

FundCru

*The blockchain-powered
commercialized
fundraising platform*

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Whitepaper

October 25, 2017, Version 0.2 - Draft

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1 Abstract

Fundraising campaigns and online deal sites offer incentives and experience problems that initially seem disjoint. Fundraising campaigns provide a means for supporters to help a personal cause, but are limited to mainly requesting fiat money donations. Online deal sites assist merchants who have difficulties with customer acquisition but ultimately fail to address the larger issue of customer retention. Although these entities and their respective problems appear unrelated, in reality, both fundraising campaigns and online deal sites share characteristics that, when combined, yield an effective solution to the problems of both sides.

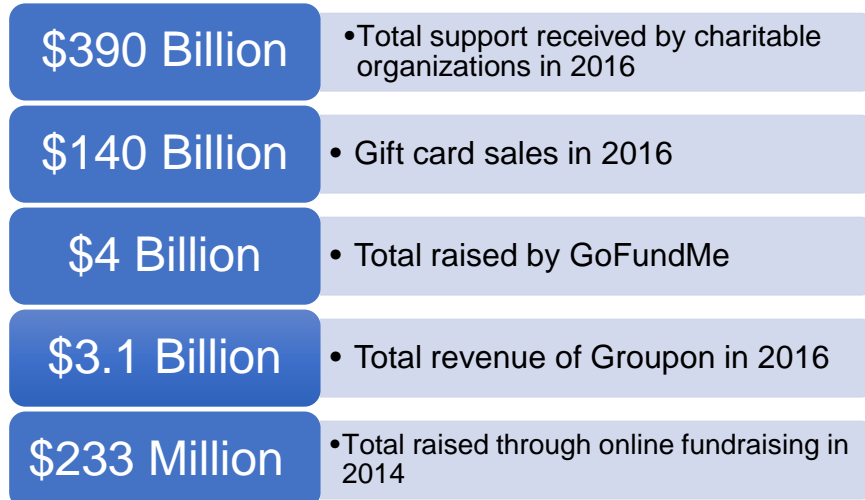
In this paper, we present a novel business and technological solution called FundCru, a blockchain-powered fundraising platform that connects everyday fundraisers, merchants, and supporters in a way that generates value for all sides while eliminating long-standing issues that afflict each party. FundCru's business model differs from those of conventional fundraising platforms by supporting e-commerce, providing fundraisers with a wealth of additional revenue sources, merchants with significantly improved outreach and marketing, and supporters with more ways to help their causes and themselves. FundCru distinguishes itself with its key, technological innovation, as these e-commerce transactions comprise sales of gift cards, coupons, and vouchers, all of which *are implemented and managed entirely as smart contracts* on the Ethereum blockchain, regardless of whether they were purchased using fiat money or cryptocurrency. This means that once these smart contracts have been deployed, customers and businesses can transact just as they normally would, by using QR codes, while having the unique assurance that *all currency storage and transfers are decentralized and occur without any reliance on centralized services or third-party entities*, including FundCru itself. This ensures unprecedented levels of compliance, scalability, and security. To the best of our knowledge, FundCru is the only application, active or proposed, that has successfully developed this technology.

FundCru will maximize returns on its business model and technology by strategically positioning itself, first and foremost, as a blockchain-powered *fundraising platform*. Doing so allows FundCru to serve the priority market, everyday fundraisers, and thereby attract additional supporters and merchants. FundCru is designed to naturally align the incentives of all three groups, creating an ecosystem that greatly improves upon the effectiveness of fundraising campaigns while addressing the issue of customer acquisition and retention for businesses that join our platform.

2 Market Background

In 2016 alone, charitable organizations received over 390 billion USD in financial support. During the same year, gift card sales totaled an estimated 140 billion USD, and online coupon platforms and deal sites generated revenues exceeding 3 billion USD.¹ In their combined lifetimes, online fundraising platforms have raised billions of dollars for local and large-scale fundraising campaigns, with one of the largest platforms, GoFundMe, raising over 4 billion USD and projected to reach between 5-7 billion USD by 2020.² Statistics obtained in 2014 show that in this year alone, online fundraising for non-profits generated over 233 million USD,³ presenting huge growth potential in our digital age. To capitalize on this potential, FundCru combines blockchain technology with an innovative business model.

Market Background



¹ Total gift card revenue: <https://wallethub.com/edu/gift-card-market-size/25590/>

Total given to charities: <https://www.charitynavigator.org/index.cfm/bay/content.view/cpid/42>

In 2016, Groupon alone had \$3.1B Revenue: <http://investor.groupon.com/financials.cfm>

² GoFundMe total raised and projections:

<https://www.gofundme.com/about-us>

<https://www.forbes.com/sites/susanadams/2016/10/19/free-market-philanthropy-gofundme-is-changing-the-way-people-give-to-causes-big-and-small>

³ Online giving statistics: <https://www.charitynavigator.org/index.cfm?bay=content.view&cpid=1360>

3 Problem Overview

3.1 The Challenges and Limitations of Fundraising

Traditional fundraising often takes the form of asking for direct fiat money donations or providing products and services in exchange for donations from supporters. Some organizations also fundraise via partnerships with individuals, corporations, social groups, and other third-party entities that assist in (a) raising public awareness through social campaigns; (b) collecting donations, often at checkouts, transaction completion, or social activities; and (c) donating a portion of their sales or profits. Except for rare cases when a fundraising campaign goes viral and attracts intense public attention, usually these partnerships are effective only when partnering with organizations that have major name recognition, and even then, they are usually reserved for more familiar causes like cancer research or disaster relief.

