed by intermediary networks or publishers by a) not providing the much-desired transparency, b) by bot traffic, and c) malicious third party publishers. The digital advertising industry is in need of a solution to ensure ad viewability transparency, accountable ads engagement measurement and tracking, and compliance to advertising campaign guidelines.

[Solution] Blockchain is Well-Positioned to Tackle Ad Fraud

Blockchain can disrupt the digital advertising industry as the underlying technology works on a trust protocol. Through an individual user's unique identity and digital signature, it could accurately record the user's ad engagement behaviour in a decentralized blockchain ledger. The industry can then gain the trust of advertisers by ensuring that quality traffic is delivered and metrics accurately reflect the target audience's behaviour, instead of worrying about fake/fraudulent traffic. Advertisers will only be charged by the exact proportion of the number of users engaging on their ads.

As blockchain is able to support immutability of data, once you have agreed on a transaction and recorded it, it can never be changed. You can subsequently record another transaction about that advertising transaction to change its state, but you can never hide the original transaction. Through this ability to deliver provenance of assets, advertisers can carry out an audit on where an advertisement is placed, and what has happened throughout its life.

The current digital advertising auditing process on the effectiveness of ad campaign delivery is both costly and reactive to fraud. Blockchain technology provides an audit trail into the supply chain using a shared ledger, boosting transparency throughout the delivery process. This ensures that the advertisements are delivered to the targeted audience at the right time in the right place through the right medium with the right content. The data is securely shared and distributed across the entire supply chain to all stakeholders. Blockchain data provides a single source of veracity that all participants can access together to eliminate fraud, instead of relying on

multi layer intermediary reports that creates ambiguity while protecting the privacy of users and publishers.

2.3.5. Privacy Concerns & Data Misuse

Every click and view on a website spawns fresh data left as trails out there for someone to use. The same scenario on when we send chat messages, an email, purchase products online, or any other activity undergone on the internet proliferates your data trail. Companies harvest this data and sell it to whoever has an interest in it. Giants like Google and Facebook have been collecting vast amounts of profit by utilizing our data, where it is difficult for the common user to understand how to protect their privacy online.

Our private data stored online might be vulnerable to cyberattacks. Oftentimes, injected tracking software utilized by marketers have security holes which can be exploited by hackers. Huge customer databases are very attractive for hackers and other syndicates.

[Solution] Anonymity is Inherent in Blockchain

As the transaction data is stored on a decentralized blockchain ledger, data privacy and deterministic user anonymity can be fulfilled by design. The idea is to produce verifiable audits on user transactions to measure the effectiveness of advertising campaigns, where a special digital ledger is created to automatically record every interaction with users and transaction data, in a cryptographically verifiable manner, without compromising users' privacy.

2.4. BENEFITS

2.4.1. Users are rewarded, and get the most relevant information at the first sight with maximum privacy

Everytime the user sees their mobile screen, they will see the most relevant information right away. Our advanced match making logic will analyze user behaviour and preference to decide which data to be presented.

Despite the advanced logic afore mentioned above, user privacy will still be intact since data is not tracked by the Ads Network. User data is encrypted, scattered, and distributed across the blockchain network and almost impossible to be read by anyone.

2.4.2. Advertisers Reach Real Customers

Impression data will only be counted when content is served to real customers. Our sophisticated system will able to detect if a request is coming from a robot or any other fraud request. Targeting will be very real and the user will be more likely to see the content. Advertisers will have a clear vision on what they are paying for, and how effective their marketing through SWC mobile lock screen advertising is.

2.4.3. Publishers increase activation , increase advertising revenue

By implementing SwipeCrypto SDK, 3rd party applications can become a lockscreen mobile advertising publisher immediately without being required to learn sophisticated mobile advertising jargon, and without vast engineering investment. With the SwipeCrypto system, every publisher can monetize their app fast and easily, and at the same time the publisher will get more revenue since there is no middle man between the publisher, advertiser and user, unlike the existing mobile advertising ecosystem.

