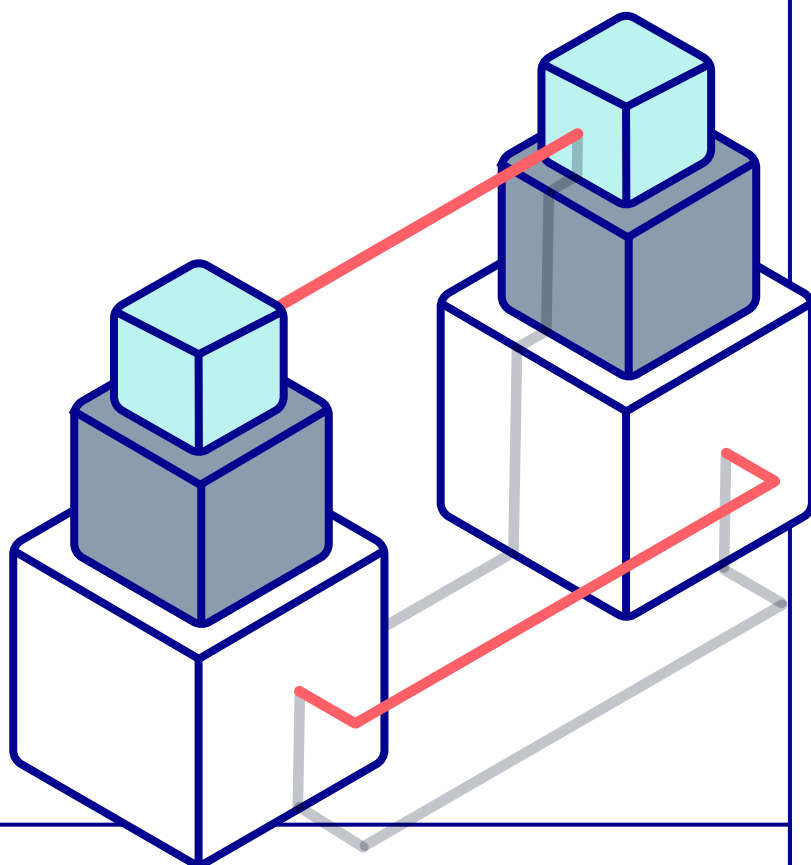




TTC协议：

基于去中心化和代币激励的 社交网络



v0.9

The information set forth below contains up to date materials from TTC Foundation in regards to the TTC Protocol and related matters. In an effort to ensure materials in this white paper are accurate and reflective of the most current state of the TTC Protocol, TTC Foundation may revise this white paper from time to time without any advance notice. The information presented in this White Paper is indicative only and is not legally binding on TTC Foundation, its affiliate(s), and/or any other party. This document is for informational purposes only and does not constitute and is not intended to be an offer to sell, a solicitation of an offer to buy, or a recommendation of (i) TTC tokens, or (ii) and investment in TTC-related platform(s) or any project(s) or property(ies) of TTC Foundation., or (iii) shares or other securities in TTC Foundation or any of its affiliate(s) or associated company(ies) in any jurisdiction. Please read the important legal disclaimer at the end of this White Paper.

摘要

传统移动社交网络服务通过中心化的结构给用户提供服务, 用户通过观看平台广告给平台提供商业价值。

TTC是基于去中心化和代币激励的新一代社交网络协议, 在社交网络中心化趋势愈发明显的今天, 我们希望给用户创造一种个人价值感更强、活动更有趣的全新的社交体验。

通过区块链技术和代币激励的思想, 让广大社交用户在传统的人与内容、人与人的互动中, 获得全新形式的代币奖励, 并随着对其他用户的贡献获取更大的回报, 将社交平台产生的收益返还给价值真正的创造者——用户, 进而产生巨大的网络效应和商业影响力。

在全新的代币机制下, 早期的激励手段和良好的产品氛围有助于快速建立起用户口碑和产品品牌, 形成网络效应后, 用户的成长和平台价值的扩大将变得水到渠成。

tataUFO是基于年轻人社交网络的个性化生活分享平台, 目前有超过10,000,000注册用户。tataUFO将作为TTC开放平台上第一个DAPP, 旨在利用区块链技术和代币激励机制突破现有社交网络的瓶颈, 为广大用户带来更大的社交价值。

目录

01 背景

社交网络对去中心化的诉求	01
区块链技术	03
区块链技术与社交网络	04
社交网络中的代币激励	05

02 TTC代币

TTC代币	06
经济体系	08
• 内容奖励	10
• 声望奖励	12
• 推广奖励	14
• 奖励机制	16
露出机制	18
平台环境	19
应用场景	20

03 TTC生态系统

TTC生态系统	22
tataUFO	24

04 TTC基金会

TTC基金会	26
------------------	----

05 技术考量

在链与脱链平衡	27
技术架构.	28
路线图	29

06 TTC发行计划

价值模型	30
ICO方案	34

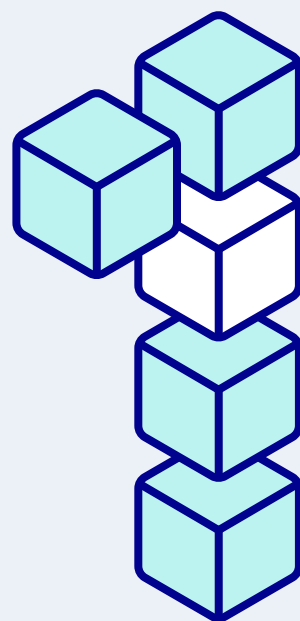
07 团队

核心成员	36
顾问	39

White Paper Disclaimer

O1

背景



社交网络 对去中心化的诉求

随着移动通信的发展,越来越多的用户有机会向世界展示自己的生活动态,第一时间获取好友甚至陌生人的动态,并随时产生互动,建立并维系相互之间的社交关系。各种基于社交网络的移动应用快速地崛起,像 Facebook、Instagram、微博、知乎,都成为了用户发布生活动态、表达态度、建立社交联系的平台。

在社交网络日益成熟完善的今天,用户却越来越感受到了社交平台的限制。由于平台的高度中心化,平台流量被少数头部用户所控制,普通用户参能够获得的关注和收益越来越少,这也导致用户创作产生内容的动力越来越弱。另一方面,由于网络化效应而产生的广告收益被平台所获得,广大的平台参与者的个体价值难以体现。

如今,中心化的社交平台模式限制了社交参与者的热情,也不符合互联网平等开放的精神,社交用户正期待着更加开放公平、更强激励的去中心化社交网络。

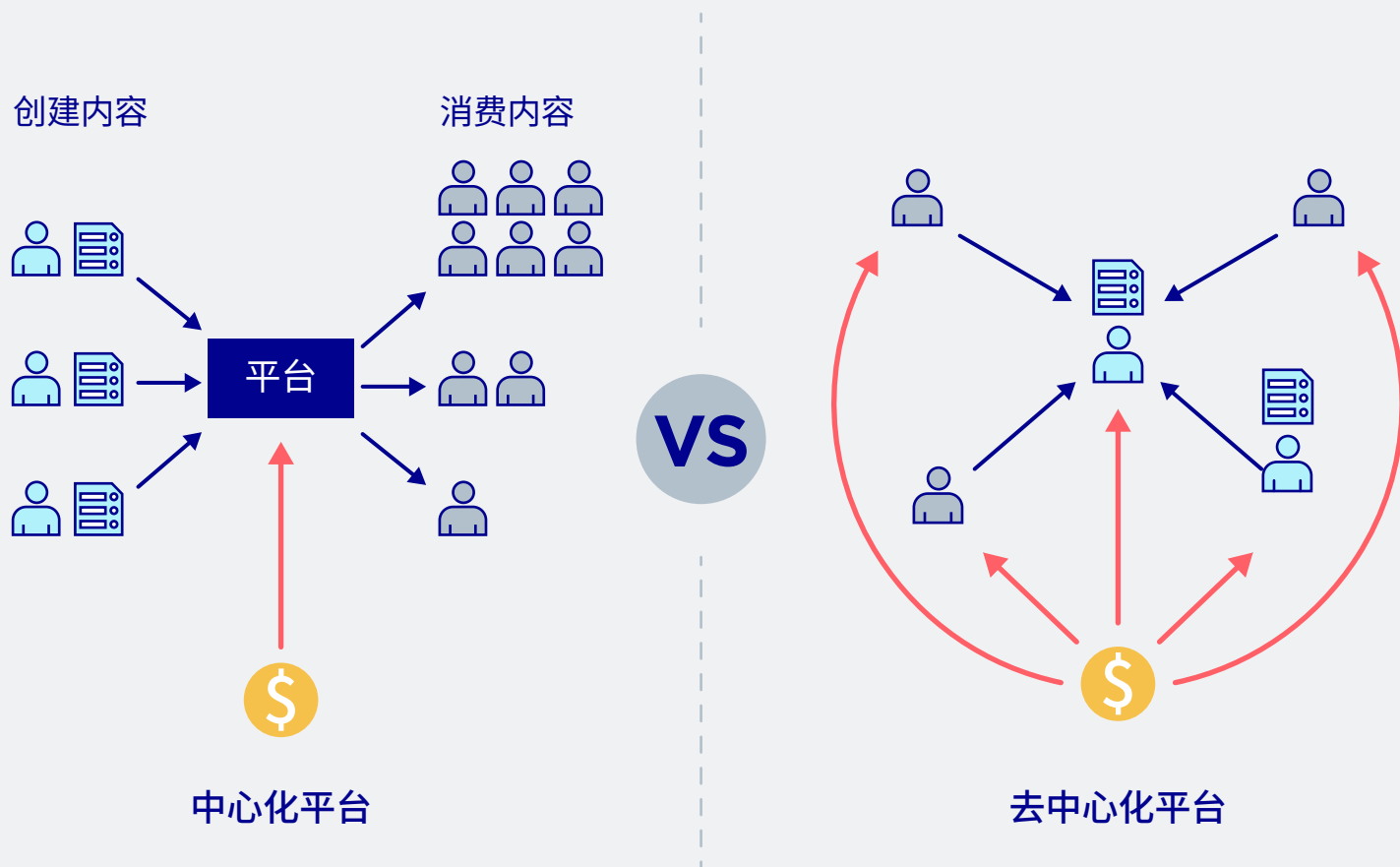


图1. 中心化平台和去中心化平台的对比。可以看到，中心化平台掌握着内容分发权，并且获得全部广告收益；在去中心化平台中，看到的内容有用户决定，广告推广收益流向了所有参与用户

区块链技术

区块链技术是一种去中心化的公共账本和共识算法,通过加密算法和智能合约保证社区内的全部用户共享和维护交易信息,确保在去中心化的情况下,系统内部信息真实透明,不可篡改和伪造,使得系统网络具有长期稳定的价值。

近年来,区块链技术得到了快速稳定的发展,在文件存储、网络安全、资产交易、银行结算、金融、医疗、供应链等诸多领域都取得了长足进展,已经开始渗入到广大用户的日常生活中。

据统计,2017年全球进行ICO的区块链项目就达到了600余个,2018年第一个月,确定将要进行ICO的项目已经超过了200个。截至目前,全球已经出现了近6000家数字货币交易所。

区块链技术 与社交网络

社交网络的出现为广大用户提供了低成本参与的社交平台,平台内的用户作为社交网络中的节点,聚集度较高,通过社交分享机制进入门槛低,具有快速扩散、快速聚集的特性,很容易形成网络效应。社交网络这样的特性和区块链去中心化的理念一致性很高,是区块链技术极佳的应用场景。

随着区块链技术的发展,基于区块链技术的内容社区开始涌入人们的视线,如国外的内容社区平台steemit.com利用区块链技术解决优质文章内容的筛选和激励,以挑选出对用户有价值的优质原创文章。但出于文章内容的专业性,普通用户难于参与其中,最终受到奖励的只是少部分明星用户,反而偏离了去中心化的初衷。

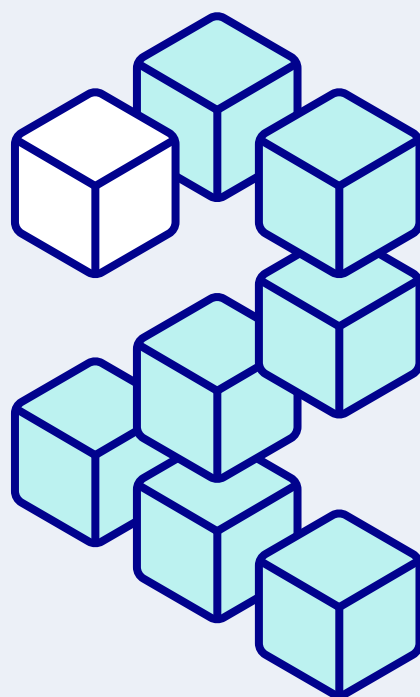
目前,基于区块链的社交网络的尝试中,更多是基于通信技术和解决方案的角度,还没有基于社交内容和行为奖励的尝试,但社交平台通过区块链技术进行去中心化已是大势所趋。

社交网络中的 代币激励

在区块链技术的基础上, 在社交网络中发行基础代币, 通过强大而灵活的代币政策, 激励用户的正向行为, 会为产品带来诸多价值:

- **更活跃的用户。**每个用户都是平台的股东, 每个用户对平台的贡献都能被清晰地识别, 并获得公平的奖励, 用户将更积极付出为平台做出积极的贡献。
- **健康的氛围。**符合产品价值观的内容会获得更多奖励, 高质量内容的产生, 有助于形成良好的产品氛围和产品调性。
- **指数级规模增长。**早期激励和良好的产品氛围有助于快速建立起用户口碑和产品品牌, 形成网络效应后, 后续的用户增长将水到渠成。

O2 TTC代币



TTC代币

TTC是基于区块链技术的通用代币,作为产品上智能合约和交易行为的运作媒介。相比于传统的挖矿获取代币的机制,TTC的发放更加看重用户行为对产品的贡献,用户可以创建自己的生活动态,或者发掘其他用户的动态以获取奖励。这种方式让用户的社交行为更有价值,有助于形成长期稳定的个人形象和风格,更大程度激励用户贡献并获取价值。