Given these constraints, many individuals and smaller organizations and campaigns turn to online platforms for fundraising. Many existing campaign-based fundraising platforms such as GoFundMe and Fundly are useful in enabling people to extend their fundraising campaigns beyond their local communities. However, such platforms still incur operational inefficiencies and usually fail to connect fundraisers to a much greater wealth of willing, third-party funding. Major limitations of current fundraising platforms include:

- Limited scalability in forming partnerships between fundraising campaigns and businesses. Although fundraisers who are capable of forming these partnerships find success, this strategy is still extremely difficult to scale due to the overhead cost of seeking out and persuading businesses to team up for fundraising purposes.
- Limited number of causes for customers to support. Partnering with individual fundraisers is also suboptimal for businesses because customers will have only a handful of campaigns to support at any given time. For example, businesses joining an advertised partnership with a fundraiser will usually sell certain products at a higher price in exchange for donating a portion of their sales to the fundraising campaign. Some customers purchasing the product would rather send the proceeds to a different cause. Others may want to support the cause but would rather do so by purchasing a different product. Effective fundraising, therefore, requires a much more extensive set of matched products and fundraising campaigns for customers to choose from.
- Significant platform fees. Many popular fundraising platforms charge a platform fee, usually at around 5-10% of all funds raised.⁴ We believe donations should go directly to the causes and that any fees needed to transfer these donations should be minimal.
- Lack of support for cryptocurrency on existing fundraising platforms

3.2 The Challenges of Customer Acquisition and Retention for Businesses

Our fundraising platform and business model also targets a different problem for businesses, namely, how to effectively acquire and retain customers. One popular strategy that many businesses adopt is discounted pricing, where they offer products and services at a reduced price. With this strategy, businesses sacrifice a percentage of their profits to attract and hopefully retain

⁴ Crowdfunding fees, including processor fees, for various platforms at the time of this whitepaper: GoFundMe, GiveForward.com, Razoo: 7.9%, Indiegogo: 7-12%, Fundly: 7.8%, RocketHub: 8-12%.

new customers, aiming to eventually compensate for their short-term losses by increasing long-run revenues.⁵ Many businesses, especially small and medium ones, nevertheless lack the resources to effectively broadcast their discounts to a larger market and therefore turn to deal sites such as Groupon, LivingSocial, and others. These deal sites create centralized marketplaces where businesses make offers at heavily discounted prices, as doing so is expected to draw in customers and help businesses increase their long-term revenues. However, as shown in the case of the leading deal site, Groupon,⁶ this model may attract new customers but can easily fail to retain them. In other words, when regular prices return, customers typically do not come back and businesses struggle to recoup their losses. FundCru offers a solution to the problems of customer acquisition and retention by building and maintaining between businesses and their customers a connection that is based on shared values and supporting causes.

⁵ Nagle, Thomas T., John Hogan, and Joseph Zale. *The Strategy and Tactics of Pricing: New International Edition*. Routledge, 2016.

⁶ On Groupon's business model:

<https://hbr.org/2013/12/can-groupon-save-its-business-model>

<http://www.businessinsider.com/the-real-data-on-groupons-performance-2011-6>

https://hbr.org/2011/07/the-problem-with-groupons-busi?referral=03758&cm_vc=rr_item_page.top_right

<https://www.forbes.com/sites/greatspeculations/2014/05/21/how-groupon-plans-to-improve-customer-retention/>

4 Mission Statement

“To create a blockchain-powered ecosystem where fundraisers, businesses, and supporters can collaborate for mutual benefits and economic value.”

FundCru believes that fundraising can be done more efficiently and that fundraising partnerships should be able to scale effortlessly. We are committed to providing a unique platform and ecosystem in which partnerships between fundraising campaigns and businesses can flourish and where commercial interests of customers are aligned with and supportive of their values.

5 Business Model

FundCru aims to disrupt the fundraising industry and provide a unique, yet intuitive, solution to many longstanding problems of current fundraising and deal sites. FundCru accomplishes this by transforming key components of existing fundraising and deal sites with an incentivizing strategy that has been made possible by emerging blockchain technology. FundCru's goal is to connect fundraisers to a global network of businesses and supporters, generating funds far more efficiently than other conventional fundraising platforms do.

5.1 Market segments

FundCru focuses on the following market segments. Its future user base includes: (a) fundraisers who range from everyday individuals to large organizations; (b) merchants who are businesses that sell goods and services; and (c) supporters who make contributions to fundraisers and conduct commercial transactions with merchants. FundCru facilitates transactions and collaboration among these three groups in a way that generates tangible revenue and intrinsic benefits for everyone involved.

5.2 Business model overview

FundCru will position itself as a fundraising platform. FundCru is unique in its capacity to support e-commerce transactions from merchants as a key mechanism for providing additional revenue sources for fundraisers. Additionally, FundCru will support standard features, just as other fundraising platforms, including facilitating direct donations from supporters to fundraisers.

A key, differentiating component of FundCru's business model is that FundCru will allocate a significant portion of all merchant sales to *any* supporter-selected fundraising campaign.⁷ These sales comprise gift cards, coupons, and vouchers that will be redeemable online or at a physical location—just as with “real” gift cards, coupons, and vouchers—and can be purchased using credit/debit, ETH,⁸ or other cryptocurrencies. All gift cards, coupons, and vouchers will be stored as smart contracts on the Ethereum blockchain regardless of the payment method.⁹ Funding apportionment will occur at the time of purchase, ensuring that merchants and fundraisers receive their appropriate funds.

These features present two key innovations. The first is technological, as these gift cards, coupons, and vouchers are implemented and managed entirely as *decentralized smart contracts*. This means that once FundCru has issued these contracts, customers and businesses can use them to transact *without any reliance on centralized entities for currency storage or third-parties for currency transfer*, including FundCru itself.

The second results from FundCru's business model. By letting supporters select any campaign for FundCru to send funds to, FundCru distinguishes itself from all existing platforms by, in effect, connecting all participating fundraisers to all merchants operating on our platform, facilitating their collaboration and mutually beneficial transactions, and significantly increasing the number of potential partnerships that are available to fundraisers.

⁷ For specifics on how merchant sales are used to support fundraisers, see Section 5.3.4.

⁸ For specific uses of the FundCru token, FUND, see Section 8.

