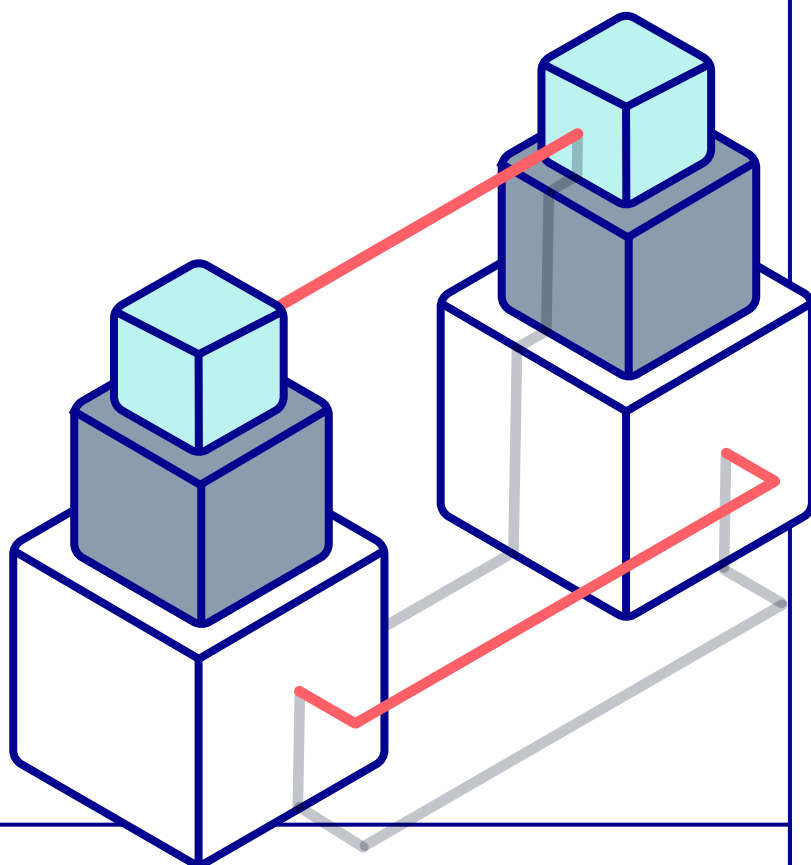




TTC協議：

基于去中心化和代幣激勵的 社交網絡



v0.9

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摘要

傳統移動社交網絡服務通過中心化的結構給用戶提供價值，用戶通過觀看平臺廣告給平臺提供商業價值。

TTC是基于去中心化和代幣激勵的新一代社交網絡協議，在社交網絡中心化趨勢愈發明顯的今天，我們希望給用戶創造一種個人價值感更強、活動更有趣的全新的社交體驗。

通過區塊鏈技術和代幣激勵的思想，讓廣大社交用戶在傳統的人與內容、人與人的互動中，獲得全新形式的代幣獎勵，並隨着對其他用戶的貢獻獲取更大的回報，將社交平臺產生的收益返還給價值真正的創造者——用戶，進而產生巨大的網絡效應和商業影響力。

在全新的代幣機制下，早期的激勵手段和良好的產品氛圍有助于快速建立起用戶口碑和產品品牌，形成網絡效應後，用戶的成長和平臺價值的擴大將變得水到渠成。

tataUFO是基于年輕人社交網絡的個性化生活分享平臺，目前有超過10,000,000注冊用戶。tataUFO將作為TTC開放平臺上第一個DAPP，旨在利用區塊鏈技術和代幣激勵機制突破現有社交網絡的瓶頸，為廣大用戶帶來更大的社交價值。

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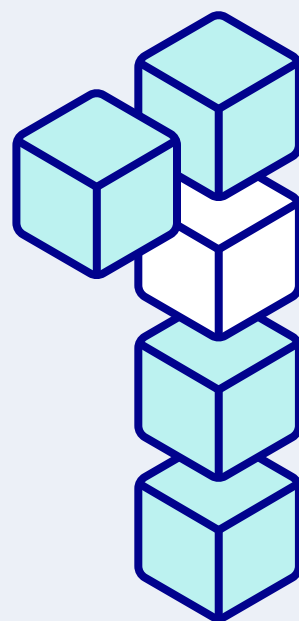
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White Paper Disclaimer

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背景



社交網絡 對去中心化的訴求

隨着移動通信的發展，越來越多的用戶有機會向世界展示自己的生活動態，第一時間獲取好友甚至陌生人的動態，并隨時產生互動，建立并維系相互之間的社交關系。各種基于社交網絡的移動應用快速地崛起，像 Facebook、Instagram、微博、知乎，都成為了用戶發布生活動態、表達態度、建立社交聯系的平臺。