同时,第三方可以借助平台进行推广,与传统社交平台不同的是,推广的收益将以TTC的方式直接分配给选择参与的用户,让用户得到更多公平的奖励。

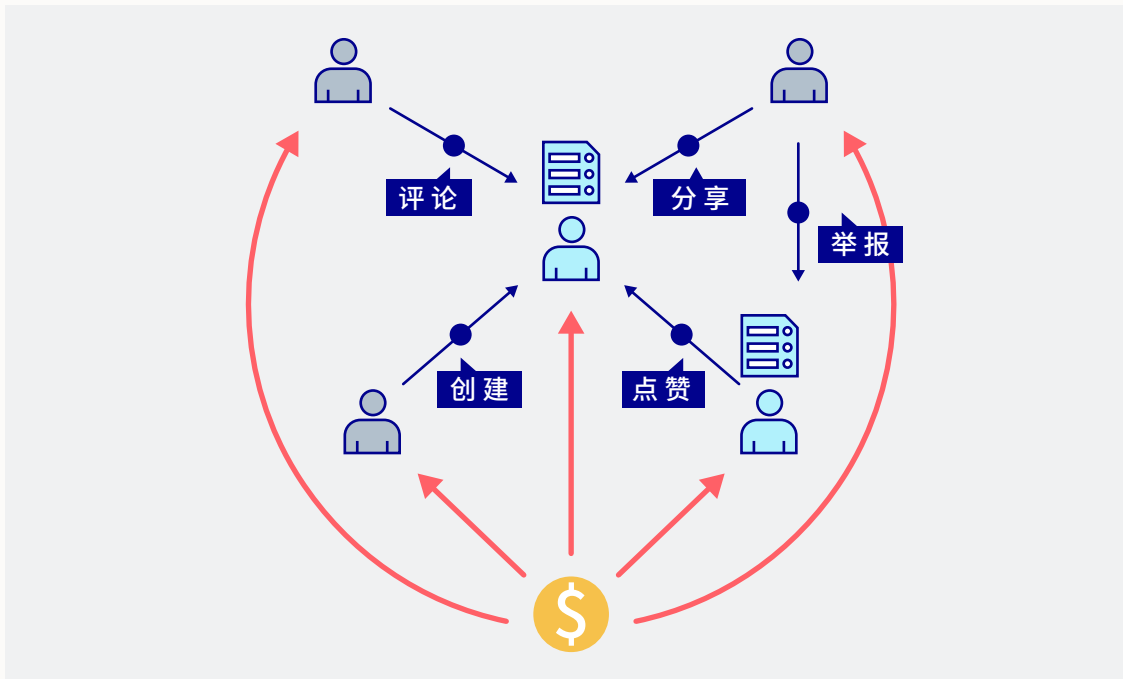


图2. 用户通过创建分发动态内容,并和其他内容互动来获取TTC奖励

tataUFO将是TTC体系中的初创成员,前期产品将依托于现有用户,随着产品机制的完善和影响力的扩大,越来越多的用户体会到去中心化的社交平台的价值,产品将逐步扩展到其他国家,为全球更多用户提供更优质的社交服务。

内容产品对比

	tataUFO	Steemit	Weibo	instagram
产品定位	个性化生活分享平台	原创个人博客	社会化媒体	图片社交平台
内容形式	个人动态	专业文章	综合资讯	个人动态
区块链技术	是	是	否	否
内容管理	用户	用户	平台	平台
内容分发	去中心化	高度中心化	中心化	中心化
内容审查监督	大部分用户	少量明星用户	平台	平台
用户获取内容奖励	是	是	少量明星用户	无
推广收益方	用户	无	平台	平台

表1. tataUFO、Steemit、微博、Instagram产品各角度对比,可以看到,tataUFO在底层机制和内容分发上都以去中心化作为目标,真正让广大普通用户能够在产品中获得更多社交价值

经济体系

TTC作为产品的通用代币,根据用户的贡献程度分配给平台用户,目前用户可以通过三种方式获取TTC奖励:

- **内容奖励。**用户通过创建生活动态向其他用户提供优质内容,内容优质与否放由产品内其他用户共同决定,用户通过对内容进行点赞、评论、分享、举报等互动操作表达对一个动态内容的态度。
- **声望奖励。**声望是为了激励长期为产品带来价值的用户而设计的体系,随着用户表现出对产品的忠诚度,不断创造优质内容,并被其他用户认可,其个人声望将不断提高。高声望的用户是产品理念的忠实拥护者,将持续获得声望带来的奖励。
- **推广奖励。**推广奖励由第三方提供,通过专题活动、品牌展示、用户调研等方式,邀请用户参与其中,为用户带来额外的奖励。

按照智能合约中的设定,包括内容奖励和声望奖励来自于发行奖励池,每天发行的数量是固定的,第三方推广的奖励来自于在平台上进行推广的广告商。

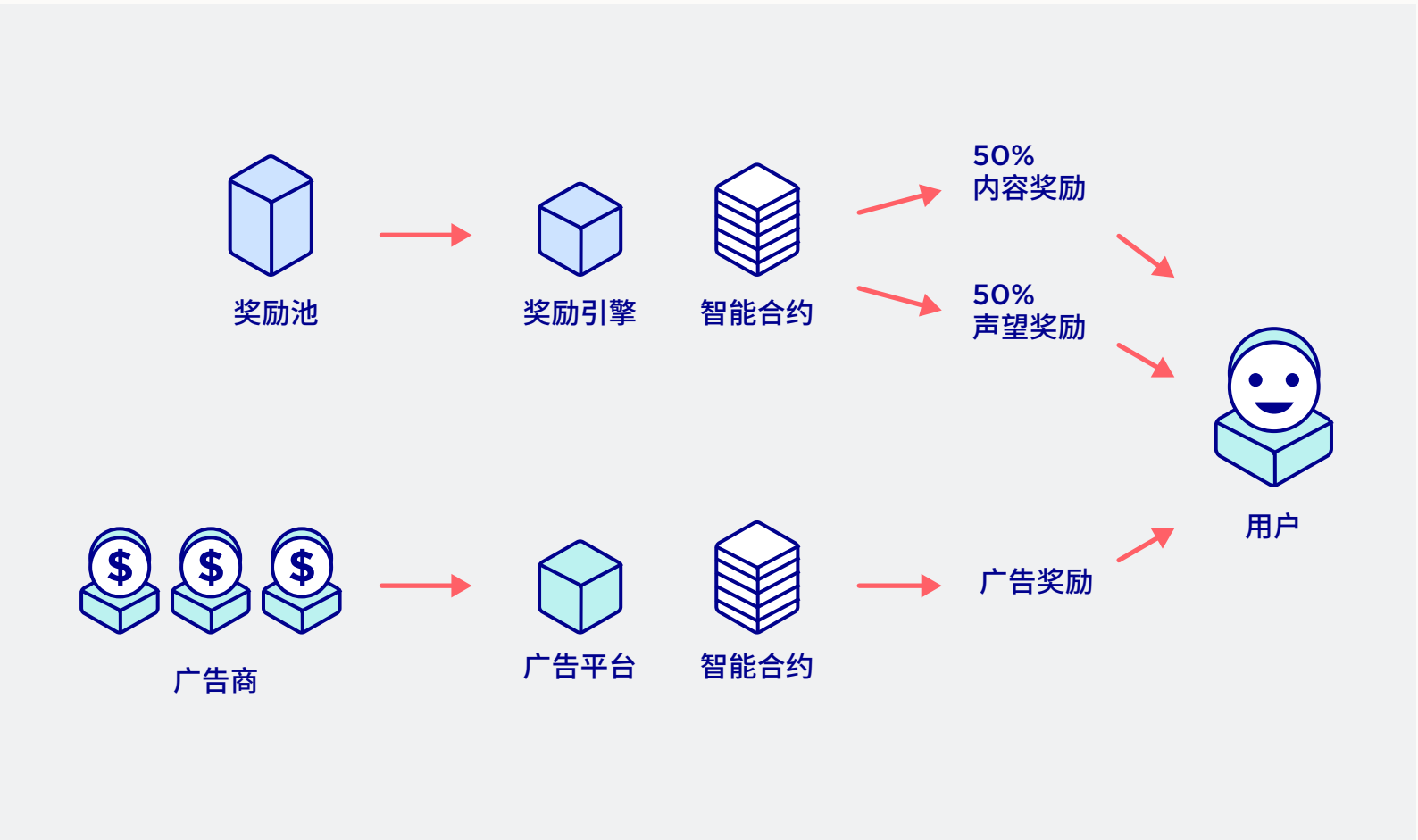


图3. 当日发行奖励池和推广奖励池示意

内容奖励

内容价值由与该内容互动的用户声望决定,当用户对一个动态内容进行点赞、评论、分享、举报操作时,该用户的声望会增加到该内容价值中。声望决定了用户对产品理念的接受程度,高声望用户对内容的挖掘和互动将为该内容提供较高的价值提升和曝光机会。

如果一条动态内容被分享到第三方平台,该内容的H5页面的曝光量也会计算到该内容的分享价值中。

内容价值 = Υ 点赞权重 * $\sum f$ (点赞者声望) + Υ 评论权重 * $\sum f$ (评论者声望) + Υ 分享权重 * $\sum f$ (分享者声望) - $\sum f$ (举报者声望)
(三种权重的初始比例为,点赞权重 : 评论权重 : 分享权重 = 30% : 50% : 20%)

当用户进行了点赞、评论、分享中的多种操作时,只保留其中价值最高的操作为内容贡献价值,不过每多做一种操作,贡献的声望值额外加1。例如,一个声望为12的用户对一条动态进行了点赞、评论、分享3种操作,则该用户贡献的内容价值为14。

如果有不符合产品理念的动态出现,用户可以对其进行举报操作,动态内

容价值将会扣减掉被举报用户的声望值,被举报用户的其他操作将不再计算分数。为了确保举报行为的公平性和公正性,将会有用户的审核委员会机制,以确保该项权利不被滥用。

内容价值决定了该内容的曝光机会,也决定了其在当天能分配到的内容奖励,内容价值将按照比例分配给内容创建者和参与互动者。

声望奖励

声望反映了一个用户在产品中的长期贡献, 用户持续关注产品, 创建大量优质动态内容, 被其他用户认可, 是反应用户长期贡献的要素, 同时产品内会有对举报动态的审核工作, 也是用户做出贡献的方式。

声望 = 登陆价值 + 创建内容价值 + 关注者价值 + 举报审核价值
(四种价值权重的初始比例为, 登陆 : 创建内容 : 关注者 : 举报审核 = 20 : 30 : 30 : 20)

用户声望的初始值为1, 上限为100。四种价值的获取均服从幂函数分布, 即声望增加的速度开始较快, 后续逐渐减缓。

- **登陆价值** 反映了用户对产品的忠诚度, 与用户登陆产品天数有关, 随着登录天数的增加, 后续登陆获得登陆价值的趋势逐渐减缓, 最后登陆价值趋近于20。

$$V_{\text{登陆}} = \log (n, Nd)$$

- **创建内容价值** 反映了用户在优质动态上的贡献, 与用户创建动态内容数量和内容的价值有关, 随着创建内容的增多, 对创建内容价值增加的趋势逐渐减缓, 最后创建内容价值趋近于30。

$$V_{\text{内容}} = \log (n, f (Nc, Vc))$$

- **关注者价值** 反映了用户被其他用户认可程度, 与用户关注者数量和关注者声望有关, 随着关注者数量增多, 对关注者价值增加的趋势逐渐减缓, 最后关注者价值趋近于30。

$$V_{\text{关注者}} = \log (n, f (Nf, Vf))$$

- **举报审核价值** 反映了用户在维护产品环境上的贡献, 与用户有效举报次数和正向审核次数有关。用户所进行的举报将通过由平台内其他用户进行审核, 如果一半以上参与审核成员认定该举报有效, 则举报者会增加一定的声望值, 否则举报者会扣除一定的声望值, 支持这一结果的参与审核用户也会增加声望值。随着举报和审核数量的增多, 对举报审核价值增加的趋势逐渐减缓, 最后举报审核价值趋近于20。

$$V_{\text{举报审核}} = \log (n, f (Nr, \text{audit(成功/失败)}))$$

推广奖励

平台为用户提供了通过参加第三方推广活动额外获得TTC的机制, 第三方通过其他渠道获得TTC, 参与每天的推广资源竞价, 竞价成功可以在产品中选择合适的推广方式进行推广。当前的推广方式包括专题活动、广告露出、用户调研等, 后续将会陆续有形式更丰富的推广方式。第三方推广所支付的TTC将会直接分配给参与推广活动的用户, 平台开发者会从中获取一定额度TTC作为平台维护费用。