⁹ For technical and implementation details on gift cards, coupons, and vouchers, see Section 10.

5.3 Business strategy

5.3.1 Positioning FundCru as a fundraising platform

Many online fundraising platforms often do not directly raise awareness of fundraising campaigns on their platform. Instead, these platforms (often referred to as “social fundraising platforms”) encourage fundraisers to promote and publicize their own campaigns by sharing them on social media.¹⁰ FundCru will leverage this component of the social fundraising model, as it is substantially more effective in (a) reducing development costs by simplifying the necessary platform functionalities, (b) minimizing advertising overhead costs, and (c) most importantly, ensuring that site visitors and potential supporters are already connected to an existing fundraising campaign. This final point is especially crucial for priming site visitors, as those entering the site via social media will already have fundraising specifically in mind.

FundCru’s implementation of the social fundraising model is central to its identity as a fundraising platform, ensuring that site visitors and potential supporters unambiguously view FundCru as a fundraising platform despite its e-commerce capabilities.¹¹ Positioning FundCru primarily as a fundraising platform rather than an e-commerce site not only eliminates any potential misunderstandings that may arise from its novelty; it also streamlines other parts of FundCru’s business strategy, including attracting fundraisers and enabling merchants to sell their goods and services without resorting solely to the discounted pricing strategies of other deal sites.

5.3.2 Prioritizing fundraisers

Among the three segments, FundCru places special emphasis on fundraisers as the priority market. Fundraisers are the most important segment because they enable FundCru to onboard the other core platform users, namely merchants and supporters.

FundCru’s solution to make fundraising more effective is to connect fundraisers to a much greater, untapped pool of merchant partnerships. Accordingly, FundCru must first gain traction with fundraisers in order to incentivize early-adopting supporters to use the platform and, as a result, pull merchants onboard. Even after its early stages, FundCru will continue to focus on fundraisers to attract new supporters and merchants alike.¹² This focus on fundraisers aligns with FundCru’s positioning itself as a fundraising platform and is the most effective way to ensure that both merchants and supporters also benefit tangibly from our business model.

5.3.3 Merchants and Cause-Related Marketing

The conventional practice for businesses using deal sites such as Groupon and LivingSocial is to offer sizable discounts on their goods and services as a means to attract new customers. This strategy incurs short-term losses, putting businesses at risk of being unable to recoup their initial losses. This risk, however, results from these sites’ near total reliance on discounted pricing strategies to attract customers as well as their inability to integrate other marketing strategies into their platforms.

¹⁰ Examples of social fundraising platforms: GoFundMe, YouCaring, Generosity, Fundly, GiveForward, Razoo, and RocketHub amongst others

¹¹ For specifics on how FundCru applies the “social fundraising platform” model, see Section 6.

¹² For more on why fundraisers are the target market, see Section 7.1.1.

FundCru adopts a new approach based on the proven practice of cause-related marketing¹³ in which a business partners with an organization or cause to produce both social and business value. Cause-related marketing has been studied extensively, particularly to gauge consumer responses,¹⁴ and has been shown to be effective in improving the image of businesses and producing sales-driving customer responses, especially if the consumer feels that the cause is connected to the business itself.⁹ FundCru's value proposition is that merchants can use our platform not only to attract new customers, but also to associate themselves to an entire platform of fundraising campaigns, which the supporters select *on their own accord*. As a result, supporters themselves create the connection between businesses and fundraisers, meaning that FundCru enables merchants to attract and retain new customers without necessarily having to utilize discounted pricing. Instead, merchants can also leverage the cause-related marketing strategies that are naturally integrated with the FundCru platform to incentivize customers and build a bond with them that is based on shared values.

5.3.4 Application utility fee for merchants

Because fundraisers are crucial to the FundCru ecosystem for providing the incentives that attract merchants and supporters to the fundraising site, FundCru will prioritize their success at all phases of development and donate to fundraisers with a consistent, sizeable portion of all merchant sales. This will typically be 25% of the *total* sale.

During the alpha and beta phases, FundCru will onboard our target user groups while focusing primarily on merchants and fundraisers. To encourage fundraisers and merchants to switch from other platforms and mitigate any risks they may perceive about onboarding an early-stage platform, FundCru will provide very competitive incentives. Similarly, because fundraisers will not yet be able to leverage a massive pool of supporters and merchants, FundCru will aim to ensure their success by reinvesting its own money on advertisements, promotions, and onboarding additional users. During these early stages, merchants will earn a percentage that significantly beats those of leading deal sites,¹⁵ and fundraisers will still typically receive 25% of the *total* sale. FundCru will reinvest its own portion to promote itself as well as highlight specific fundraising campaigns. By allocating the largest portion to the merchants at a superior rate, FundCru gives merchants an additional advantage while alleviating any perceived risks. Furthermore, by allocating the vast majority of the remaining funds to the fundraisers and continuously reinvesting in the platform, FundCru ensures that fundraising campaigns on the platform will receive ample funding while still allowing FundCru to bolster areas in need.

¹³ Referenced sources on cause-related marketing:

Bridges, Sheri, Kevin Lane Keller, and Sanjay Sood. "Communication strategies for brand extensions: Enhancing perceived fit by establishing explanatory links." *Journal of Advertising* 29.4 (2000): 1-11.

Buil, Isabel, Leslie de Chernatony, and Leif E. Hem. "Brand extension strategies: perceived fit, brand type, and culture influences." *European Journal of Marketing* 43.11/12 (2009): 1300-1324.

¹⁴ Referenced sources on consumer responses to cause-related marketing (CRM):

File, Karen Maru, and Russ Alan Prince. "Cause related marketing and corporate philanthropy in the privately held enterprise." *Journal of Business Ethics* 17.14 (1998): 1529-1539.

Melero, Iguácel, and Teresa Montaner. "Cause-related marketing: An experimental study about how the product type and the perceived fit may influence the consumer response." *European Journal of Management and Business Economics* 25.3 (2016): 161-167.