在社交網絡日益成熟完善的今天，用戶却越來越感受到了社交平臺的限制。由于平臺的高度中心化，平臺流量被少數頭部用戶所控制，普通用戶參能夠獲得的關注和收益越來越少，這也導致用戶創作產生內容的動力越來越弱。另一方面，由于網絡化效應而產生的廣告收益被平臺所獲得，廣大的平臺參與者的個體價值難以體現。

如今，中心化的社交平臺模式限制了社交參與者的熱情，也不符合互聯網平等開放的精神，社交用戶正期待着更加開放公平、更强激勵的去中心化社交網絡。

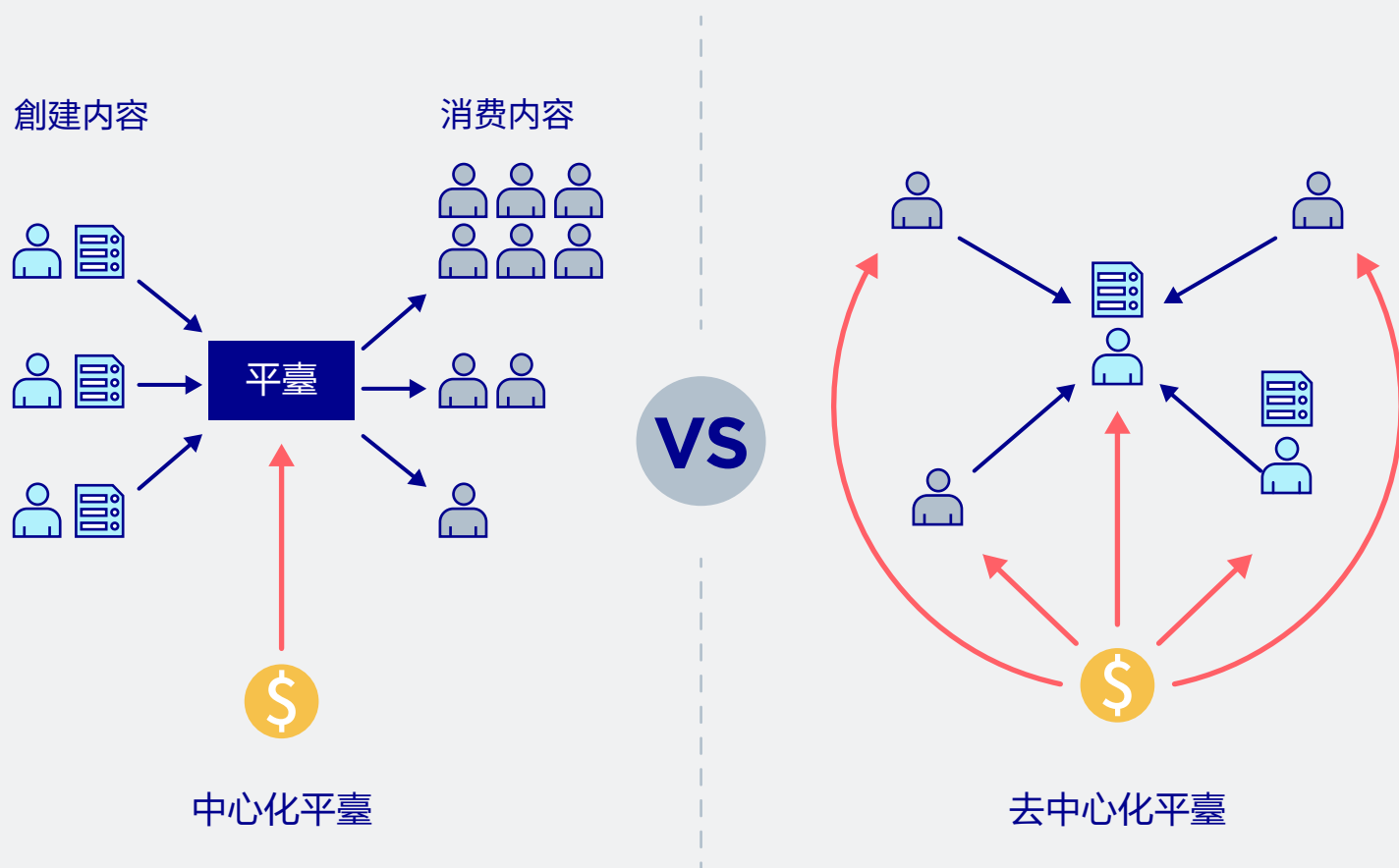


圖1. 中心化平臺和去中心化平臺的對比。可以看到，中心化平臺掌握着內容分發權，並且獲得全部廣告收益；在去中心化平臺中，看到的內容有用戶決定，廣告推廣收益流向了所有參與用戶