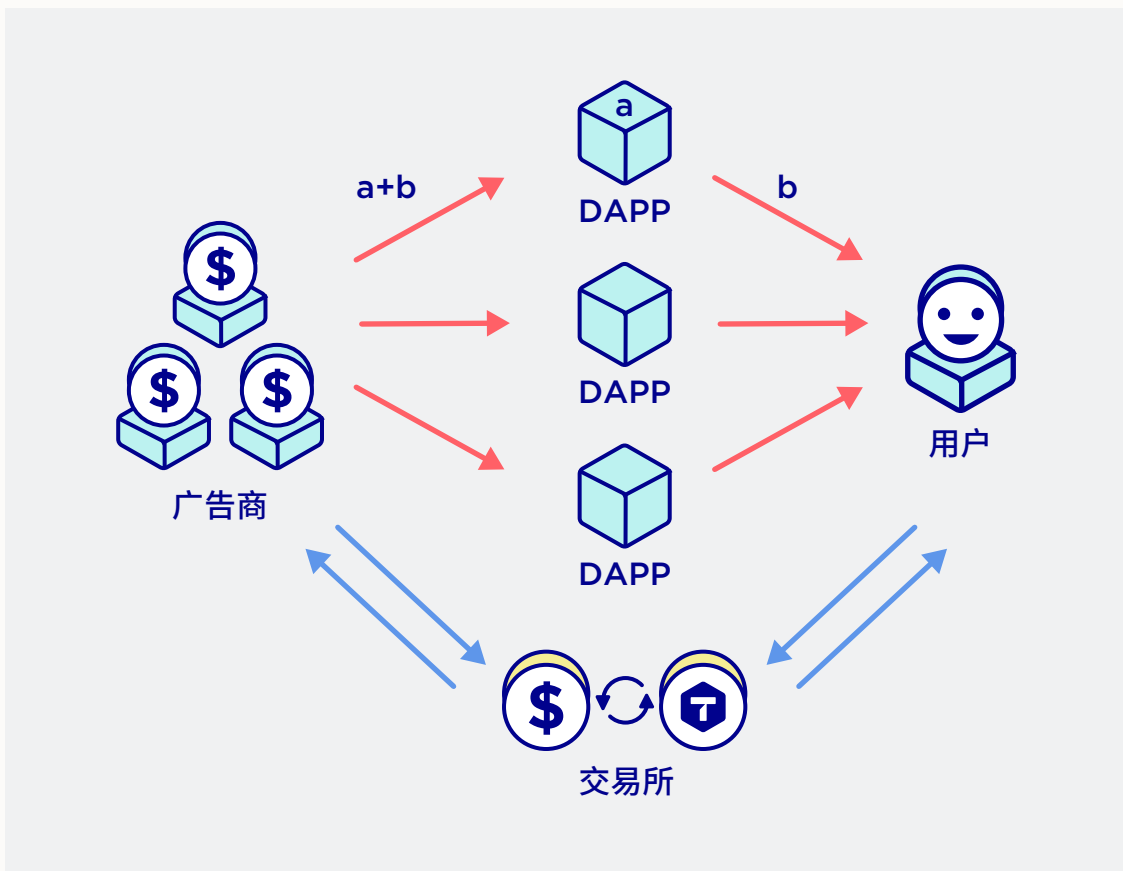


图4. 用户通过创建分发动态内容, 并和其他内容互动来获取TTC奖励

- **专题活动**

第三方在产品指定推广位置开启专题活动,用户可在该专题下创建内容,根据内容互动情况,按照一定规则将活动奖励按比例分配给参与专题活动的用户。



- **广告露出**

第三方选择某部分产品用户投放广告,按照展示、点击、行为等多种方式衡量广告效果,用户可以选择是否希望看到广告,广告投放的费用根据实际效果分配给观看广告的用户。



- **用户调研**

第三方选择某部分产品用户投放调查问卷,按照回收情况衡量投放问卷效果,用户可以选择是否参与调研,问卷投放的费用根据实际效果分配给参与调研的用户。



奖励机制

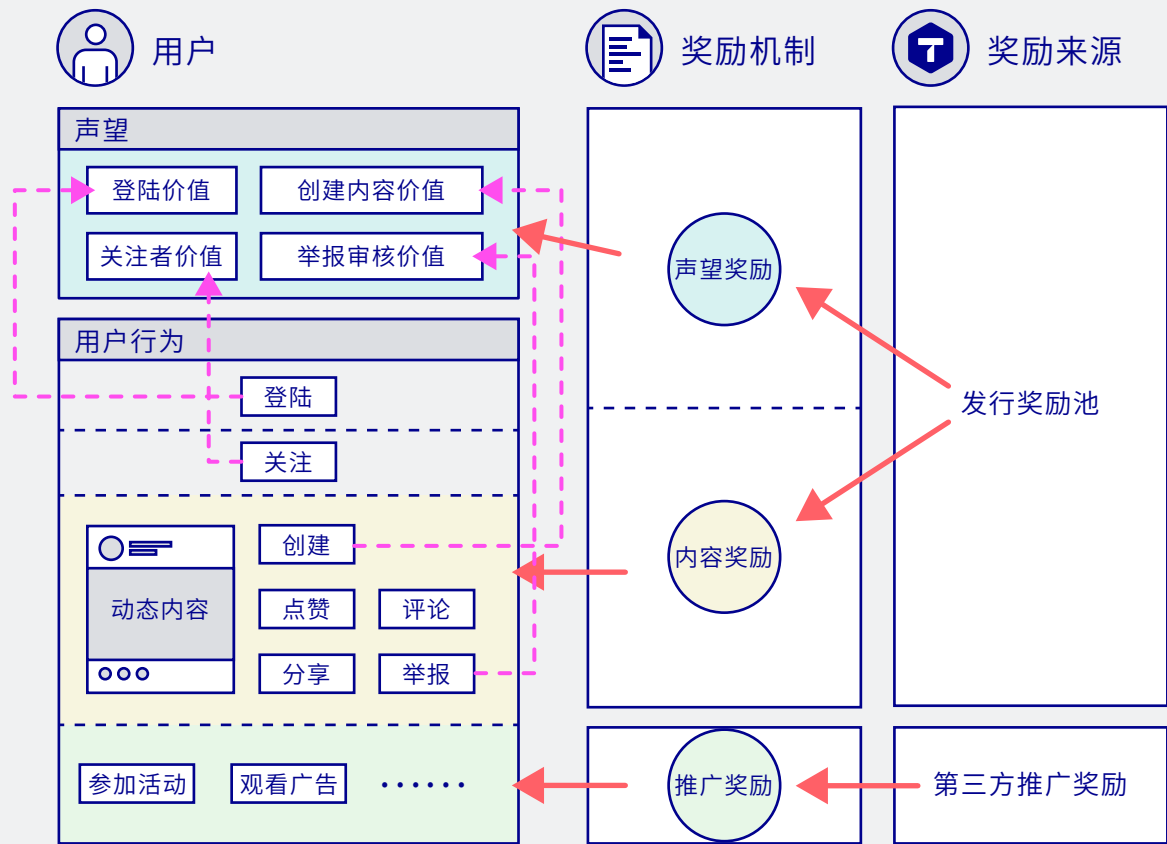


图5. 用户行为及奖励的价值链条。用户在产品中进行创建动态并和其他动态互动，以分得每日内容奖励；而随着用户不断使用产品，登陆、关注、创建、举报、审核等功能会从不同维度提升用户的声望，进而为用户带来声望奖励；通过参加第三方推广活动，用户可以获得第三方投放提供的推广奖励

产品在每天24:00(格林威治时间)结算当天发放的奖励，奖励在发行奖励池和推广奖励池中进行分配。发行奖励池是根据发放原则制定的，每天发放的数量从一开始就固定下来，每日固定的发行奖励包括短期的内容奖

励和长期的声望奖励, 初始设定两者所占的比重为1:1。推广奖励池由第三方提供, 根据实际第三方参与情况确定。

- **内容奖励**

- 内容奖励分配给用户每天产生的动态内容, 取决于每个动态所产生的内容价值。
- 用户创建的动态内容自创建时间开始计算价值, 至24小时计算截止。每个内容的价值计算周期都会经历完整的24小时, 会参与一次且仅有一次的奖励分配, 该内容将会在计算截止当天的24:00参与奖励分配。内容价值计算截止后的互动操作将不会对该内容价值产生影响。
- 每个内容的价值按一定比例分配给创建者和互动者, 初始设定为黄金分割比例, 及创建者分得61.8%, 互动者分得38.2%。
- 互动者之间, 根据先后顺序按一定比例进行分配, 初始设定为斐波那契数列比例。例如有5个用户参与, 第一个到第五个用户分别分得 $8/19$, $5/19$, $3/19$, $2/19$, $1/19$ 。

- **声望奖励**。声望奖励分配给参与产品的每一个用户, 根据用户前一天的声望值按比例分配。高声望用户对产品做出了长期贡献, 可以长期获得奖励, 类似于股权分红的概念。

- **推广奖励**。每天参与推广活动的用户将获得额外的推广奖励, 数量由第三方投放情况决定, 按规则奖励给参与推广活动的用户。

露出机制

产品内有较多的动态露出机制, 保证每个用户都能看到多种不同的动态。用户感兴趣的内容会优先露出, 同时也会把产品内其他用户选出的高价值内容优先让用户看到, 此外产品鼓励用户根据自己的兴趣专长, 挖掘质量高的内容并展示给与自己相关的用户。

- **我的关注。**在“我的关注”模块, 用户可以看到自己关注的用户创建的内容, 同时关注的用户进行过点赞、评论操作的内容也会出现。该模块下的内容将根据创建者声望、互动者声望及时间维度进行综合排序。
- **近期热门。**在“近期热门”模块, 用户可以看到最近一段时间产生的内容价值最高的内容, 每1分钟更新一次价值分数排序。该模块下的内容将根据互动者声望及时间维度进行综合排序。
- **发现。**在“发现”模块, 用户可以看到产品内的全部动态内容, 内容将通过聚合产生标签, 通过不同的标签, 用户可以更好选择自己感兴趣和专业的领域, 进而凭借自己的慧眼挖掘出有价值的内容。该模块的内容按照时间排序, 用户可以获取关注过的标签下的最新内容。

平台环境

在一个去中心化的平台上, 存在少数用户滥用产品规则, 获取不公平奖励的情况, 对产品生态环境和长期价值有较大影响。通过合理的产品机制, 以及用户之间的相互监督, 确保不符合产品理念的内容及行为受到惩罚, 并最小化其对其他用户造成的影响。

- **系统识别。**通过系统算法识别出预先设定的有规律的恶意产品行为, 如多次无意义评论, 该行为的结果将被静默处理, 该用户将没有权利分得任何奖励。
- **举报机制。**用户可以对平台内展示的动态内容进行举报, 内容被举报的次数超过一定值后, 内容的价值及露出的几率将大幅下降, 由于内容价值低, 该内容的创建者将很难分得相应的内容奖励和声望奖励
- **审核机制。**当某个动态被举报次数较多时, 达到一定声望值的用户将可以看到被举报内容并参与举报审核。如果一半以上参与审核的用户认定该举报有效, 该内容将不再公开展示, 发布者会被扣除一定的声望值, 举报者和支持这一结果的参与审核用户均会增加一定的声望值。如果一半以上参与审核的用户认定该举报无效, 则发布内容不受影响, 举报者会被扣除一定的声望值。

应用场景

TTC作为平台通用货币,有不同的使用场景帮助用户获得更好的产品体验。第三方开发者可以充分利用平台开发有价值的服务,用户通过支付TTC获取这些服务。以tataUFO为例,用户可以通过消费TTC获得以下特权:

- **表情包**

用户可以通过TTC购买第三方爱好者制作的表情包,在用户日常交流过程中使用,以获得更好的社交体验,用户花费的TTC将分给表情包制作者。



- **聊天机器人**

聊天机器人能让用户更快速方便地获取信息和服务,如天气预报、当前汇率等,用户可以支付TTC给开发者以订阅相应的聊天机器人服务。



- **发起投票**

当用户需要其他用户的意见时,可以通过支付一定数量的TTC发起一个投票,其他用户可参与投票给该用户意见反馈,并且按比例获得发起投票用户支付的TTC。

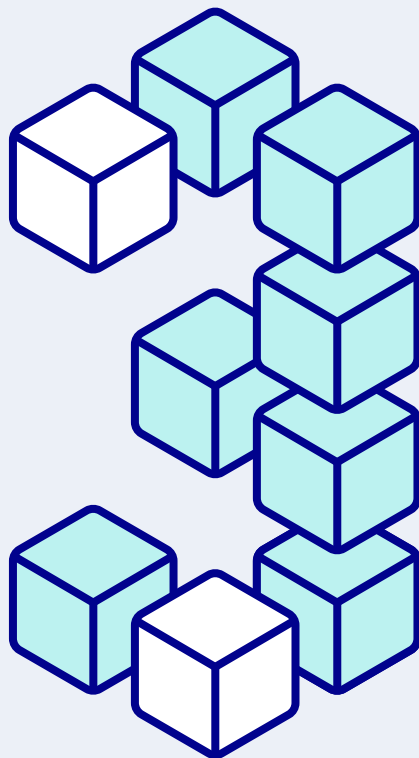


- **发私信**。在产品中,只有互相关注的用户才可以聊天,用户可以在双方尚未成为好友前,通过支付一定数量的TTC来获取发私信的机会,所支付的TTC将直接转给被私信方。
- **折扣券**。TTC还可以用于兑换线上线下商品代金券,让用户获得更多实际价值。

其他的DAPP可根据产品形态和调性设计更为丰富的TTC应用场景,如打赏、付费推广、互动游戏等等,以帮助用户更好体验TTC在产品中的价值。

O3

TTC 生态系统



TTC生态系统

为了让去中心化和货币化的社交网络能有更广泛的应用,给更多的用户提供真正有意义的社交价值,TTC开放平台为广大开发者提供一整套便于接入和管理的应用开发接口协议和清算系统,任何开发者都可以通过TTC开放平台开发属于自己的区块链应用,并在平台上进行发布和推广,通过去中心化和货币化的理念,快速获取用户,在为用户提供更多价值的同时实现商业价值。

同时,TTC开放平台将为各DAPP的广告商提供统一的广告平台,TTC作为广告平台的通用代币。广告商可以选择多个DAPP的用户群体,动态组合优化广告费用的分配,以增加广告覆盖群体的多样性,带来更大的广告价值。

随着TTC开放平台影响力的扩大,越来越多的DAPP加入到TTC体系,会为平台带来如下影响:

- TTC上DAPP的用户之间将使用同一套用户系统进行管理,用户在不同DAPP之间实现价值交叉变得可行,将会提升整个TTC体系的丰富性和健壮性。
- 随着开放平台内用户量和多样性的提升,第三方投放数量也随之扩大,推广形式更多元,TTC体系的整体商业价值增加。

- 由于TTC总量不变, 持续增长的第三方推广使得TTC的价值持续提升, 后续每个用户每天获得的TTC减少, 但所持有的TTC将更有价值。

tataUFO作为开放平台上的初创成员, 将首先完成个性化生活分享平台的构建, 后续的开发者的可以在TTC开放平台上获得更加稳定的服务, 让全球更多用户体验到去中心化和货币化社交网络的价值。