Zdravkovic, Srdan, Peter Magnusson, and Sarah M. Stanley. "Dimensions of fit between a brand and a social cause and their influence on attitudes." *International Journal of Research in Marketing* 27.2 (2010): 151-160.

¹⁵ Percentage charged by leading deal sites, Groupon and LivingSocial: 50% of the sale price

After the alpha and beta phases, FundCru will officially launch, after which FundCru will focus primarily on growth while still upholding the success of its fundraisers. Accordingly, FundCru will continue reinvesting its funds, placing more emphasis on expanding.

6 Platform Usage

FundCru is designed to meet the distinct needs of all its market segments and optimize the returns of fundraisers, merchants, and supporters. This section explains how fundraisers, merchants, and supporters can effectively utilize the FundCru platform.

6.1 Fundraisers

Fundraisers comprise everyday individuals. They can create new fundraising campaigns on the FundCru website, providing basic information about their causes, including, among others, background information, location, duration, and funding target. They can also specify the accepted forms of donations (credit/debit, ETH, FundCru tokens,¹⁶ or any combination of the three). Fundraisers are then encouraged to share and promote their campaigns on social media to raise awareness and visibility.

6.2 Merchants

Merchants may discover FundCru through various means including advertisements, popular demand from FundCru users, or through direct sales outreach. Merchants can then apply online to join FundCru, after which, FundCru will then before activating their accounts. Once approved, merchants can sell gift cards, coupons, and vouchers that may be redeemed online or in person, depending on the specific merchant. Merchants may also select specific fundraising campaigns to feature themselves with; this, however, will only be a recommendation and will not restrict which causes supporters can select.

6.3 Supporters

FundCru enables anyone to support their preferred fundraising campaign through commercial purchases from merchants, by promoting the campaign on social media, or by donating (via traditional payment methods or cryptocurrencies). FundCru supporters will likely arrive on the site through three primary entry points: a shared link promoting a fundraising campaign on social media or website, a shared link from a merchant advertisement, and the main FundCru webpage.

- Supporters who enter the site through a social media link will be given the follow options to contribute: purchase a product or service from a merchant, make a donation to a campaign of their choice, or share information about a campaign on social media.
- Supporters who enter the site through a merchant's advertised link will be given the option to make a purchase and then select the cause that will benefit from their purchases.
- Supporters who enter the site through the FundCru webpage can browse causes or merchants and then proceed accordingly.

¹⁶ For specific uses of the FundCru token, FUND, see Section 8.

7 The FundCru Ecosystem: A New Paradigm

Fundraisers, merchants, and supporters all play indispensable roles in the FundCru ecosystem. This section explains each of these three groups in more detail and elaborates on how they interact and collaborate for mutual benefits.

7.1 The role of each user group in the FundCru ecosystem

7.1.1 Fundraisers

Fundraisers play a critical role within the FundCru ecosystem as they will provide both the initial and sustained incentives for onboarding supporters and merchants. For example, supporters will adopt an early-stage fundraising platform depending on the number of personally relevant causes to support. Similarly, merchants will adopt an early-stage platform if it has a sufficient number of supporters who will become customers and fundraising campaigns worthy of endorsing.

7.1.2 Merchants

FundCru partners with merchants to expand the revenue sources available to fundraisers and provide supporters with another option for financially backing their selected causes. Based on the current plan, FundCru will allocate 25% of sales from merchants to supporter-selected campaigns. These sales of desired goods and services provide direct and concrete benefits for supporters in addition to the intrinsic value of supporting fundraising campaigns. The portion of merchant sales that FundCru allocates to fundraising campaigns further encourages fundraisers to turn to FundCru as their primary venue for future fundraising.

7.1.3 Supporters

Supporters ultimately fuel the FundCru ecosystem by supporting merchants and fundraisers both directly through donations and purchases and indirectly through sharing on social media. Supporters have a key role in promoting fundraising campaigns on social media as a way to attract other potential platform users. FundCru encourages this sharing through its user engagement system,¹⁷ as FundCru will donate tokens directly to campaigns based on the amount of social media engagement generated, increasing opportunities for viral marketing and platform participation. Furthermore, this social media engagement will benefit merchants and fundraisers by advertising deals and raising awareness of ongoing campaigns.

7.2 How each user group benefits

By connecting the three groups and facilitating their mutually beneficial collaboration, FundCru enables fundraisers, merchants, and supporters to serve the common good and generate even more economic value.

7.2.1 Fundraisers: raise money without having to directly ask for money

FundCru's ecosystem expands access of participating fundraisers to funding sources, benefitting them substantially. In addition to donations, participating fundraisers can continue to receive financial backing from commercial transactions, providing a global network of partnerships to all

¹⁷ For specifics on how FundCru rewards fundraising campaigns based on social media engagement, see Section 8.2.

fundraisers. This feature also relieves fundraisers from the burden of performing costly direct outreach.

These partnerships allow fundraisers to raise money in a more expansive and efficient way than on conventional platforms. Most importantly, fundraisers can now avoid one of the hardest parts of fundraising and acquire funding without having to ask for money directly. Instead, they can simply share on social media any merchant deal that they believe their network of supporters would enjoy, and their causes will be listed as an option for users to support. This presents a huge improvement when compared to conventional fundraising practices because instead of having to ask for direct donations and risk irritating supporters, fundraisers can now fundraise just by keeping their supporters' best interests in mind.

7.2.2 Merchants: a solution to customer acquisition and retention

Customer acquisition and retention requires a considerable amount of financial resources, and conventional deal sites lack the capacity to build customer loyalty on behalf of participating businesses. As a result, customers do not feel connected to the merchants and tend to discontinue their transactions after deals expire.