3. TECHNOLOGY - THE PROPOSED SOLUTION

3.1. OVERVIEW

The SwipeCrypto Token (SWC) is an extension of an Ethereum ERC-20 token. Ethereum is an open source blockchain-based distributed computing platform. The Ethereum ecosystem has been adopted by large enterprises such as IBM, Microsoft, JP Morgan, Deloitte, Royal Bank of Scotland, Santander Bank, Luxembourg Stock Exchange, and Toyota.

Smart contracts are distributed applications stored in the Ethereum blockchain that verify and enforce online agreements in a cryptographically secure manner. Smart contracts are also standard features of the Ethereum ecosystem.

SwipeCrypto utilizes smart contracts to provide transparent ad and rewards distribution from advertisers to publishers and mobile users.

3.2. TECHNICAL DETAILS

3.2.1. Key Stakeholders within the SwipeCrypto Ecosystem

(a) Advertiser

Advertiser, can be a direct advertiser or from a programmatic network – is purchasing ad-slots from the SwipeCrypto platform with or without the specific publisher and/or user specific targeting requirements. The buying model can be based on a number of impressions, clicks, completed video views, app installs, conversions, and many more.

(b) Publisher

Publisher has its own mobile application that is listed in the Google playstore or other eligible Android Appstore(s). Few advantages offered by SwipeCrypto to publishers:

- Additional advertising revenue. There will be revenue share from the advertiser to the publisher and app user based on the number of advertisement engagements generated from the publisher mobile app.

- An increase in the active and daily usage of the publishers own app by using the lockscreen as a notification tool, to promote to their users the activities or promotions of their own application. By reminding users about the publisher's own app, the daily active usage of the publishers app

increases, thus increasing the application's key performance indicator on platforms such as the Google Play Store.

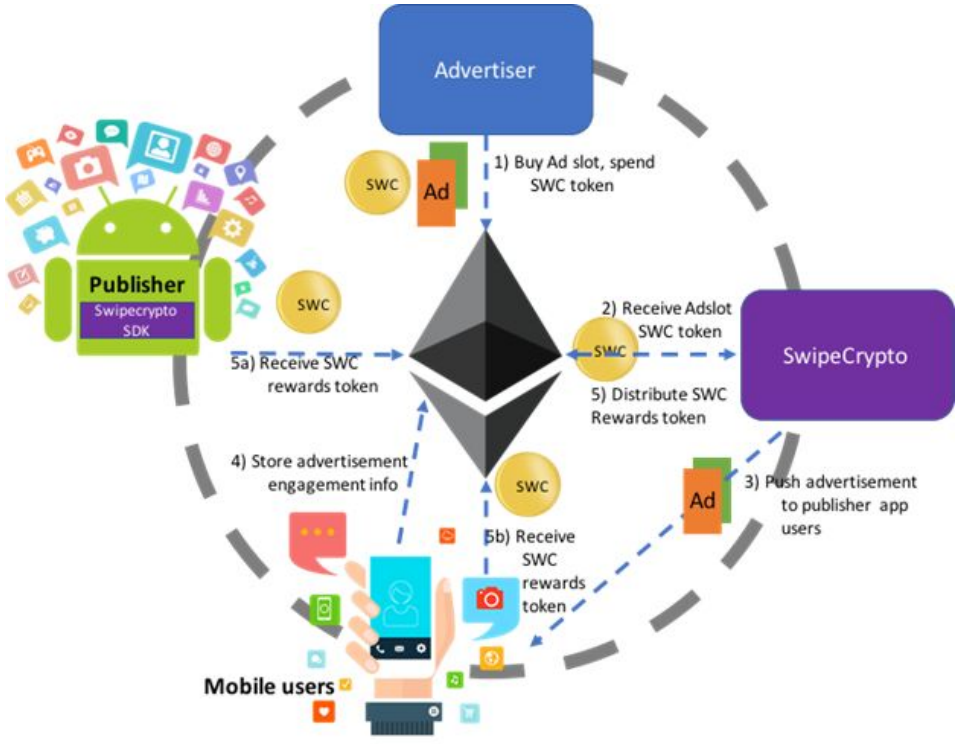
- Complimentary of existing mobile advertising platform. Unlike most of the current mobile advertising platforms which display advertisements when user launches the app, SwipeCrypto allows the user to consume the advertisement without the need of user to launch the app.