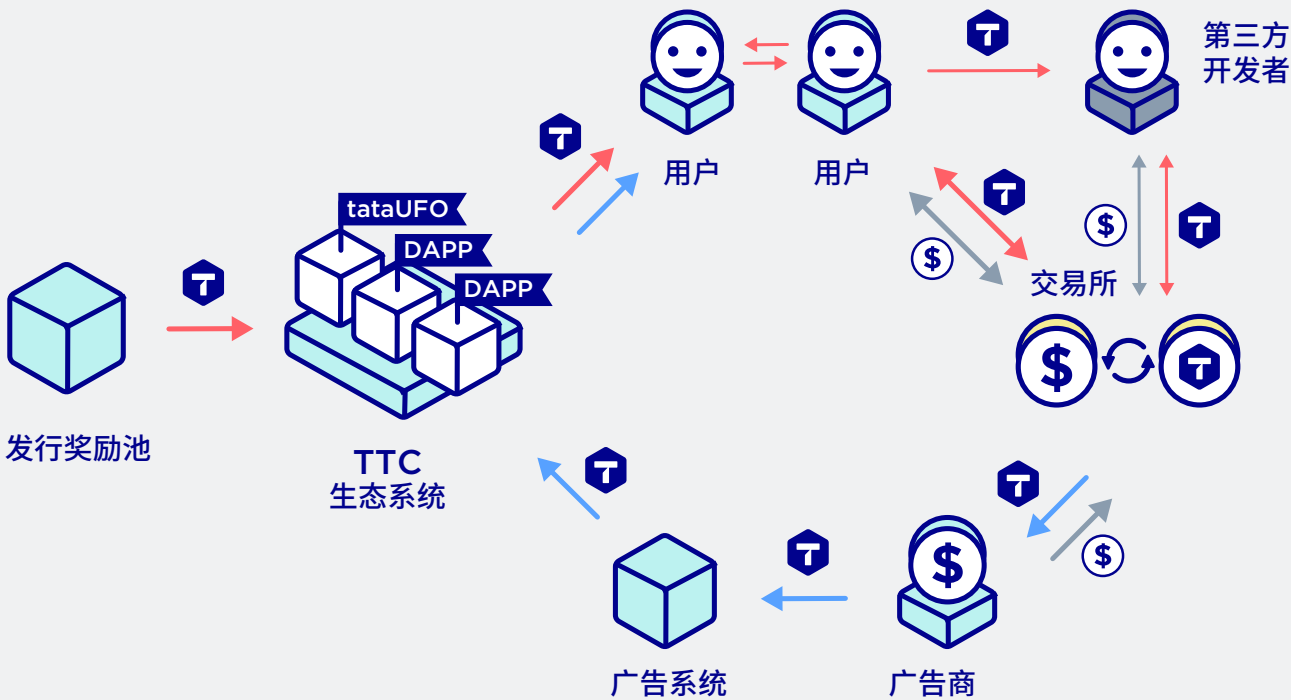


图6. TTC开放平台及价值链条

tataUFO

tataUFO于2013年上线,是一个基于年轻人社交网络的个性化生活分享平台,通过用户向好友及其他用户展示自己的生活动点,促进用户间的互动和关系建立,创建一个属于年轻人的动态分享和社交关系圈。



tataUFO借助大数据和云计算,给用户提供精准的“个性化推荐”服务,帮助用户发现可能感兴趣的新鲜内容和结交更多朋友,同时用户也能在tataUFO中与自己的朋友交流互动。

在经过将近5年的持续运营中,tataUFO始终致力于为年轻人提供社交分享平台,产品目前已经有超过1000万的注册用户,核心用户为中国一二线城市的高校学生和年轻人群体,用户对产品形成了较强的品牌认知和忠诚度,也为产品后续的发展和尝试提供了坚实的基础。

tataUFO接下来将作为TTC开放平台上第一个DAPP,利用区块链技术为用户提供去中心化的社交网络服务,通过开放稳定公平的机制,对现有平台进行升级,为用户提供更大的社交价值。

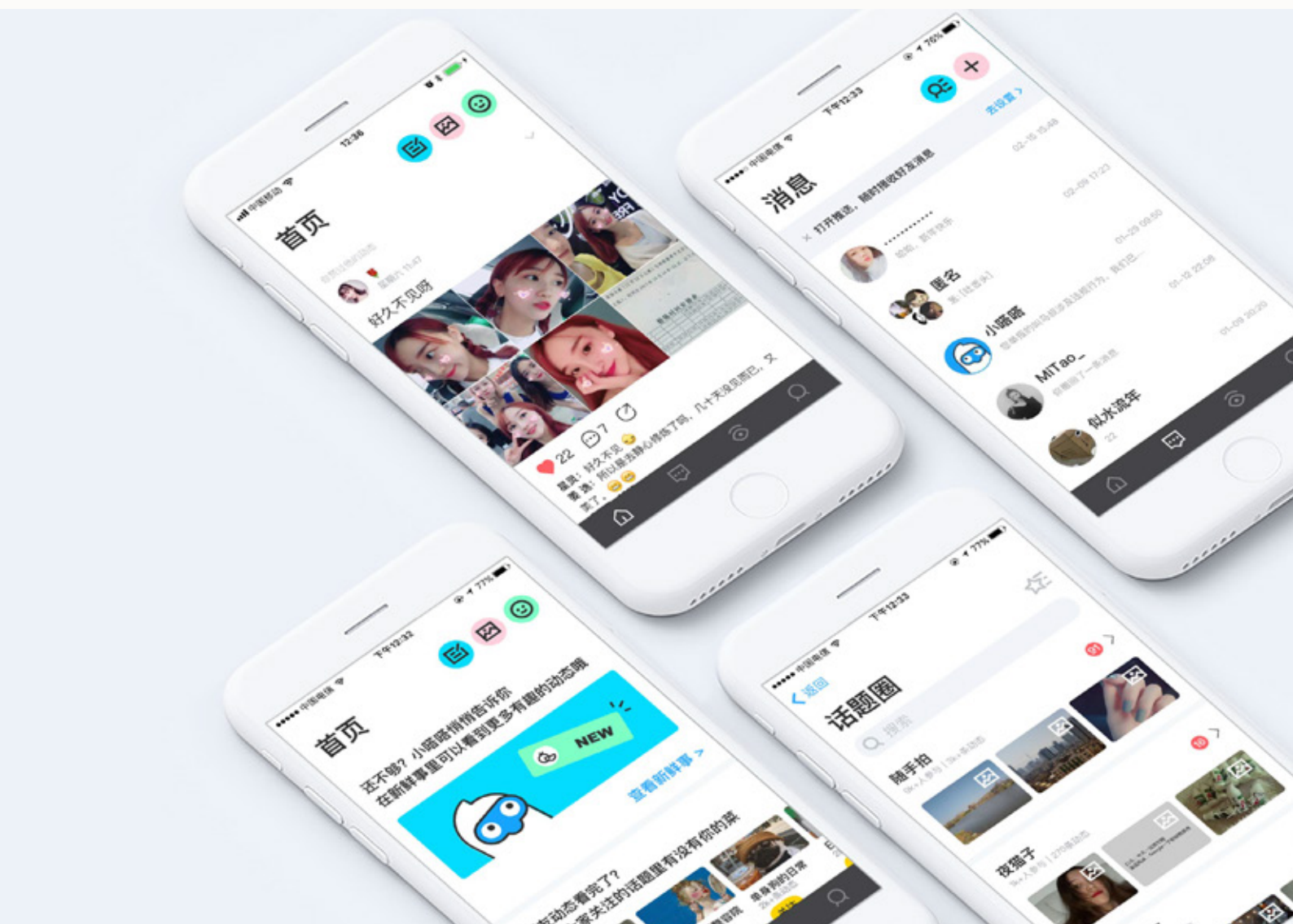
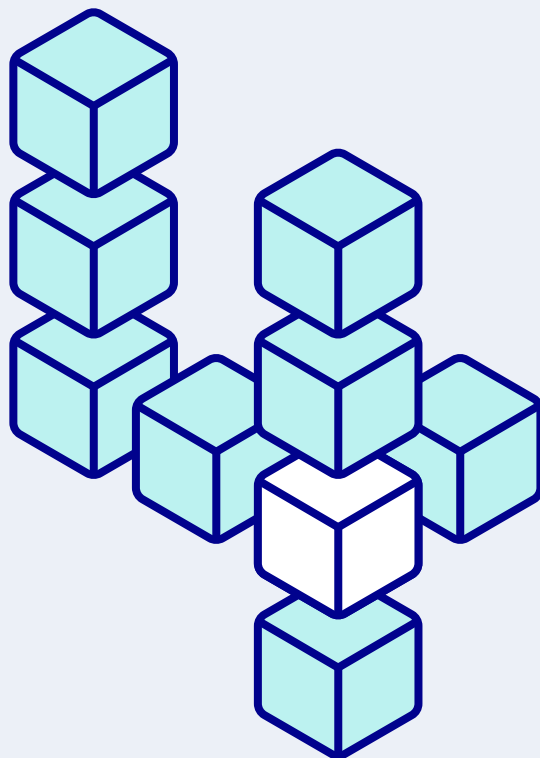


图7. tataUFO产品示意

04

TTC
基金会



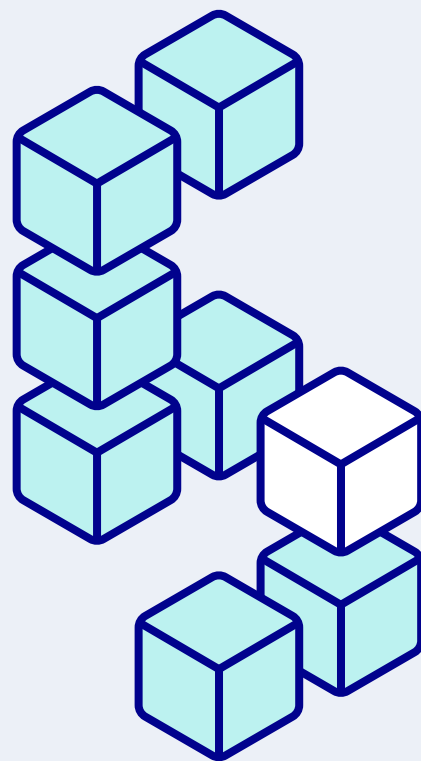
TTC基金会

TTC基金会是一个独立、民主、非营利的治理机构,用来对TTC进行开放治理,确保生态体系正常有序地运行, TTC基金会的职责包括:

- 通过增加TTC开放平台上的DAPP, 建立全球的社交生态系统。
- 确立一套公平透明的治理流程, 对TTC奖励引擎、参与规则、法律事项、内容合规准则的相关决策进行监督。
- 建立并完善去中心化及货币化社交网络的智能合约, 推动用户价值的提升和网络效应。
- 支持基于区块链技术的社交网络生态系统的完善, 指导和资助第三方开发者, 并制定TTC对体系中的各DAPP的动态分配机制, 使生态系统持续发展并创造更大价值。

为了加快TTC全球生态系统的建立, TTC基金会将积极调用及分配资源为开放平台获取更多的DAPP, 通过优质的DAPP为整个TTC生态带来更多用户。同时, TTC基金会将寻找介入TTC生态系统中有增长潜力的领域, 通过积极的投资和并购, 实现TTC平台的快速增长。

O5 技术考量



在链与脱链平衡

TTC将在Ethereum平台上进行开发, Ethereum作为目前使用最广泛的区块链网络, 在较好的稳定性和通用性之外, 也有一些潜在的问题。随着Ethereum上DAPP及用户数量的增加, 目前其上DAPP每天的交易量目前已经超过10万笔, 大量的交易量导致平台处理交易的响应速度变慢, 对用户使用带来很大麻烦。另外, 基于Ethereum区块链的交易需要为每笔费用支付交易费用, 也给用户带来了一定的经济损失。

基于此, 我们将实施混合式在链与脱链交易服务。基于TTC的交易将在Ethereum区块链上记录, 同时TTC基金会将开发一个脱链分类账系统, 用以记录用户的普通行为, 并在与交易行为有关的时间节点上进行区块链同步和计算, 以最大提高系统的效率, 并对基于TTC系统上的全部DAPP具有良好的可扩展性。在取得在链与脱链平衡之后, DAPP中的用户将享受相对流畅且标准统一的用户体验, 并且满足了TTC平台的可扩展性。

TTC基金会将持续优化在链与脱链交易服务, 为所有的DAPP和用户提供最好的产品体验。我们将致力于实现完全在链的方案开发, 届时TTC生态体系将脱离Ethereum平台, 成为独立的区块链解决方案。