FundCru rectifies this issue by establishing a connection between supporters and merchants that is based not only on commercial interests but also on fundraising campaigns and shared values. Furthermore, while doing so, FundCru receives a comparatively small portion of the merchant sales *that would have already gone to advertising and customer acquisition anyway*. Merchants are also likely to save money when using FundCru, as they do not have to discount their prices as heavily, if at all, due to FundCru's integrated cause-related marketing strategies. By including fundraisers as a benefitted party, FundCru provides a channel where merchants and supporters stay connected, extending their relationship beyond lifeless transactions. And given that both merchants and supporters work together to assist the same cause, supporters are not only more willing to make an initial purchase regardless of whether there is a discount, but also more likely to continue their customer loyalty even after their FundCru sale ends.

7.2.3 Supporters: more freedom and ability to help

Supporters using the FundCru platform enjoy two-fold benefits. Firstly, supporters have complete control over the goods and services they wish to receive, as well as the fundraising campaigns that benefit as a result. This means that supporters are able to decide exactly where their money goes, thereby eliminating much of the discomfort and guilt associated with either supporting a cause that one does not fully believe in or rejecting a cause for personal or financial reasons. Secondly, supporters can take advantage of FundCru's user-engagement mechanism.¹⁸ This enables supporters to help their favorite fundraising campaigns raise tokens simply by sharing and promoting the campaign on social media. As a result, supporters can still help their causes financially without having to spend their own hard-earned money.

7.3 FundCru Ecosystem: A unique platform for commercial and social value

The FundCru ecosystem is designed to achieve more efficient fundraising, better customer retention, and better user engagement. By establishing meaningful connections between merchants, fundraisers, and supporters, FundCru ensures that all three parties come to share a

¹⁸ For specifics on how FundCru rewards fundraising campaigns based on social media engagement, see Section 8.2.

common value. Establishing this value and connection is crucial since doing so provides both direct and indirect incentives: supporters are more willing to return to their preferred merchants and continue to support their causes, merchants are more willing to continuing onboarding and supporting fundraisers, and fundraisers are more likely to turn to FundCru for more cost-effective fundraising. In short, FundCru is the only platform out there where all three parties—fundraisers, supporters, and merchants—can each benefit more than is possible on other platforms as well as experience sustained benefits onwards.

8 Token Mechanism

8.1 Platform Utilities

The token that will be sold during the token launch is the FundCru Token, or FUND. FundCru offers opportunities for merchants and fundraisers to benefit through purchasing and spending FUND.

Certain FundCru utilities incur fees, namely the gas fee required for deploying smart contracts and the platform fee for merchants. These are preferably paid for with FUND, although merchants can also pay with ETH or fiat money. FUND, however, will be promoted as the preferred and most economical method, as utility fees will be discounted by 15% when paid for using FUND.

FundCru, for example, incurs a deployment fee when issuing gift cards, coupons, and vouchers. FundCru will charge the merchant, not supporter, the equivalent amount. The merchant can then pay this fee with FUND, ETH, or fiat money but can save 15% by using FUND. Similarly, merchants can also save 15% by using FUND to pay for hosting their sale on FundCru.

FUND can also be used on the FundCru platform by fundraisers and merchants to access premium utilities. For both fundraisers and merchants, these utilities include advanced real-time analytics, front-page featuring, “Google AdWords”-like promotions, and consumer relationship management (CRM) utilities. Merchants can also use FUND to be featured on relevant campaign pages and have FundCru set up a blockchain-based gift card management system. This gift card management system is especially valuable, as creating and maintaining one through conventional channels is often prohibitively expensive for small and medium-sized businesses.¹⁹ Fundraisers can also use FUND to be featured on relevant merchant and checkout pages and stay engaged with current donors.

8.2 User Engagement System

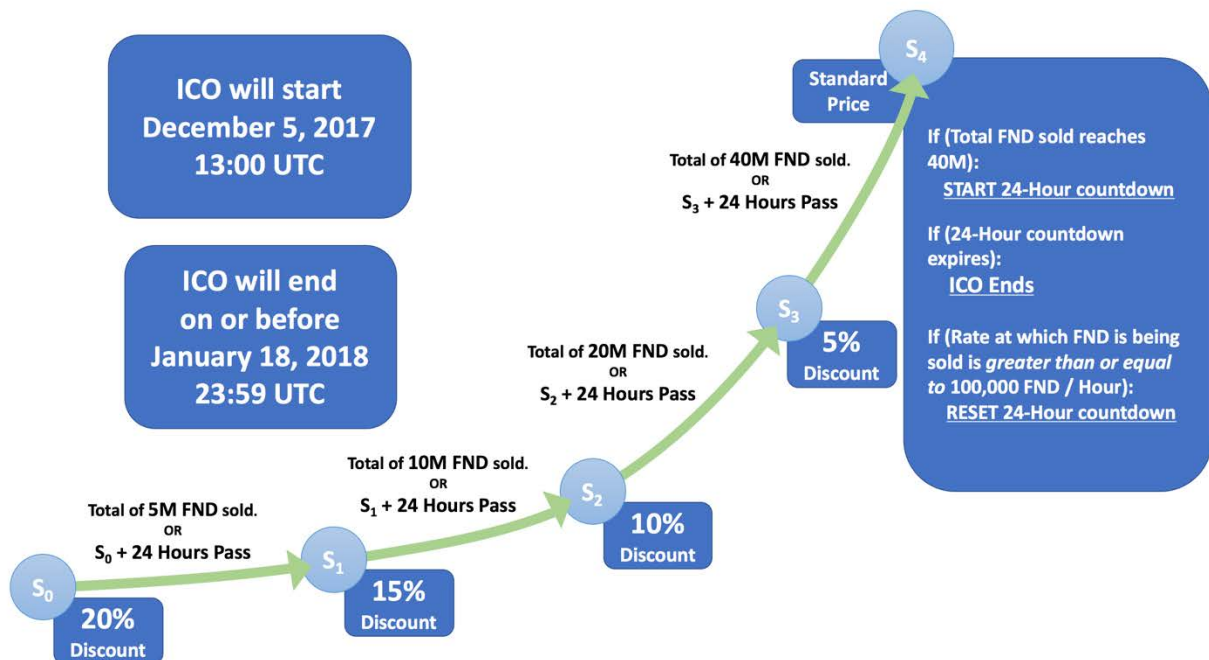
FUND will also be used to reward social media engagement. Fundraisers are encouraged to raise awareness for their causes by sharing information about their fundraising campaigns on social media. Every time their post is re-shared on social media, a formula will account for various factors (including the number of followers, friends, page likes etc. that the sharer has, the number of shares that result, and the number of conversions that result from this share) and calculate the number of FUND that FundCru will then reward the corresponding fundraising campaign. Doing so will not only enable fundraising campaigns and FundCru to increase social visibility via viral marketing, but also allow supporters to help their favorite causes without having to make direct financial contributions.