- Ease of integration and small footprint. Integration of SwipeCrypto SDK involves signing up of publisher account on the SwipeCrypto website, adding a few lines of code within the application to include the swipecrytpo SDK library (which will be made available in j-center repository) in the build script, as well as starting the lockscreen service during the app launch. SwipeCrypto SDK will be optimized to have a small footprint that will be able to run smoothly even for the low-end android phones available today, without affecting the performance of the publisher app.

- Additional revenue from in-app physical or digital goods. SwipeCrypto capability to allow listing of publisher digital or physical goods provides an additional revenue channel for publishers.

(c) Mobile user

Mobile users with publisher app(s) installed in his or her mobile phone. SwipeCrypto lockscreen will only be activated if the user runs the publisher app at least once in order to start the SwipeCrypto mobile service. The mobile user will be rewarded for engagement with SwipeCrypto advertisements.



SwipeCrypto value creation process

3.2.2. Main Architecture Building Blocks within SwipeCrypto Ecosystem

SwipeCrypto solution main building blocks are:

1. **X-Swipe Ad-Engine**: X-Swipe advertising engine uses AI to match advertisement content with the right publisher's audience through advanced targeting by analyzing factors such as user demographic, user app profiling, time and location, digital behavior (other apps usage, social media/web browsing preference, bot traffic, brute force, IP blacklist, etc), interests, user connectivity/network, and many more. Each ad engagement will also be verified against bot traffic, blacklisted IP and then cryptographically signed.
2. **SwipeDK**: SwipeCrypto android library/SDK (software development kit) that enables publisher app to display advertisement on the lockscreen. SwipeDK will carry out the following functions:
    a. It will serve advertising to mobile lockscreen with publisher app. Publisher app can supply anonymous user demographic info to the SDK to allow serving of more relevant content.
    b. SwipeDK will collect advertisement engagement data such as impressions, clicks, video view, app installs, etc. This data will then be streamed to SwipeCrypto ad-engine on a real time basis.
    c. SwipeDK will provide in-app SWC virtual wallet to store user rewards from mobile user advertisement engagement. SWC token collected on SwipeDK virtual wallet can be transferred to public online cryptocurrency wallets, which can be further converted to other currencies such as Ether (ETH), Bitcoin (BTC), etc.
3. **Marketplace SDK**: SwipeCrypto android library/SDK (software development kit) that enables publisher to list/sell their digital/physical goods within the app without needing to incorporate mobile commerce capability. Marketplace SDK also allows exchange of user reward~~s~~ tokens earnt from publisher's app into publisher in-app currency/point, which can be exchanged with digital/physical goods listed within the publisher app.
4. **Blockchain-based distributed ledger**, stores following information:
    a. Smart contract for ad-slots purchased by advertisers.
    b. Lockscreen engagement transactions such as impressions, click streams, installs, user demographic, digital profile, etc.
    c. Rewards distribution between publishers and users.
    d. Conversion of user rewards into publisher's in-app currency/point.
    e. This data is stored in the distributed ledger to promote security and transparency of data provided by the SwipeCrypto platform between advertisers, publishers and publisher app users.

4. BUSINESS LANDSCAPE

4.1. COMPETITIVE LANDSCAPE

We have seen the rise of blockchain technology applications to address the inherent issues in the digital and mobile advertising space, notably NASDAQ-lead NYIAX blockchain based ads exchange, Basic Attention Token (BAT), adChain, Adex and a couple more. Most of these initiatives focus on addressing supply & demand issues with regards to the transparency and intermediary-heavy ecosystem in the current digital advertising landscape, with BAT focusing more on addressing advertising issues around browsers. We see these initiatives as very encouraging and as validation of our concept of applying blockchain & token technology as a source of trust in the digital advertising sphere, where furthermore we believe there is room for collaboration with these initiatives.