技术架构

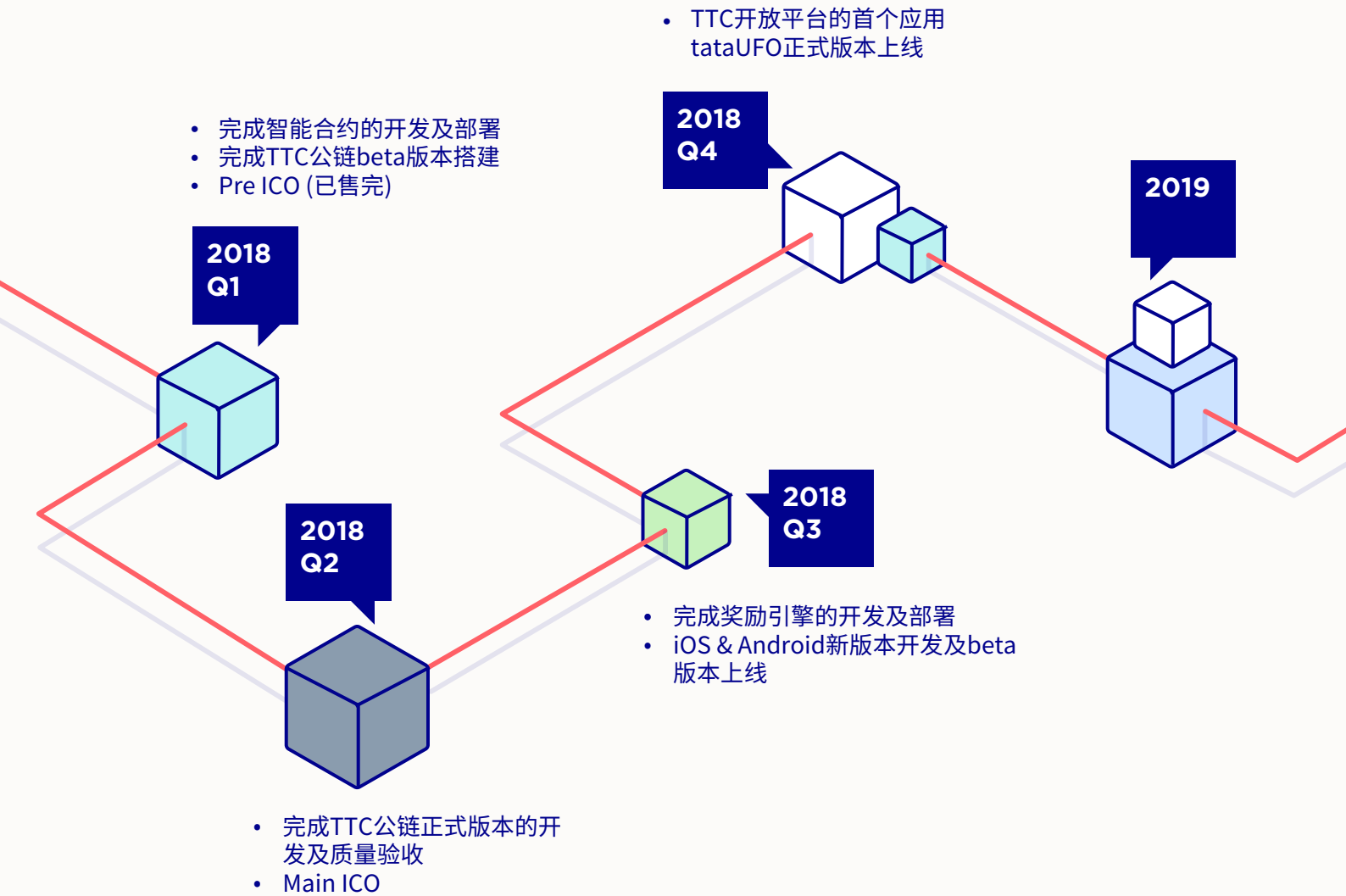
技术实现上TTC体系由4个层次组成：

- **区块链工具层**。底层框架，提供了数据库、网络、区块格式、共识算法等服务。
- **TTC核心层**。实现统一授权、代币系统、收益分配、钱包等核心业务逻辑。
- **TTC开放平台**。提供统一的内容、评分及用户管理，反作弊及审核解决方案、广告平台等。
- **服务与应用层**。第三方开发者可开发自己的服务与应用，参与到TTC生态体系中。



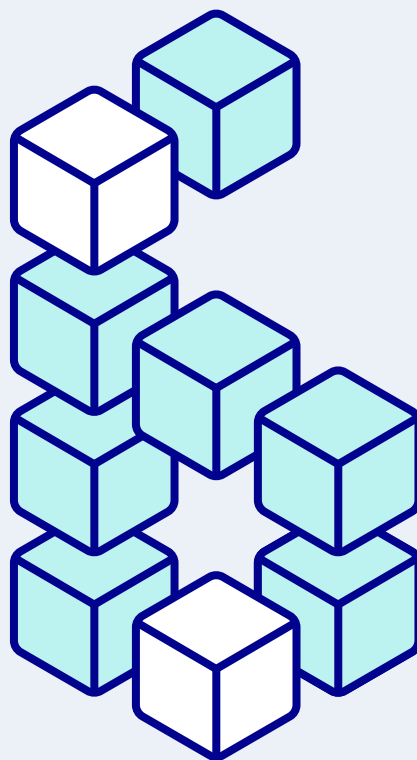
图7. TTC系统的技术架构

路线图



O6

TTC 发行计划



价值模型

产品TTC奖励池的发行将按固定计划进行, 自产品正式启动开始, 第一年发放总奖励池的50%, 从第二年起每年发放的总奖励金额减半。同一年中, 每天发放的数量相同, 按照内容奖励和声望奖励两部分分配给产品用户。

$$TTCEachMonth = \frac{RewardPool}{(2y*12)}$$

$$TTCperuserEachMonth = \frac{TTCEachMonth}{Total\ User}$$

由图7所示, 随着用户量的增长, 用户平均每天获得的TTC数量递减。

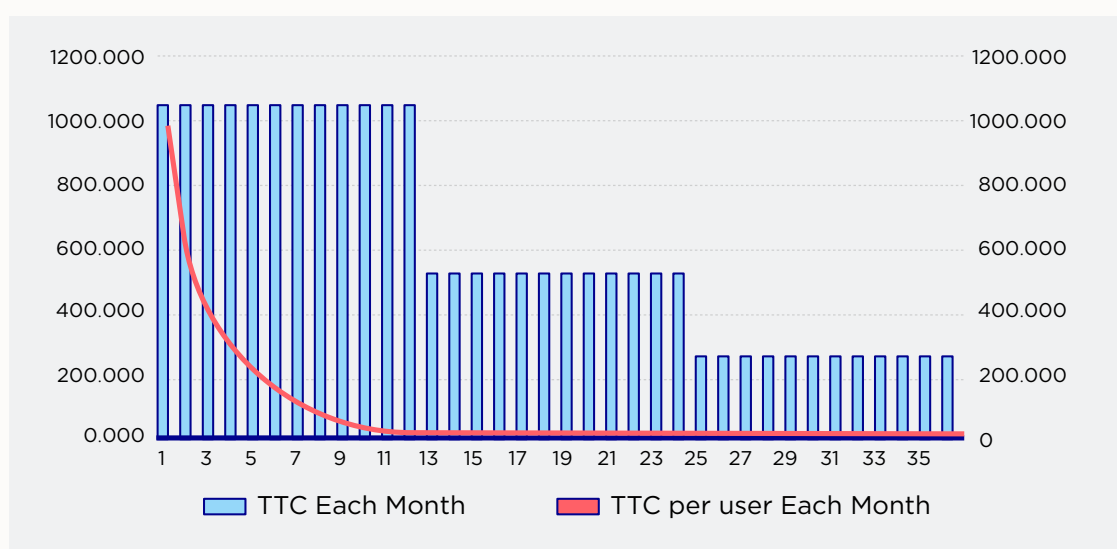


图8. TTC发放计划及用户获取TTC随时间的变化示意

在不考虑交易所影响的情况下, TTC的价值取决于第三方的推广费用。根据其他平台(如今日头条)推广数据参考, 当产品用户量较低时, 每用户每月可贡献 0.15USD 的推广收入, 当用户量级较高时, 每月贡献的推广收入可达到 1.5USD。根据社交产品共性及tataUFO产品特点, 用户活跃情况随着用户量增加, 先从100%下降到42%, 后涨回约50%。

$$\begin{aligned}
 MAU &= TotalUser * ActiveRate \\
 USDValueperTTC(withoutExchange) &= \frac{AdsRevenueEachMonth}{TTCEachMonth} \\
 &= \frac{MAUEachMonth * AdsWeight}{TTCEachMonth}
 \end{aligned}$$

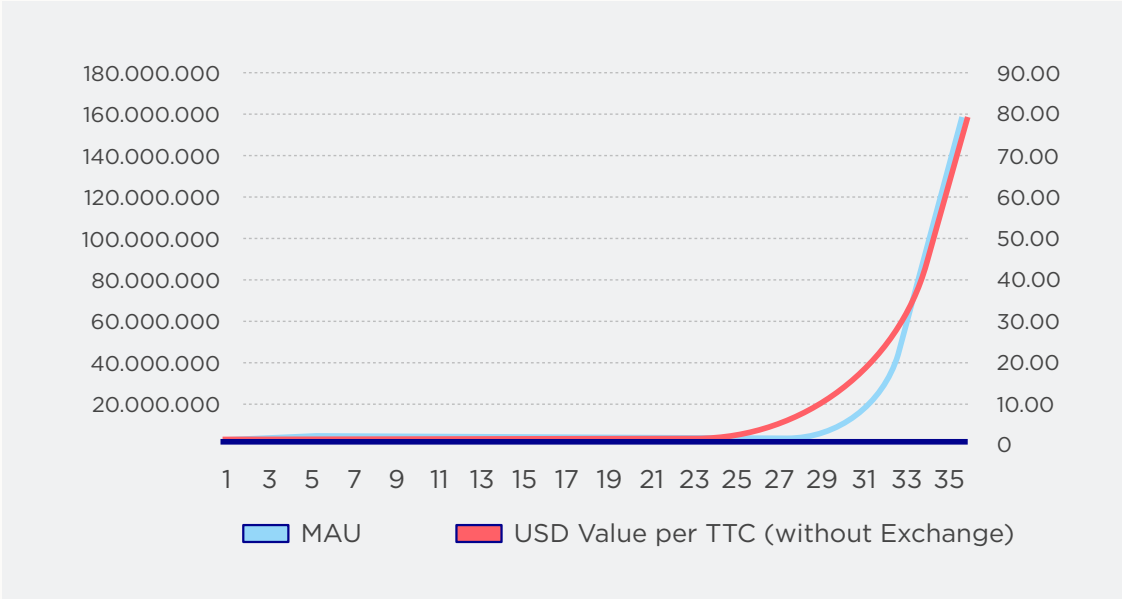


图9. 每TTC与美元的价值和MAU的关系

仅考虑产品因素导致的价值变化, 不同预期下TTC相对于美元的价值在3年内的增长情况:

		初 始	一年后	两年后	三年后
乐观版	TTC总价值		2,444,310	240,267,762	19,821,693,989
	用户量		508,066	13,767,563	328,058,424
	TTC价值(USD)	0.01	0.02	1.41	101.65
保守版	TTC总价值		2,091,044	127,842,748	7,750,245,530
	用户量		447,690	8,112,224	146,257,080
	TTC价值(USD)	0.01	0.02	0.75	39.74
悲观版	TTC总价值		1,966,611	89,841,255	3,604,161,409
	用户量		426,002	6,043,228	75,981,640
	TTC价值(USD)	0.01	0.02	0.53	18.48

表2. 不同情况下TTC价值在3年内的增长情况

ICO方案

TTC将在ERC20平台上进行发行, 发放总量为1,000,000,000。其中的25%将用于ICO发售, ICO参与者可以通过以太币(ETH)购买TTC。

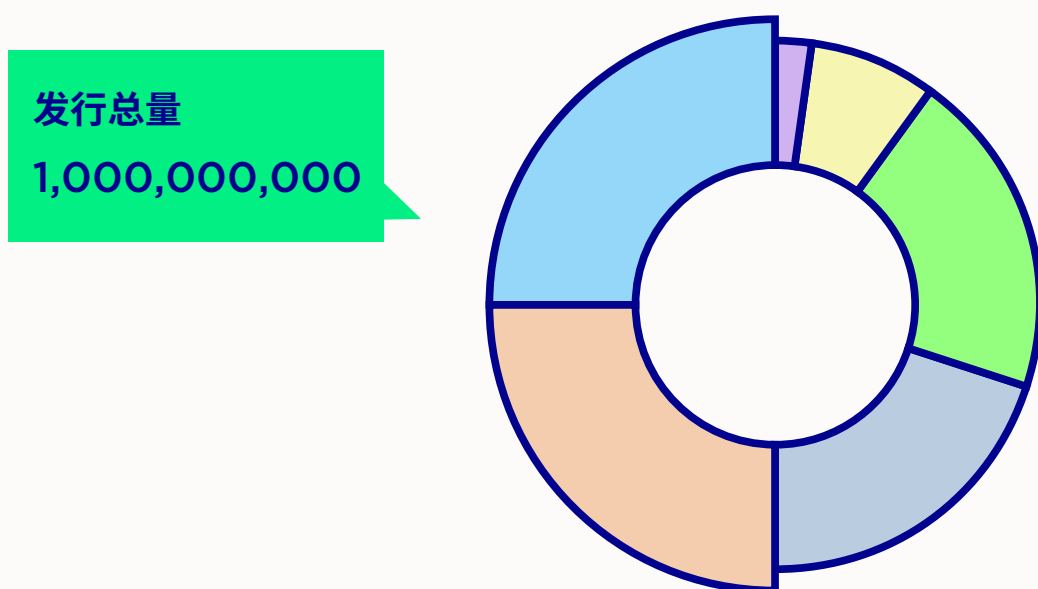
General Information

代币名称	TTC
发行平台	Ethereum
标准	ERC-20
支付方式	Ether (ETH)

Pre-initial TTC token sale : 1ETH = 5,000TTC

Initial TTC token sale : 1ETH = 4,000TTC

TTC 分配方案



早期发售

25% 250,000,000 TTC

奖励池

25% 250,000,000 TTC

生态建设

20% 200,000,000 TTC

基金会

20% 200,000,000 TTC

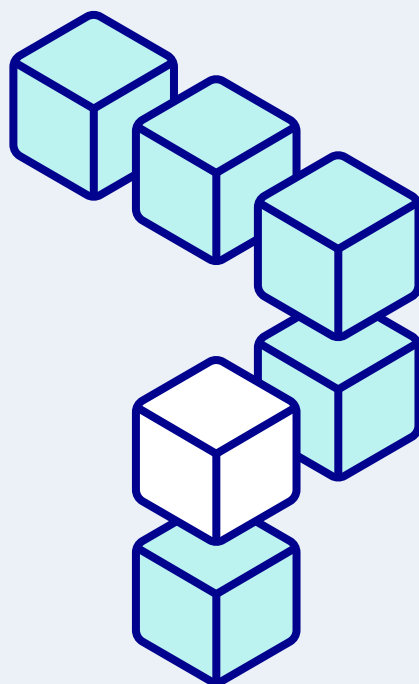
团队

8% 80,000,000 TTC

老用户/ bounty

2% 20,000,000 TTC

07 团队



核心成员



郑琰宇
主席&创始人

北京大学, 金融学
tataUFO, 创始人& CEO
曾就职于软银韩国风险投资公司, 擅长IT领域风险投资



Chase Chang | 生态建设副主席

威斯康辛大学麦迪逊分校
Retrica Inc, 首席运营官
LINE支付, 全球业务发展副总裁
LINE泰国, 首席合伙人



陈士华 | CTO

清华大学
北京360行科技有限公司 CTO
北京智明星通有限公司 技术总监



汪义骁 | 产品总监

中国人民大学
北京呼应网络科技有限公司, 联合创始人兼副总裁

**张鹤 | 设计总监**

四川美术学院
The Brand Union、东道设计公司, 设计总监
曾获红点奖、IF奖、意大利A Design奖、亚洲最具影响力设计大奖、中国设计之星奖

**吴杰 | Growth总监**

上海海洋大学
大众点评, 高级商务经理

**刘鹏 | 技术组长**

清华大学/瑞典达拉纳大学
北京捷通华声语音技术有限公司, 副总监

**王向阳 | 技术组长**

清华大学
三星通信研究院、爱可信中国、LG电子, 高级研发工程师

**张良 | 技术组长**

山西师范大学
北京购阿购技术服务有限公司、北京热火朝天科技有限公司, 高级研发工程师



莫逸 | 高级产品经理

北京航空航天大学
搜狐畅游, 社交产品负责人



郭世浩 | 高级产品经理

河南大学
北京北方信息技术有限公司, 高级研发工程师



马云骥 | 设计组长

北京交通大学
北京十月逸栈网络科技有限公司, 资深设计师

顾问



Simon Kim
Hashed, CEO & 合伙人
软银风险投资, 风险合伙人



张原
比特大陆, CEO助理、区块链产品经理



周硕基
FBG Capital创始合伙人



蔡剑
北京大学光华管理学院教授



Ryan Kim
Hashed, 合伙人、首席行政官



曹洪伟
百度, 渡鸦科技CTO

White Paper Disclaimer

IMPORTANT: YOU MUST READ THE FOLLOWING DISCLAIMER IN FULL BEFORE CONTINUING

The TTC Protocol is intended to be maintained by TTC Foundation and/or its affiliate(s). References in this White Paper to TTC Foundation shall be deemed to include a reference to such affiliate(s).