¹⁹ For technical and implementation details on gift cards, coupons, and vouchers, see Section 10.

9 Token Sale

The FundCru initial coin offering is scheduled to start on December 5, 2017, 13:00 UTC. The token sale will end according to mechanism below. The earliest possible end time will be December 5, 2017 after 13:00 UTC, and the latest possible end time will be January 18, 2018, 23:59 UTC. The price of each FUND will be approximately 1USD in ETH at the start of the initial coin offering. For every token purchased, another will be issued to FundCru so that the FUND supply will be split evenly between FundCru and the purchasers. Our minimum goal is to sell 1M FUND. The FundCru ICO will use the following time-triggered discount schedule:

Schedule of FundCru ICO:



- The FundCru ICO will end, at latest, on January 18, 2018, 23:59 UTC.
- S₀: When the ICO starts, tokens will be sold at a 20% discount. The state will transition to S₁ when ANY of the following conditions is met:
 - A total of 5M FUND is sold
 - S₀ + 24 hours has passed
- S₁: Tokens will be sold at a 15% discount. The state will transition to S₂ when ANY of the following conditions is met:
 - A total of 10M FUND is sold
 - S₁ + 24 hours has passed
- S₂: Tokens will be sold at a 10% discount. The state will transition to S₃ when ANY of the following conditions is met:
 - A total of 20M FUND is sold
 - S₂ + 24 hours has passed
- S₃: Tokens will be sold at a 5% discount. The state will transition to S₄ when ANY of the following conditions is met:

- A total of 40M FUND is sold
 - $S_3 + 24$ hours has passed
- S_4 : Tokens will be sold at standard price (no discount).
 - After the total FUND sold reaches 40M, a 24-hour countdown timer is started.
 - The ICO will end when the timer expires.
 - If the rate at which FUND is being sold is greater than or equal to 100,000 FUND per hour, the countdown timer is reset to 24-hours.

10 Technical Architecture

The FundCru platform is developed using modern real-time web and mobile technologies on top of the Ethereum blockchain to enable fundraisers, merchants, and supporters to interact with FundCru services quickly and seamlessly across multiple devices.