區塊鏈技術

區塊鏈技術是一種去中心化的公共賬本和共識算法，通過加密算法和智能合約保證社區內的全部用戶共享和維護交易信息，確保在去中心化的情況下，系統內部信息真實透明，不可篡改和偽造，使得系統網絡具有長期穩定的價值。

近年來，區塊鏈技術得到了快速穩定的發展，在文件存儲、網絡安全、資產交易、銀行結算、金融、醫療、供應鏈等諸多領域都取得了長足進展，已經開始滲入到廣大用戶的日常生活中。

據統計，2017年全球進行ICO的區塊鏈項目就達到了600餘個，2018年第一個月，確定將要進行ICO的項目已經超過了200個。截至目前，全球已經出現了近6000家數字貨幣交易所。

區塊鏈技術 與社交網絡

社交網絡的出現為廣大用戶提供了低成本參與的社交平臺，平臺內的用戶作為社交網絡中的節點，聚集度較高，通過社交分享機制進入門檻低，具有快速擴散、快速聚集的特性，很容易形成網絡效應。社交網絡這樣的特性和區塊鏈去中心化的理念一致性很高，是區塊鏈技術極佳的應用場景。

隨着區塊鏈技術的發展，基于區塊鏈技術的內容社區開始涌入人們的視線，如國外的內容社區平臺steemit.com利用區塊鏈技術解決優質文章內容的篩選和激勵，以挑選出對用戶有價值的優質原創文章。但出于文章內容的專業性，普通用戶難于參與其中，最終受到獎勵的祇是少部分明星用戶，反而偏離了去中心化的初衷。

目前，基于區塊鏈的社交網絡的嘗試中，更多是基于通信技術和解決方案的角度，還沒有基于社交內容和行為獎勵的嘗試，但社交平臺通過區塊鏈技術進行去中心化已是大勢所趨。

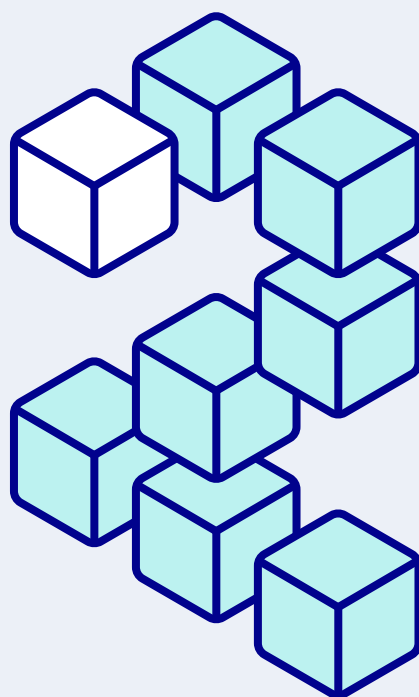
社交網絡中的 代幣激勵

在區塊鏈技術的基礎上，在社交網絡中發行基礎代幣，通過強大而靈活的代幣政策，激勵用戶的正向行為，會為產品帶來諸多價值：

- **更活躍的用戶。**每個用戶都是平臺的股東，每個用戶對平臺的貢獻都能被清晰地識別，並獲得公平的獎勵，用戶將更積極付出為平臺做出積極的貢獻。
- **健康的氛圍。**符合產品價值觀的內容會獲得更多獎勵，高質量內容的產生，有助於形成良好的產品氛圍和產品調性。
- **指數級規模增長。**早期激勵和良好的產品氛圍有助於快速建立起用戶口碑和產品品牌，形成網絡效應後，後續的用戶增長將水到渠成。

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TTC代幣



TTC代幣

TTC是基于區塊鏈技術的通用代幣，作為產品上智能合約和交易行為的運作媒介。相比于傳統的挖礦獲取代幣的機制，TTC的發放更加看重用戶行為對產品的貢獻，用戶可以創建自己的生活動態，或者發掘其他用戶的動態以獲取獎勵。這種方式讓用戶的社交行為更有價值，有助於形成長期穩定的個人形象和風格，更大程度激勵用戶貢獻并獲取價值。