The sale ("Token Sale") of TTC tokens ("Tokens") is only intended for, made to or directed at, and to be acted upon by only person(s) (a) who is not a citizen, domiciled in, or resident of the United States of America or the People's Republic of China (which for the purpose of these Terms, shall exclude the Hong Kong Special Administrative Region of the People's Republic of China, the Macau Special Administrative Region of the People's Republic of China, and the Republic of China) ("PRC"); and (b) outside the United States of America or PRC.

By accessing and/or accepting possession of any information in this White Paper or such part thereof (as the case may be), you represent and warrant to TTC-Foundation Pte. Ltd. (Singapore Company Registration Number 201808413G) ("TTC Foundation") that:

- (a) you are not an Excluded Person (as defined herein), or a citizen or resident of a country the laws of which prohibit or conflict with the Token Sale or your participation in the Token Sale (as referred hereto in the White Paper);
- (b) you agree to be bound by the limitations and restrictions described herein; and
- (c) you acknowledge that this White Paper has been prepared for delivery to you so as to assist you in making a decision as to whether to purchase Tokens.

IMPORTANT INFORMATION

PLEASE READ THIS DISCLAIMER SECTION CAREFULLY. IF YOU ARE IN ANY DOUBT AS TO THE ACTION YOU SHOULD TAKE, YOU SHOULD CONSULT YOUR LEGAL, FINANCIAL, TAX OR OTHER PROFESSIONAL ADVISOR(S).

This White Paper in its current form is circulated by TTC Foundation for general information and to invite participant feedback only on the TTC protocol (the "TTC Protocol") and the Tokens as presently conceived, and is subject to review and revision by the directors and/or advisors of TTC Foundation. Please do not replicate or distribute any part of this White Paper without this section in accompaniment. The information set forth below may not be exhaustive and no part of this White Paper is intended to create legal relations between a recipient of this White Paper or to be legally binding or enforceable by such recipient against TTC Foundation. An updated version of this White Paper may be published at a later date and to be announced by TTC Foundation in due course.

PLEASE READ THIS SECTION AND THE FOLLOWING SECTIONS ENTITLED "DISCLAIMER OF LIABILITY", "NO REPRESENTATIONS AND WARRANTIES", "REPRESENTATIONS AND WARRANTIES BY YOU", "CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS", "THIRD PARTY INFORMATION AND NO CONSENT OF OTHER PERSONS", "TERMS USED", "NO ADVICE", "NO FURTHER INFORMATION OR UPDATE", "RESTRICTIONS ON DISTRIBUTION AND DISSEMINATION", "NO OFFER OF INVESTMENT OR REGISTRATION" AND "RISKS AND UNCERTAINTIES" CAREFULLY.

IF YOU ARE IN ANY DOUBT AS TO THE ACTION YOU SHOULD TAKE, YOU SHOULD CONSULT YOUR LEGAL, FINANCIAL, TAX OR OTHER PROFESSIONAL ADVISOR(S).

While we make every effort to ensure that any material in this White Paper is accurate and up to date, such material in no way constitutes the provision of professional advice. TTC Foundation does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency, or completeness of any material contained in this White Paper. Participants and potential Token holders should seek appropriate independent professional advice prior to relying on, or entering into any commitment or transaction based on, material published in this White Paper, which material is purely published for reference purposes alone.

The Tokens subject of the Pre-Initial Token Sale and Initial Token Sale are proprietary cryptographic tokens issued and sold by an affiliate ("Issuer") TTC

Foundation. The Token will function as the native universal utility token used in the TTC Protocol as the means of value exchange and to power the TTC Protocol.

The Tokens are not be intended to constitute securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction. This White Paper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product, or a solicitation for any form of regulated investment or investment product in any jurisdiction.

No regulatory authority has examined or approved of any of the information set out in this White Paper. No such action has been or will be taken by TTC Foundation and/or Issuer to obtain such approval under the laws, regulatory requirements or rules of any jurisdiction. The provision of this White Paper to you does not imply that the applicable laws, regulatory requirements or rules have been complied with.

This White Paper does not constitute or form part of any opinion on any advice to purchase, sell or otherwise transact with Tokens and the fact of presentation of this White Paper shall not form the basis of, or be relied upon in connection with, any contract of investment decision.

THE TOKEN SALE (AS REFERRED TO HEREIN) IS INTENDED FOR, MADE TO OR DIRECTED AT ONLY PERSONS OUTSIDE THE UNITED STATES OF AMERICA OR THE PRC AND MAY BE ACTED UPON ONLY BY PERSONS OUTSIDE THE UNITED STATES OF AMERICA OR THE PRC. ACCORDINGLY, YOU ARE NOT ELIGIBLE AND YOU ARE NOT TO PURCHASE ANY TOKENS IN THE TOKEN SALE IF YOU ARE:

(A) A CITIZEN, DOMICILED IN, OR RESIDENT OF THE UNITED STATES OF AMERICA OR THE PRC;

(B) LOCATED IN THE UNITED STATES OF AMERICA OR THE PRC AT THE TIME OF YOUR WHITELISTING FOR AND INTENDED PURCHASE OR PURCHASE OF TOKENS IN THE TOKEN SALE;

(C) LOCATED IN A JURISDICTION WHERE THE TOKEN SALE IS PROHIBITED, RESTRICTED OR UNAUTHORISED IN ANY FORM OR MANNER WHETHER IN FULL OR IN PART UNDER THE LAWS, REGULATORY REQUIREMENTS OR RULES IN SUCH JURISDICTION; OR

(D) A PERSON WHO IS OTHERWISE PROHIBITED OR INELIGIBLE IN ANY WAY, WHETHER IN FULL OR IN PART, FROM PARTICIPATING IN ANY PART OF THE TRANSACTIONS CONTEMPLATED IN THE TOKEN SALE TERMS (AS DEFINED BELOW),

(COLLECTIVELY, "EXCLUDED PERSONS").

For the purpose of this White Paper, to be "Whitelisted" means to be identified to be eligible to participate in the Token Sale by the Issuer subject to satisfactory know your client and anti-money laundering and counter financing of terrorism checks conducted in connection therewith, or such other criteria as may be imposed by the Issuer in connection therewith at its sole and absolute discretion.

No Token should be construed, interpreted, classified or treated as enabling, or according any opportunity to, purchasers to participate in or receive profits, income, or other payments or returns arising from or in connection with the TTC Protocol or the Tokens or the proceeds of the Token Sale, or to receive sums paid out of such profits, income, or other payments or returns.

No person is bound to enter into any contract or binding legal commitment in relation to the sale and purchase of the Tokens, and no cryptocurrency or other form of payment is to be accepted on the basis of this White Paper.

Any agreement as between Issuer and you as a purchaser, and in relation to any sale and purchase, of Tokens is to be governed by only a separate document setting out the terms and conditions (the "Token Sale Terms") of such agreement. In the event of any inconsistencies between the Token Sale Terms and this White Paper, the former shall prevail.

There are risks and uncertainties associated with TTC Foundation, the Issuer and their business and operations, the Tokens, the TTC Protocol, and the Token Sale. Please refer to the section entitled "Risks and Disclosures" set out at the end of this White Paper.

This White Paper, any part thereof and any copy thereof must not be taken or transmitted to any country where distribution or dissemination of this White Paper is prohibited or restricted.

No part of this White Paper is to be reproduced, distributed or disseminated without including this section and the following sections entitled "Disclaimer of

Liability", "No Representations and Warranties", "Representations and Warranties By You", "Cautionary Note On Forward-Looking Statements", "Third Party Information and No Consent of Other Persons", "Terms Used", "No Advice", "No Further Information or Update", "Restrictions On Distribution and Dissemination" and "Risks and Uncertainties".

DISCLAIMER OF LIABILITY

To the maximum extent permitted by the applicable laws, regulations and rules, TTC Foundation and Issuer shall not be liable for any indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection with any acceptance of or reliance on this White Paper or any part thereof by you.

NO REPRESENTATIONS AND WARRANTIES

TTC Foundation and Issuer does not make or purport to make, and hereby disclaims, any representation, warranty or undertaking in any form whatsoever to any entity or person, including any representation, warranty or undertaking in relation to the truth, accuracy and completeness of any of the information set out in this White Paper.

REPRESENTATIONS AND WARRANTIES BY YOU

By accessing and/or accepting possession of any information in this White Paper or such part thereof (as the case may be), you represent and warrant to TTC Foundation as follows:

- (a) you agree and acknowledge that the Tokens do not constitute securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction;
- (b) you are not an Excluded Person, or a citizen or resident of a country the laws of which prohibit or conflict with the Token Sale or your participation in the Token Sale;
- (c) you are not located in a jurisdiction where the Token Sale is prohibited, restricted or unauthorised in any form or manner whether in full or in part under the laws, regulatory requirements or rules in such jurisdiction;

(d) you are not a person who is otherwise prohibited or ineligible in any way, whether in full or in part, from participating in any part of the transactions contemplated in the Token Sale Terms;

(e) you agree and acknowledge that this White Paper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction, or a solicitation for any form of regulated investment or investment product, and you are not bound to enter into any contract or binding legal commitment and no cryptocurrency or other form of payment is to be accepted on the basis of this White Paper;

(f) you acknowledge and understand that no Token should be construed, interpreted, classified or treated as enabling, or according any opportunity to, Token holders to participate in or receive profits, income, or other payments or returns arising from or in connection with the Tokens or the proceeds of the Token Sale, or to receive sums paid out of such profits, income, or other payments or returns;

(g) you agree and acknowledge that no regulatory authority has examined or approved of the information set out in this White Paper, no action has been or will be taken by TTC Foundation to obtain such approval under the laws, regulatory requirements or rules of any jurisdiction and the publication, distribution or dissemination of this White Paper to you does not imply that the applicable laws, regulatory requirements or rules have been complied with;

(h) you agree and acknowledge that this White Paper, the undertaking and/or the completion of the Token Sale, or future trading of Tokens on any cryptocurrency exchange, shall not be construed, interpreted or deemed by you as an indication of the merits of TTC Foundation, the Tokens, the Token Sale, and the TTC Protocol;

(i) the distribution or dissemination of this White Paper, any part thereof or any copy thereof, or acceptance of the same by you, is not prohibited or restricted by the applicable laws, regulations or rules in your jurisdiction, and where any restrictions in relation to possession are applicable, you have observed and complied with all such restrictions at your own expense and without liability to TTC Foundation;

(j) you agree and acknowledge that in the case where you wish to purchase

any Tokens, Tokens are not to be construed, interpreted, classified or treated as:

- (i) any kind of currency other than cryptocurrency;
 - (ii) debentures, stocks or shares issued by any person or entity;
 - (iii) rights, options or derivatives in respect of such debentures, stocks or shares;
 - (iv) rights under a contract for differences or under any other contract the purpose or pretended purpose of which is to secure a profit or avoid a loss;
 - (v) securities;
 - (vi) units or derivatives of units in a business trust;
 - (vii) units in a collective investment scheme; or
 - (viii) any form of regulated investment or investment product;
- (k) you are fully aware of and understand that you are not eligible and you are not to purchase any Tokens if you are an Excluded Person;
- (l) you are legally permitted to participate in the Token Sale and all actions contemplated or associated with such purchase, including the holding and use of Tokens;
- (m) the amounts that you use to purchase Tokens were not and are not directly or indirectly derived from any activities that contravene the laws and regulations of any jurisdiction, including anti-money laundering laws and regulations;
- (n) if you are a natural person, you are of sufficient age and capacity under the applicable laws of the jurisdiction in which you reside and the jurisdiction of which you are a citizen to participate in the Token Sale;
- (o) you are not obtaining or using Tokens for any illegal purpose;
- (p) none of:
- (i) you;

(ii) any person controlling or controlled by you;

(iii) if you are a privately-held entity, any person having a beneficial interest in you; or

(iv) any person for whom you are acting as agent or nominee in connection with this Token Sale,

is a senior foreign political figure, or any immediate family member or close associate of a senior foreign political figure.

A "senior foreign political figure" is defined as a senior official in the executive, legislative, administrative, military or judicial branch of a government (whether elected or not), a senior official of a major political party, or a senior executive of a foreign government-owned corporation, and includes any corporation, business or other entity that has been formed by, or for the benefit of, a senior foreign political figure.

"Immediate family" of a senior foreign political figure typically includes such figure's parents, siblings, spouse, children and in-laws.