Specific to our context of applying blockchain technology to mobile lock screen advertising, we haven't seen any competitors, as most of them are still leveraging standard technology stacks leveraging traditional centralized technology, for example Slidejoy, Cashslide, Popslide to name a few. By leveraging blockchain technology in mobile lock screen advertising, we see the following competitive advantages:

SwipeCrypto Blockchain-based Mobile Lock Screen Platform	Current Mobile Advertising
Lockscreen advertising app with proven higher conversion CTR (click-through)	Mobile banners are ineffective, easily subject to false-click.
Multi-publishers SDK	Single standalone-app
Advertisers have transparency on the ads delivery trail through blockchain	Ads delivery to who and where are in questions
SwipeCrypto (SWC) Crypto micro-payment allows global outreach	Solutions are mainly localized
Users privacy protected	Users privacy may be compromised
Data are immutable	Data may subject to tamper through hacking

4.2. FUTURE ROADMAP

4.2.1. Product One: Hyper local lockscreen advertising platform (Pre SWC).

4.2.1.1. Swiperich has existing lockscreen advertisement apps operating in the Philippines and Indonesia. The knowledge and experience gained from this has been valuable in understanding market behaviour when it comes to lockscreen advertisements, furthermore giving us the tools to understand what can be improved in the future.

4.2.1.2. Through Agila Rewards Lockscreen (Philippine market) and Cepatswipe Lockscreen (Indonesian Market), any person who has an Android device can monetize their lockscreen page, while the advertiser has the ability to reach the customer's lockscreen for maximum exposure.

4.2.2. Product Two: Publisher SDK platform with crypto currency rewards (During SWC)

4.2.2.1. With our Future Lockscreen SDK any app developer can be a publisher, and can reach customer lockscreen to get maximum exposure without the need to perform complicated engineering efforts, hence getting maximum benefit with faster times to reach the market. The customer and publisher will get SwipeCrypto Tokens (SWC) as a reward from advertisers.

4.2.2.2. With our future Marketplace SDK/Extension, any publisher or app developer can increase their customer retention rate by promoting their product/service through the SwipeCrypto marketplace ecosystem, while the customer enjoys the product and services by exchanging the SWC Token which they continuously receive as they lock/unlock their device. At the same time, advertisers will get more exposure as the market grows rapidly.

4.2.3. Product Three: Social lockscreen advertising (Beyond SWC)

4.2.3.1. Part of our vision to expand our business model from just a lockscreen advertising platform is to expand to become a 'Social Lockscreen' platform. SwipeCrypto envision that all social communities (e.g. sports team, hobbies, fans club, etc.) will be able to reach out to their followers through content that is available on their followers' mobile lockscreen. These social communities can monetize their followers attention on the lockscreen thus providing funding to allow them to further expand their social communities. Followers of these social communities, using the rewards earned through lockscreen advertising can redeem merchandise from the social community. SwipeCrypto is currently exploring POC with one of the early adopters with more than one million followers to pilot test this initiative.

4.2.3.2. As the ecosystem becomes established, SwipeCrypto will maintain engagement with more stakeholders to grow the ecosystem, enabling more products and services to benefit customers through increased ease and speed. SwipeCrypto will explore further collaboration with other blockchain adtech players to create a sustainable ecosystem.

5. CONCLUSION

The SwipeCrypto blockchain-based mobile lockscreen advertising solution strives to address the current issues in mobile advertising by combining proven higher engagement (higher click-through-rate CTR) lockscreen advertising and blockchain technology as the agent of 'Trust'. With the SwipeCrypto mobile advertising platform, advertisers will have transparency on the viewability and engagement metrics of their advertising spend, and have better visibility into the effectiveness of their marketing campaigns. Publishers of SwipeCrypto lockscreen SDK enjoy new ways to monetize their mobile application through frictionless micropayments with the SwipeCrypto Token (SWC) which is ERC20 based. Micropayments can be executed faster, coded through smart contracts. Users will be rewarded for engaging with advertising content, and SWC tokens earned can be exchanged with ETH or purchases in-app digital premium content, or merchandise through the SwipeCrypto Marketplace SDK.

Addressing trust issues in mobile digital advertising requires a decentralized, transparent and secure way to record, review and execute a deal. Blockchain technology inherently built in these attributes by design. We acknowledge blockchain transformation will not happen overnight, nor will it eliminate intermediary 3rd party ads-buying altogether. Nevertheless, the blockchain revolution represents a paradigm shift in how digital advertising can be conducted more transparently towards a more accountable mobile digital advertising practice.

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