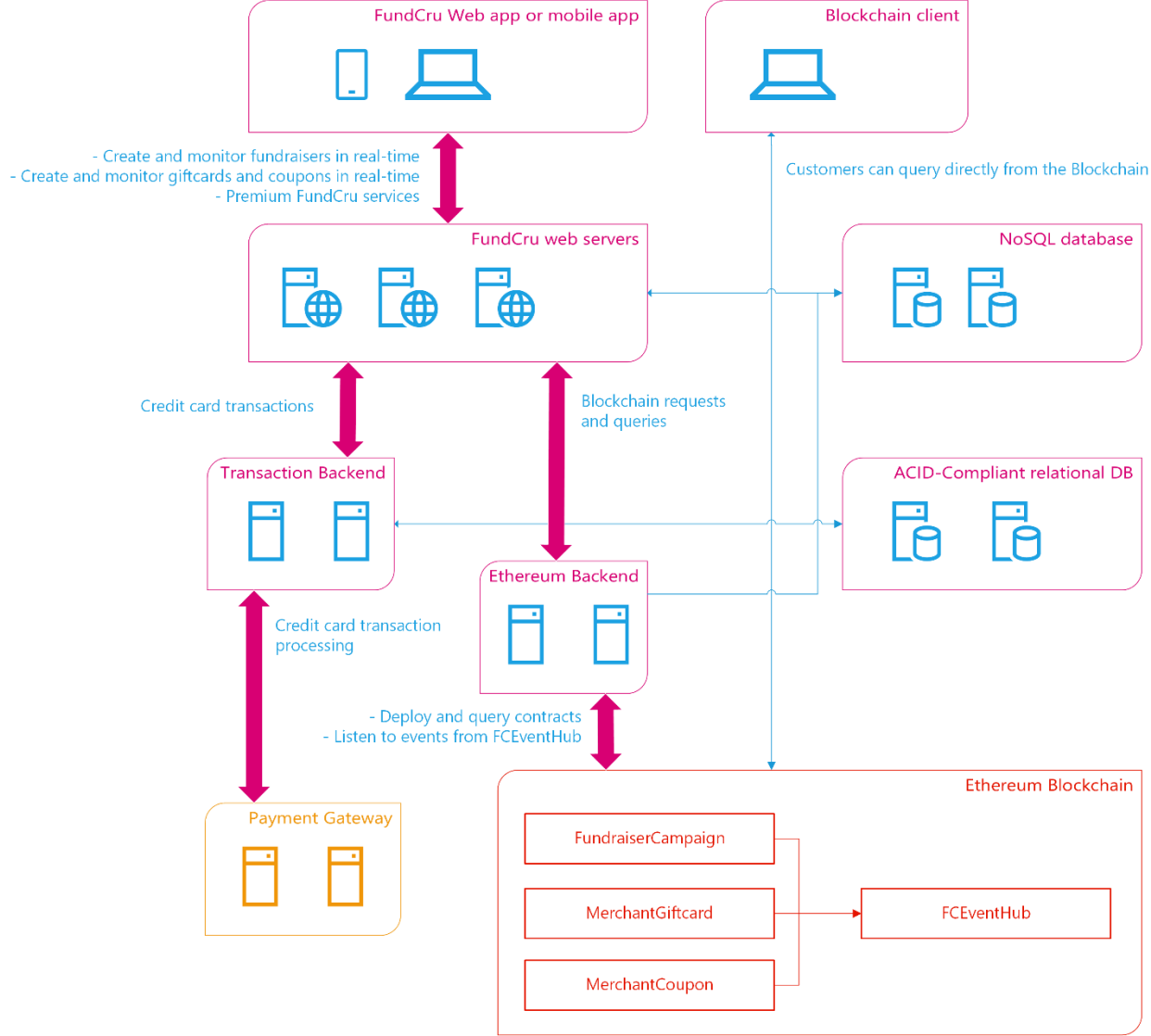


Figure 1. FundCru Architecture

Figure 1 depicts an overview of the current architecture. The goal is to combine the decentralized, smart contract processing blockchain with a full-stack, real-time web system to provide the best of both worlds. Customers can use services provided by FundCru to easily track their preferred fundraisers and any offers that have been deployed on the blockchain. This significantly lowers the barriers to entry for decentralization. More tech-savvy customers can directly use a blockchain client to monitor their fundraisers and/or merchant offers.

FundraiserCampaign, MerchantCoupon, and MerchantGiftcard are Ethereum smart contracts deployed by FundCru and owned by the fundraisers. The implementations and interfaces of these contracts can be found on the [FundCru Github](#). All transactions are facilitated by the blockchain. The contracts emit events so that the owner can receive them via any blockchain event listener. FundCru provides an FCEventHub contract to receive these events for progress tracking on the FundCru website.

The Ethereum Backend layer forwards customer requests to the blockchain for transaction processing. It also listens for events from the FCEventHub in the blockchain and saves the events into the NoSQL database for the web layer to pick up.

In addition to cryptocurrencies, FundCru also supports traditional payment via credit and debit cards. These are handled by the Transaction backend via a payment gateway, and the transactions are stored in an ACID-compliant relational database.

On top of the backend, the web layer uses the NoSQL database to host the contents of fundraisers and deals/offers. As mentioned earlier, the NoSQL database is also used to store updates from the blockchain. The web layer listens to notifications from the NoSQL database and backend and pushes the notifications back to the clients for real-time updates.

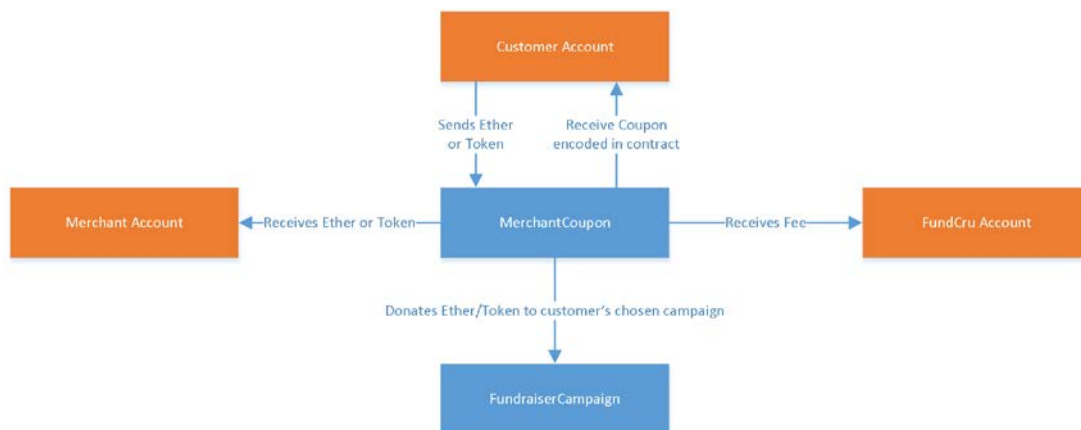


Figure 2. Actors and ether flow in a commerce purchase

Figure 2 shows the Token/Ether flow when a user purchases a MerchantCoupon or a MerchantGiftcard. The customer will receive the coupon as the balance encoded in the contract itself. The Token/Ether sent from the customer will be distributed according to the aforementioned distribution to the merchant account, a fundraiser campaign – as chosen by the customer – as a donation, and FundCru as a fee.

The [ERC-20](#) Token Standard is becoming a blueprint for tokens on Ethereum. Nevertheless, it is not directly applicable to fundraiser campaigns, merchant gift cards, or coupons. In what follows, we describe FundCru’s APIs for these contracts.

10.1 FundraiserCampaign

When a fundraiser publishes a campaign on FundCru, FundCru also deploys the FundraiserCampaign contract on the Ethereum blockchain. This contract is owned by the

fundraiser (based on the [owned pattern](#) or a similar pattern to separate the deployer and the owner of the contract). The fundraiser is able to specify a beneficiary who can be the owner herself or a different person or organization. In addition, the contract exposes attributes, such as `amountRaisedInEther`, `amountRaisedInToken`, and `numDonors`, so that the fundraiser can keep track of the progress on FundCru website or query the blockchain directly. The API of `FundraiserCampaign` is presented in Figure 3.

```
contract FundraiserCampaignInterface is owned {
    // FundCru will set the campaign name at deployed time
    string public name;

    uint256 public fundingGoalInWei;
    mapping (address => uint256) public amountRaisedInWei;
    mapping (address => uint256) public amountRaisedInToken;

    uint64 public numDonors;
    bool public campaignOpen;

    function FundraiserCampaign(address _owner,
                               address _beneficiary,
                               uint256 _fundingGoalInEthers,
                               address _eventHubAddress) public;

    // fallback: inheritance just needs to log an event
    function() payable public;

    // fund by ether
    function fund() payable public;

    // fund by Fundcru token
    function fundByToken(address _address,
                        uint256 _amount) public;

    function closeCampaign() onlyOwner public;
    function openCampaign() onlyOwner public;
}
```