A "close associate" of a senior foreign political figure is a person who is widely and publicly known to maintain an unusually close relationship with such senior foreign political figure, and includes a person who is in a position to conduct substantial domestic and international financial transactions on behalf of such senior foreign political figure;

(q) if you are affiliated with a non-U.S. banking institution ("Foreign Bank"), or if you receive deposits from, make payments on behalf of, or handle other financial transactions related to a Foreign Bank, you represent and warrant to TTC Foundation that:

(i) the Foreign Bank has a fixed address, and not solely an electronic address, in a country in which the Foreign Bank is authorised to conduct banking activities;

(ii) the Foreign Bank maintains operating records related to its banking activities;

(iii) the Foreign Bank is subject to inspection by the banking authority that licensed the Foreign Bank to conduct its banking activities; and

(iv) the Foreign Bank does not provide banking services to any other Foreign Bank that does not have a physical presence in any country and that is not a regulated affiliate;

(r) you have a basic degree of understanding of the operation, functionality, usage, storage, transmission mechanisms and other material characteristics of cryptocurrencies, blockchain-based software systems, cryptocurrency wallets or other related token storage mechanisms, blockchain technology and smart contract technology;

(s) you are fully aware and understand that in the case where you wish to purchase any Tokens, there are risks associated with TTC Foundation and its businesses and operations, the Tokens, the TTC Protocol and the Token Sale;

(t) you bear the sole responsibility to determine what tax implications purchasing Tokens may have for you and agree not to hold TTC Foundation or any other person involved in the Token Sale liable for any tax liability associated with or arising therefrom;

(u) you agree and acknowledge that TTC Foundation and/or any person involved in the Token Sale and/or with the creation and distribution of Tokens or the TTC Protocol, is not liable for any direct, indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection with any acceptance of or reliance on this White Paper or any part thereof by you;

(v) you waive the right to participate in a class action lawsuit or a class wide arbitration against TTC Foundation and/or any person involved in the Token Sale and/or with the creation and distribution of Tokens or the TTC Protocol; and

(w) all of the above representations and warranties are true, complete, accurate and non-misleading from the time of your access to and/or acceptance of possession this White Paper or such part thereof (as the case may be).

CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS

All statements contained in this White Paper, statements made in press releases or in any place accessible by the public and oral statements that may be made

by TTC Foundation or its directors, executive officers or employees acting on behalf of TTC Foundation (as the case may be), that are not statements of historical fact, constitute "forward-looking statements". Some of these statements can be identified by forward-looking terms such as "aim", "target", "anticipate", "believe", "could", "estimate", "expect", "if", "intend", "may", "plan", "possible", "probable", "project", "should", "would", "will" or other similar terms. However, these terms are not the exclusive means of identifying forward-looking statements. All statements regarding TTC Foundation's business strategies, plans and prospects and the future prospects of the industry which TTC Foundation is in are forward-looking statements. These forward-looking statements, including but not limited to statements as to TTC Foundation's prospects, future plans, other expected industry trends and other matters discussed in this White Paper regarding TTC Foundation are matters that are not historic facts, but only predictions.

These forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause the actual future results, performance or achievements of TTC Foundation to be materially different from any future results, performance or achievements expected, expressed or implied by such forward-looking statements. These factors include, amongst others:

- (a) changes in political, social, economic and stock or cryptocurrency market conditions, and the regulatory environment in the countries in which TTC Foundation conducts its business and operations;
- (b) the risk that TTC Foundation may be unable to execute or implement its business strategies and future plans;
- (c) changes in interest rates and exchange rates of fiat currencies and cryptocurrencies;
- (d) changes in the anticipated growth strategies and expected internal growth of TTC Foundation and the TTC Protocol;
- (e) changes in the availability and fees payable to TTC Foundation in connection with its businesses and operations or on the TTC Protocol;
- (f) changes in the availability and salaries of employees who are required by TTC Foundation to operate their respective businesses and operations;
- (g) changes in preferences of users of the TTC Protocol;

- (h) changes in competitive conditions under which TTC Foundation operates, and the ability of TTC Foundation to compete under such conditions;
- (i) changes in the future capital needs of TTC Foundation and the availability of financing and capital to fund such needs;
- (j) war or acts of international or domestic terrorism;
- (k) occurrences of catastrophic events, natural disasters and acts of God that affect the businesses and/or operations of TTC Foundation;
- (l) other factors beyond the control of TTC Foundation; and
- (m) any risk and uncertainties associated with TTC Foundation and its business and operations, the Tokens, the TTC Protocol and the Token Sale.

All forward-looking statements made by or attributable to TTC Foundation or persons acting on behalf of TTC Foundation are expressly qualified in their entirety by such factors. Given that risks and uncertainties that may cause the actual future results, performance or achievements of TTC Foundation to be materially different from that expected, expressed or implied by the forward-looking statements in this White Paper, undue reliance must not be placed on these statements. These forward-looking statements are applicable only as of the date of this White Paper.

Neither TTC Foundation nor any other person represents, warrants, and/or undertakes that the actual future results, performance or achievements of TTC Foundation will be as discussed in those forward-looking statements. The actual results, performance or achievements of TTC Foundation may differ materially from those anticipated in these forward-looking statements.

Nothing contained in this White Paper is or may be relied upon as a promise, representation or undertaking as to the future performance or policies of TTC Foundation.

Further, TTC Foundation disclaims any responsibility to update any of those forward-looking statements or publicly announce any revisions to those forward-looking statements to reflect future developments, events or circumstances, even if new information becomes available or other events occur in the future.

THIRD PARTY INFORMATION AND NO CONSENT OF OTHER PERSONS

This White Paper includes information obtained from various third party sources ("Third Party Information"). None of the publishers of the Third Party Information has consented to the inclusion of the Third Party Information in this White Paper and is therefore not liable for the Third Party Information. While TTC Foundation has taken reasonable action to ensure that the Third Party Information have been included in their proper form and context, neither TTC Foundation, nor its directors, executive officers and employees acting on its behalf, has independently verified the accuracy, reliability, completeness of the contents, or ascertained any applicable underlying assumption, of the relevant Third Party Information. Consequently, neither TTC Foundation nor its directors, executive officers and employees acting on their behalf makes any representation or warranty as to the accuracy, reliability or completeness of such information and shall not be obliged to provide any updates on the same.

TERMS USED

To facilitate a better understanding of the Tokens being offered for purchase by TTC Foundation, and the businesses and operations of TTC Foundation, certain technical terms and abbreviations, as well as, in certain instances, their descriptions, have been used in this White Paper. These descriptions and assigned meanings should not be treated as being definitive of their meanings and may not correspond to standard industry meanings or usage.

Words importing the singular shall, where applicable, include the plural and vice versa and words importing the masculine gender shall, where applicable, include the feminine and neuter genders and vice versa. References to persons shall include corporations.

NO ADVICE

No information in this White Paper should be considered to be business, legal, financial or tax advice regarding TTC Foundation, the Tokens, the TTC Protocol, or the Token Sale. You should consult your own legal, financial, tax or other professional advisor regarding TTC Foundation and its business and operations, the Tokens, the TTC Protocol, and the Token Sale. You should be aware that you may be required to bear the financial risk of any exchange for of Tokens for an indefinite period of time.

None of the advisors engaged by us has made or purports to make any statement in this White Paper or any statement upon which a statement in this White Paper is based and each of them makes no representation regarding any state-

ment in this White Paper and to the maximum extent permitted by law, expressly disclaims and takes no responsibility for any liability to any person which is based on, or arises out of, any statement, information or opinions in, or omission from, this White Paper.

NO FURTHER INFORMATION OR UPDATE

No person has been or is authorised to give any information or representation not contained in this White Paper in connection with TTC Foundation and its business and operations, the Tokens, the TTC Protocol, or the Token Sale and, if given, such information or representation must not be relied upon as having been authorised by or on behalf of TTC Foundation. The Token Sale shall not, under any circumstances, constitute a continuing representation or create any suggestion or implication that there has been no change, or development reasonably likely to involve a material change in the affairs, conditions and prospects of TTC Foundation or in any statement of fact or information contained in this White Paper since the date hereof.

RESTRICTIONS ON DISTRIBUTION AND DISSEMINATION

The distribution or dissemination of this White Paper or any part thereof may be prohibited or restricted by the laws, regulatory requirements and rules of any jurisdiction. In the case where any restriction applies, you are to inform yourself about, and to observe, any restrictions which are applicable to your possession of this White Paper or such part thereof (as the case may be) at your own expense and without liability to TTC Foundation.

Persons to whom a copy of this White Paper has been distributed or disseminated, provided access to or who otherwise have the White Paper in their possession shall not circulate it to any other persons, reproduce or otherwise distribute this White Paper or any information contained herein for any purpose whatsoever nor permit or cause the same to occur.

NO OFFER OF INVESTMENT OR REGISTRATION

This White Paper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities of any form, units in a business trust, units in a collective investment scheme or any other form of investment, or a solicitation for any form of investment in any jurisdiction. No person is bound to enter into any contract or binding legal commitment and no cryptocurrency or other form of payment is to be accepted on the basis of this White Paper.

THE TOKEN SALE (AS REFERRED TO HEREIN) IS INTENDED FOR, MADE TO OR DIRECTED AT ONLY PERSONS WHO ARE NOT EXCLUDED PERSONS

No regulatory authority has examined or approved of any of the information set out in this White Paper. No such action has been or will be taken under the laws, regulatory requirements or rules of any jurisdiction. The publication, distribution or dissemination of this White Paper does not imply that the applicable laws, regulatory requirements or rules have been complied with.

RISKS AND UNCERTAINTIES

Prospective purchasers of Tokens should carefully consider and evaluate all risks and uncertainties associated with the Issuer and TTC Foundation, and their business and operations, the Tokens, the TTC Protocol, and the Token Sale, and all information set out in this White Paper and the Token Sale Terms prior to any purchase of the Tokens. If any of such risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of the Issuer could be materially and adversely affected. In such cases, you may lose all or part of the value of the Tokens.

Please read the following risks and warnings before deciding to purchase Tokens. It should be noted the following list of risks and warnings is not exhaustive. Accordingly, prospective purchasers should not place undue reliance on these statements.

1. RISKS RELATING TO PARTICIPATION IN THE TOKEN SALE

The Issuer may be forced to cease operations

It is possible that, due to any number of reasons, including, but not limited to, an unfavourable fluctuation in the value of cryptographic and fiat currencies, the inability of the Issuer to establish the Project or the Token's utility, the failure of commercial relationships, or intellectual property ownership challenges, the Issuer may no longer be viable to operate and the Issuer may dissolve or take actions that result in a dissolution of the Issuer.

There is no prior market for the Tokens and the Token Sale may not result in an active or liquid market for the Tokens

Prior to the Token Sale, there has been no public market for the Tokens. In the event that the Tokens are traded on a cryptocurrency exchange, there is

no assurance that an active or liquid trading market for the Tokens will develop or if developed, be sustained after the Tokens have been made available for trading on such cryptocurrency exchange. There is also no assurance that the market price of the Tokens will not decline below the purchase price of the Tokens (the "Purchase Price"). The Purchase Price may not be indicative of the market price of the Tokens after they have been made available for trading on a cryptocurrency exchange.

A Token is not a currency issued by any central bank or national, supra-national or quasi-national organisation, nor is it backed by any hard assets or other credit. The Issuer is not responsible for nor does it pursue the circulation and trading of Tokens on the market. Trading of Tokens merely depends on the consensus on its value between the relevant market participants, and no one is obliged to purchase any Token from any holder of the Token, including the purchasers, nor does anyone guarantee the liquidity or market price of Tokens to any extent at any time. Accordingly, the Issuer cannot ensure that there will be any demand or market for Tokens, or that the Purchase Price is indicative of the market price of Tokens after they have been made available for trading on a cryptocurrency exchange.

Future sales of the Tokens could materially and adversely affect the market price of Tokens

Any future sale of the Tokens (which were not available for sale in the Token Sale) would increase the supply of Tokens in the market and this may result in a downward price pressure on the Token. The sale or distribution of a significant number of Tokens outside of the Token Sale, or the perception that such further sales or issuance may occur, could adversely affect the trading price of the Tokens.

Negative publicity may materially and adversely affect the price of the Tokens

Negative publicity involving the Issuer, the TTC Protocol, the Tokens or any of the key personnel of the Issuer may materially and adversely affect the market perception or market price of the Tokens, whether or not such negative publicity is justified.

There is no assurance of any success of the TTC Protocol

The value of, and demand for, the Tokens hinges heavily on the performance of the TTC Protocol. There is no assurance that the TTC Protocol will gain

traction after its launch and achieve any commercial success.

The TTC Protocol has not been fully developed, finalised and integrated and is subject to further changes, updates and adjustments prior to its launch. Such changes may result in unexpected and unforeseen effects on its projected appeal to users, and hence impact its success.

While the Issuer has made every effort to provide a realistic estimate, there is also no assurance that the cryptocurrencies raised in the Token Sale will be sufficient for the development and integration of the TTC Protocol. For the foregoing or any other reason, the development and integration of the TTC Protocol may not be completed and there is no assurance that it will be launched at all. As such, distributed Tokens may hold little worth or value, and this would impact its trading price.

If and when the TTC Protocol is fully developed, there is no assurance it will be widely adopted or utilised by its target users.

The trading price of the Tokens may fluctuate following the Token Sale

The prices of cryptographic tokens in general tend to be relatively volatile, and can fluctuate significantly over short periods of time. The demand for, and correspondingly the market price of, the Tokens may fluctuate significantly and rapidly in response to, among others, the following factors, some of which are beyond the control of the Issuer:

- (a) new technical innovations;
- (b) analysts' speculations, recommendations, perceptions or estimates of the Token's market price or the Issuer's financial and business performance;
- (c) changes in market valuations and token prices of entities with operations similar to that of the Issuer that may be made available for sale and purchase on the same cryptocurrency exchanges as the Tokens;
- (d) announcements by the Issuer of significant events, for example partnerships, sponsorships, new product developments;
- (e) fluctuations in market prices and trading volume of cryptocurrencies on cryptocurrency exchanges;

- (f) additions or departures of key personnel of the Issuer;
- (g) success or failure of the Issuer's management in implementing business and growth strategies; and
- (h) changes in conditions affecting the blockchain or financial technology industry, the general economic conditions or market sentiments, or other events or factors.

The funds raised in the Token Sale are exposed to risks of theft

The Issuer will make every effort to ensure that the funds received from the Token Sale will be securely held at such address as directed by the Issuer ("Receiving Address"). Further, upon receipt of the funds, the Issuer will make every effort to ensure that the funds received will be securely held through the implementation of security measures. Notwithstanding such security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and "selfish-mining" attacks), sophisticated cyber-attacks, distributed denials of service or errors, vulnerabilities or defects on the Receiving Address, the TTC blockchain, or any other blockchain, or otherwise. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. In such event, even if the Token Sale is completed, the Issuer may not be able to receive the cryptocurrencies raised and the Issuer may not be able to utilise such funds for the development of the TTC Protocol, and the launch of the TTC Protocol might be temporarily or permanently curtailed. As such, the issued Tokens may hold little worth or value, and this would impact its trading price. The Tokens are uninsured, unless you specifically obtain private insurance to insure them. In the event of any loss or loss of value, you may have no recourse.

2. RISKS RELATING TO THE RECEIVING ADDRESS AND WALLETS

The Receiving Address may be compromised and the cryptocurrencies may not be able to be disbursed

The Receiving Address is designed to be secure. However, in the event that the Receiving Address is, for any reason compromised (including but not limited to scenarios of the loss of keys to such Receiving Address), the funds held by the Receiving Address may not be able to be retrieved and disbursed, and may be permanently unrecoverable. In such event, even if the Token

Sale is successful, the Issuer will not be able to receive the funds raised and the Issuer will not be able to utilise such funds for the development of the TTC Protocol, and the implementation of the TTC Protocol might be temporarily or permanently curtailed. As such, distributed Tokens may hold little worth or value, and this would impact its trading price.

The loss or compromise of information relating to your wallet may affect your access and possession of the Tokens

Your access to the Tokens in a cryptocurrency wallet ("Wallet") depends on, among other things, the safeguards to the information to such Wallet, including but not limited to the user account information, address, private key, and password. In the event that any of the foregoing is lost or compromised, your access to the Wallet may be curtailed and thereby adversely affecting your access and possession to the Tokens, including such Tokens being unrecoverable and permanently lost.

The Wallet or Wallet service provider may not be technically compatible with the Tokens

The Wallet or Wallet service provider may not be technically compatible with the Tokens which may result in the delivery of Tokens being unsuccessful or affect your access to such Tokens.

3. RISKS RELATING TO TTC FOUNDATION

The TTC Protocol is intended to be operated and maintained by TTC Foundation. Any events or circumstances which adversely affect TTC Foundation may have a corresponding adverse effect on the TTC Protocol if such events or circumstances affect TTC Foundation's ability to maintain the TTC Protocol. This would correspondingly have an impact on the trading price of the Tokens.

TTC Foundation may be materially and adversely affected if it fails to effectively manage its operations as its business develops and evolves, which would have a direct impact on its ability to maintain the TTC Protocol and consequently the trading price of the Tokens.

The financial technology and cryptocurrency industries and the markets in which TTC Foundation competes have grown rapidly and continue to grow rapidly and evolve in response to new technological advances, changing business models and other factors. As a result of this constantly changing envi-

ronment, TTC Foundation may face operational difficulties in adjusting to the changes, and the sustainability of TTC Foundation will depend on its ability to manage its operations, adapt to technological advances and market trends and ensure that it hires qualified and competent employees, and provide proper training for its personnel.

As its business evolves, TTC Foundation must also expand and adapt its operational infrastructure. TTC Foundation's business relies on its blockchain-based software systems, cryptocurrency wallets or other related token storage mechanisms, blockchain technology and smart contract technology, and to manage technical support infrastructure for the TTC Protocol effectively, TTC Foundation will need to continue to upgrade and improve its data systems and other operational systems, procedures and controls. These upgrades and improvements will require a dedication of resources, are likely to be complex and increasingly rely on hosted computer services from third parties that TTC Foundation does not control. If TTC Foundation is unable to adapt its systems and organisation in a timely, efficient and cost-effective manner to accommodate changing circumstances, its business, financial condition and results of operations may be adversely affected. If the third parties whom TTC Foundation relies on are subject to a security breach or otherwise suffer disruptions that impact the services TTC Foundation utilises, the integrity and availability of its internal information could be compromised, which may consequently cause the loss of confidential or proprietary information, and economic loss.

The loss of financial, labour or other resources, and any other adverse effect on TTC Foundation's business, financial condition and operations, would have a direct adverse effect on TTC Foundation's ability to maintain the TTC Protocol. As the TTC Protocol is the main product to which the Tokens relate, this may adversely impact the trading price of the Tokens.

There may be weaknesses, vulnerabilities or bugs in the TTC smart contract

TTC Foundation will make reasonable efforts to ensure that the smart contracts underlying the Tokens are audited, tested and approved by technical experts. However, as smart contract technology is still in its early stage of development and its application of experimental nature carries significant operation, technological, financial, regulatory and reputational risks, there are inherent risks that such smart contracts could contain weaknesses, vulnerabilities or bugs.

Purchasers of Tokens should understand and accept that there are no warran-

ties that Tokens are fit for a particular purpose or do not contain any weaknesses, vulnerabilities or bugs which would cause loss in their worth or value. In the event that any of the aforementioned risks materialises, TTC Foundation's business strategies, results of operations and prospects may also be adversely affected.

TTC Foundation may experience system failures, unplanned interruptions in its network or services, hardware or software defects, security breaches or other causes that could adversely affect TTC Foundation's infrastructure network, and/or the TTC Protocol

TTC Foundation is unable to anticipate when there would be occurrences of hacks, cyber-attacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and "selfish-mining" attacks), distributed denials of service or errors, vulnerabilities or defects in the TTC Protocol, the Tokens, the Receiving Address, the Wallet or any technology (including but not limited to smart contract technology) on which TTC Foundation, the TTC Protocol, the Tokens, the Receiving Address, and the Wallet relies or on the TTC blockchain or any other blockchain. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. TTC Foundation may not be able to detect such hacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and "selfish-mining" attacks), cyber-attacks, distributed denials of service errors vulnerabilities or defects in a timely manner, and may not have sufficient resources to efficiently cope with multiple service incidents happening simultaneously or in rapid succession.

TTC Foundation's network or services, which would include the TTC Protocol, could be disrupted by numerous events, including natural disasters, equipment breakdown, network connectivity downtime, power losses, or even intentional disruptions of its services, such as disruptions caused by software viruses or attacks by unauthorised users, some of which are beyond TTC Foundation's control. Although TTC Foundation has taken steps against malicious attacks on its appliances or its infrastructure, which are critical for the maintenance of the TTC Protocol and its other services, there can be no assurance that cyber-attacks, such as distributed denials of service, will not be attempted in the future, and that any of TTC Foundation's enhanced security measures will be effective. TTC Foundation may be prone to attacks on its infrastructure intended to steal information about its technology, financial data or user information or take other actions that would be damaging to TTC Foundation and users of the TTC Protocol. Any significant breach of TTC Foundation's security measures or other disruptions resulting in a compromise of

the usability, stability and security of TTC Foundation's network or services (including the TTC Protocol) may adversely affect the trading price of the Tokens.

We are dependent in part on the location and data centre facilities of third parties

TTC Foundation's infrastructure network is in part established through servers that which it owns and houses at the location facilities of third parties, and servers that it rents at data centre facilities of third parties. If TTC Foundation is unable to renew its data facility lease on commercially reasonable terms or at all, TTC Foundation may be required to transfer its servers to a new data centre facility, and may incur significant costs and possible service interruption in connection with the relocation. These facilities are also vulnerable to damage or interruption from, among others, natural disasters, arson, terrorist attacks, power losses, and telecommunication failures. Additionally, the third party providers of such facilities may suffer a breach of security as a result of third party action, employee error, malfeasance or otherwise, and a third party may obtain unauthorised access to the data in such servers. As techniques used to obtain unauthorised access to, or to sabotage systems change frequently and generally are not recognised until launched against a target, TTC Foundation and the providers of such facilities may be unable to anticipate these techniques or to implement adequate preventive measures. Any such security breaches or damages which occur which impact upon TTC Foundation's infrastructure network and/or the TTC Protocol may adversely impact the price of the Tokens.

General global market and economic conditions may have an adverse impact on TTC Foundation's operating performance, results of operations and cash flows

TTC Foundation has been and could continue to be affected by general global economic and market conditions. Challenging economic conditions worldwide have from time to time, contributed, and may continue to contribute, to slow-downs in the information technology industry at large. Weakness in the economy could have a negative effect on TTC Foundation's business, operations and financial condition, including decreases in revenue and operating cash flows. Additionally, in a down-cycle economic environment, TTC Foundation may experience the negative effects of increased competitive pricing pressure and a slowdown in commerce and usage of the TTC Protocol. Suppliers on which TTC Foundation relies for servers, bandwidth, location and other services could also be negatively impacted by economic conditions that, in

turn, could have a negative impact on TTC Foundation's operations or expenses. There can be no assurance, therefore, that current economic conditions or worsening economic conditions or a prolonged or recurring recession will not have a significant adverse impact on TTC Foundation's business, financial condition and results of operations and hence the TTC Protocol, which would correspondingly impact the trading price of the Tokens.

TTC Foundation or the Tokens may be affected by newly implemented regulations

Cryptocurrency trading is generally unregulated worldwide, but numerous regulatory authorities across jurisdictions have been outspoken about considering the implementation of regulatory regimes which govern cryptocurrency or cryptocurrency markets. TTC Foundation or the Tokens may be affected by newly implemented regulations relating to cryptocurrencies or cryptocurrency markets, including having to take measures to comply with such regulations, or having to deal with queries, notices, requests or enforcement actions by regulatory authorities, which may come at a substantial cost and may also require substantial modifications to the TTC Protocol. This may impact the appeal of the TTC Protocol for users and result in decreased usage of the TTC Protocol. Further, should the costs (financial or otherwise) of complying with such newly implemented regulations exceed a certain threshold, maintaining the TTC Protocol may no longer be commercially viable and TTC Foundation may opt to discontinue the TTC Protocol and/or the Tokens. Further, it is difficult to predict how or whether governments or regulatory authorities may implement any changes to laws and regulations affecting distributed ledger technology and its applications, including the TTC Protocol and the Tokens. TTC Foundation may also have to cease operations in a jurisdiction that makes it illegal to operate in such jurisdiction, or make it commercially unviable or undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction. In scenarios such as the foregoing, the trading price of Tokens will be adversely affected or Tokens may cease to be traded.

The regulatory regime governing blockchain technologies, cryptocurrencies, tokens, and token offerings such as the Token Sale, the TTC Protocol, and the Tokens is uncertain, and regulations or policies may materially adversely affect the development of the TTC Protocol and the utility of the Tokens

Regulation of tokens (including the Tokens) and token offerings such as the Token Sale, cryptocurrencies, blockchain technologies, and cryptocurrency exchanges currently is undeveloped and likely to rapidly evolve, vary signifi-

cantly among international, federal, state and local jurisdictions, and is subject to significant uncertainty. Various legislative and executive bodies in Singapore and other countries may in the future, adopt laws, regulations, guidance, or other actions, which may severely impact the development and growth of the TTC Protocol and the adoption and utility of the Tokens. Failure by TTC Foundation or users of the TTC Protocol to comply with any laws, rules and regulations, some of which may not exist yet or are subject to interpretation and may be subject to change, could result in a variety of adverse consequences, including civil penalties and fines.

Blockchain networks also face an uncertain regulatory landscape in many foreign jurisdictions such as the European Union, the PRC, South Korea, and Russia. Various foreign jurisdictions may, in the near future, adopt laws, regulations or directives that affect the TTC Protocol. Such laws, regulations or directives may directly and negatively impact TTC Foundation's business. The effect of any future regulatory change is impossible to predict, but such change could be substantial and materially adverse to the development and growth of the TTC Protocol and the adoption and utility of the Tokens.

New or changing laws and regulations or interpretations of existing laws and regulations may materially and adversely impact the value of the currency in which the Tokens may be sold, the value of the distributions that may be made by TTC Foundation, the liquidity of the Tokens, the ability to access marketplaces or exchanges on which to trade the Tokens, and the structure, rights and transferability of Tokens.

Tokens holders will have no control on TTC Foundation

The holders of Tokens are not and will not be entitled, to vote or receive dividends or be deemed the holder of capital stock of the issuer for any purpose, nor will anything be construed to confer on the purchaser any of the rights of a stockholder of TTC Foundation or any right to vote for the election of directors or upon any matter submitted to stockholders at any meeting thereof, or to give or withhold consent to any corporate action or to receive notice of meetings, or to receive subscription rights or otherwise.

The purchaser may lack information for monitoring their investment

The purchaser may not be able to obtain all information it would want regarding TTC Foundation, the Tokens, or the TTC Protocol, on a timely basis or at all. It is possible that the purchaser may not be aware on a timely basis of material adverse changes that have occurred. Information in relation to the

development of Tokens may also be highly technical by nature. As a result of these difficulties, as well as other uncertainties, the purchaser may not have accurate or accessible information about the TTC Protocol.

There may be risks relating to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions widespread communicable diseases and other force majeure events beyond the control of TTC Foundation

The Token Sale and the performance of TTC Foundation's activities may be interrupted, suspended or delayed due to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions, widespread communicable diseases and other force majeure events beyond the control of TTC Foundation. Such events could also lead to uncertainty in the economic outlook of global markets and there is no assurance that such markets will not be affected, or that recovery from the global financial crisis would continue. In such events, TTC Foundation's business strategies, results of operations and prospects may be materially and adversely affected. Further, if an outbreak of such infectious or communicable diseases occurs in any of the countries in which TTC Foundation, the developers, data providers or data consumers have operations in the future, market sentiment could be adversely affected and this may have a negative impact on the TTC Protocol and community.

There may be unanticipated risks arising from the Tokens

Cryptographic tokens such as the Tokens are a relatively new and dynamic technology. In addition to the risks included in this Annex, there are other risks associated with your purchase, holding and use of the Tokens, including those that TTC Foundation cannot anticipate. Such risks may further materialise as unanticipated variations or combinations of the risks discussed hereto.