Figure 3. FundraiserCampaign API

10.2 MerchantCoupon

When a merchant wants to issue coupons for a deal or sale campaign, FundCru will deploy a `MerchantCoupon` contract, which is then owned by the merchant. An example of a merchant coupon is CrispyPizzeria's coupons where customers can receive a large, 30\$ pizza for just \$15. The interface and public variable of `MerchantCoupon` are described in Figure 4.

```

contract MerchantCouponInterface is owned {
    // name of the coupon set at deployed time
    // or initialized via constructor
    // e.g. "CrispyPizzeria_15_for_30".
    string public name;

    // total coupons issued for this sale campaign
    // (initialized via constructor)
    uint64 public totalCoupons;

    // total redeemed coupons so far
    uint64 public redeemedCoupons;

    // coupon ownership
    mapping (address => bytes) public couponsOf;

    function MerchantCoupon(address _owner,
        uint64 _totalCoupons) public;

    // query number of remaining coupons
    function remainingCoupons() constant public returns (uint64);

    // query the number of coupons an owner owns
    // MerchantCoupon can also implement a mechanism to limit
    // the number of coupon purchased by a customer
    function couponsOf(address _owner) constant public returns (bytes);

    // mark a coupon as redeem
    function redeem(uint64 couponCode) public returns (bool);

    // transfer a coupon to another owner
    function transfer(address _to, uint64 couponCode) public returns (bool);

    // administrative routines
    function startSale() onlyOwner public;
    function endSale() onlyOwner public;

    // fallback: inheritance just needs to log an event
    function() payable public;

    // purchase the coupon using Fundcru token
    function purchase(address _address) public;
}

```

Figure 4. MerchantCoupon API

During an e-commerce transaction on the FundCru platform, the merchant receives their share, the designated fundraiser receives a donation, and FundCru receives, in some cases, platform fees. In addition to the above interface, MerchantCoupon needs to support multiple beneficiaries. Figure 5 depicts the interface of a contract supporting 3 beneficiaries each with a per-mille (1/1000) share for each transaction.

```

contract MerchantCoupon3Beneficiaries is MerchantCouponInterface {
    address beneficiary1;
    address beneficiary2;
    address beneficiary3;

    // integers represents per-mille (1/1000) share of each
    // beneficiary for each transaction
    uint shareOfBeneficiary1;
    uint shareOfBeneficiary2;
    uint shareOfBeneficiary3;

    function MerchantCoupon3Beneficiaries(
        address _beneficiary1, uint _shareOfBeneficiary1,
        address _beneficiary2, uint _shareOfBeneficiary2,
        address _beneficiary3, uint _shareOfBeneficiary3,
        uint totalCoupons) public;
}

```

Figure 5. Merchant coupon contract with 3 beneficiaries.

Other contracts supporting other sharing models can be derived similarly, e.g. one beneficiary receives a fixed amount (i.e. FundCru receives fix amount for platform fee) and the other two beneficiaries share the remaining percentages.

Depending on the payment instruments, ETH or FundCru tokens, a payable function or a purchase function must be implemented in the contract, as indicated in Figure 6.

```

contract MerchantCouponInterface is owned {
    ...

    function() payable {}

    // purchase the coupon using the Token at _address
    function purchase(address _address);

    ...
}

```

Figure 6. MerchantCoupon handles both Ether payment and Token payment.

The Token contract needs to have an `approve` function ([ERC-20](#) Token Standard) to enable the customer to approve merchant to charge a certain number of tokens from the his or her account.

10.3 MerchantGiftcard

One major difference between `MerchantGiftcard` and `MerchantCoupon` is that each gift card has some value that the customer can redeem partially, just as with standard gift cards. Other than that, `MerchantGiftcard` shares similar characteristics with `MerchantCoupon` such as multi-beneficiaries, purchasability, and the interface for those features. The main feature differences of `MerchantGiftcard` contracts are presented in Figure 7.

```

contract MerchantGiftcardInterface is owned {
    // name of the coupon initialized via constructor
    // e.g. "PlanetEarth Coffeehouse $200 Giftcard".
    string public name;

    // giftcard value, initialized in constructor
    uint64 public value;

    // total number of gift cards issued for this sales
    // initialized via constructor
    uint64 public totalSupply;

    function MerchantGiftcard(address _owner,
    string _name,
    uint64 _value,
    uint64 _totalSupply) public;

    // giftcard ownership
    mapping (address => bytes) public giftcardsOf;

    // query all the giftcards an owner owns
    function giftcardsOf(address _owner) constant public returns (bytes);

    // query the balance of a giftcard using the its number
    function balanceOf(uint64 giftcardNumber) public;

    // charge an amount in giftcard, only contract onwer,
    // i.e. merchant, can perform this
    function charge(uint64 giftcardNumber, uint64 amount) public returns (bool);

    // transfer a giftcard to another owner
    // only giftcard owner can perform this
    function transfer(address _to, uint64 giftcardNumber) public returns (bool);
}

```

Figure 7. MerchantGiftcard API.

10.4 Mechanism to redeem coupons and gift cards

Coupons and gift cards are purchased by Fundcru tokens, these purchases will result in Ethereum transactions where we can extract customer's public key from the signatures of these transactions. Fundcru will save this public key and associate it with the coupons and/or gift cards.

At the same time of purchasing, customer will be asked to claim his coupons/gift cards by performing a digital signature signing, making the coupons/gift cards redeemable by himself only. The signature can be stored in a QR code, which customer can show to the merchant at the time he redeems the coupon.

We'll provide an API for merchant to verify whether a coupon/gift card is valid. The validity of a coupon must meet the following conditions:

- Coupon belongs to the right customer: we will verify the signature using the public key stored earlier.
- Coupon has not been redeemed.
- Coupon has not been expired