同時，第三方可以借助平臺進行推廣，與傳統社交平臺不同的是，推廣的收益將以TTC的方式直接分配給選擇參與的用戶，讓用戶得到更多公平的獎勵。

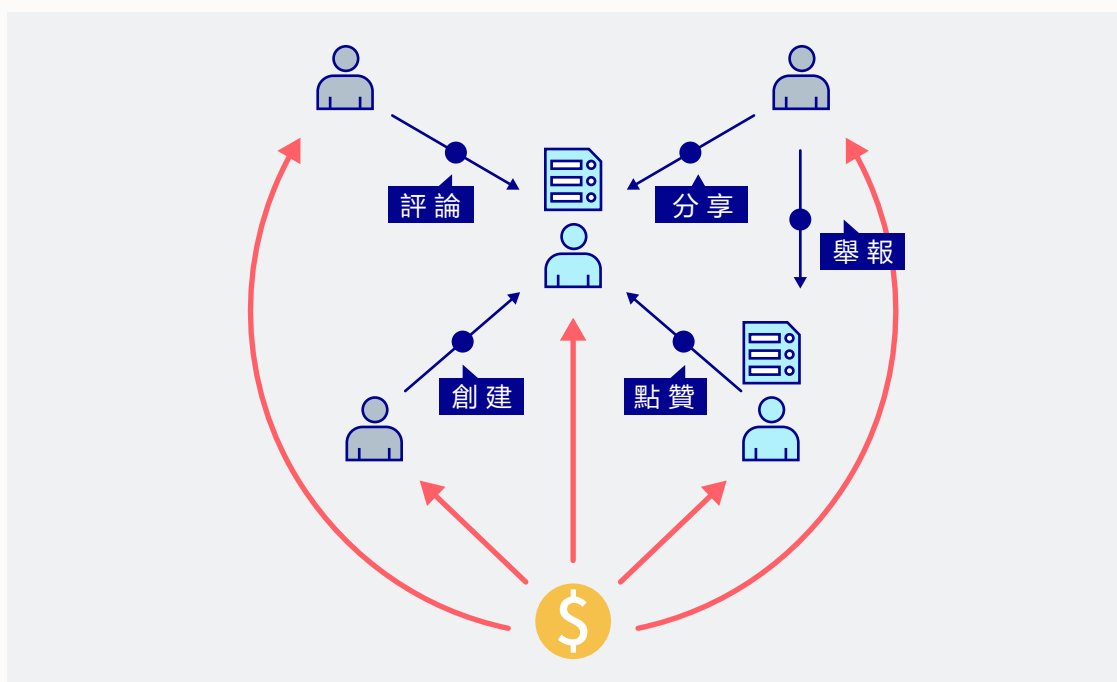


圖2. 用戶通過創建分發動態內容，并和其他內容互動來獲取TTC獎勵

tataUFO將是TTC體系中的初創成員，前期產品將依托于現有用戶，隨着產品機制的完善和影響力的擴大，越來越多的用戶體會到去中心化的社交平臺的價值，產品將逐步擴展到其他國家，為全球更多用戶提供更優質的社交服務。

內容產品對比

	tataUFO	Steemit	Weibo	instagram
產品定位	個性化生活分享平臺	原創個人博客	社會化媒體	圖片社交平臺
內容形式	個人動態	專業文章	綜合資訊	個人動態
區塊鏈技術	是	是	否	否
內容管理	用戶	用戶	平臺	平臺
內容分發	去中心化	高度中心化	中心化	中心化
內容審查監督	大部分用戶	少量明星用戶	平臺	平臺
用戶獲取內容獎勵	是	是	少量明星用戶	無
推廣收益方	用戶	無	平臺	平臺

表1. tataUFO、Steemit、微博、Instagram產品各角度對比，可以看到，tataUFO在底層機制和內容分發上都以去中心化作為目標，真正讓廣大普通用戶能够在產品中獲得更多社交價值

經濟體系

TTC作為產品的通用代幣，根據用戶的貢獻程度分配給平臺用戶，目前用戶可以通過三種方式獲取TTC獎勵：

- **內容獎勵。**用戶通過創建生活動態向其他用戶提供優質內容，內容優質與否放由產品內其他用戶共同決定，用戶通過對內容進行點贊、評論、分享、舉報等互動操作表達對一個動態內容的態度。
- **聲望獎勵。**聲望是爲了激勵長期爲產品帶來價值的用戶而設計的體系，隨着用戶表現出對產品的忠誠度，不斷創造優質內容，并被其他用戶認可，其個人聲望將不斷提高。高聲望的用戶是產品理念的忠實擁護者，將持續獲得聲望帶來的獎勵。
- **推廣獎勵。**推廣獎勵由第三方提供，通過專題活動、品牌展示、用戶調研等方式，邀請用戶參與其中，爲用戶帶來額外的獎勵。

按照智能合約中的設定，包括內容獎勵和聲望獎勵來自于發行獎勵池，每天發行的數量是固定的，第三方推廣的獎勵來自于在平臺上進行推廣的廣告商。

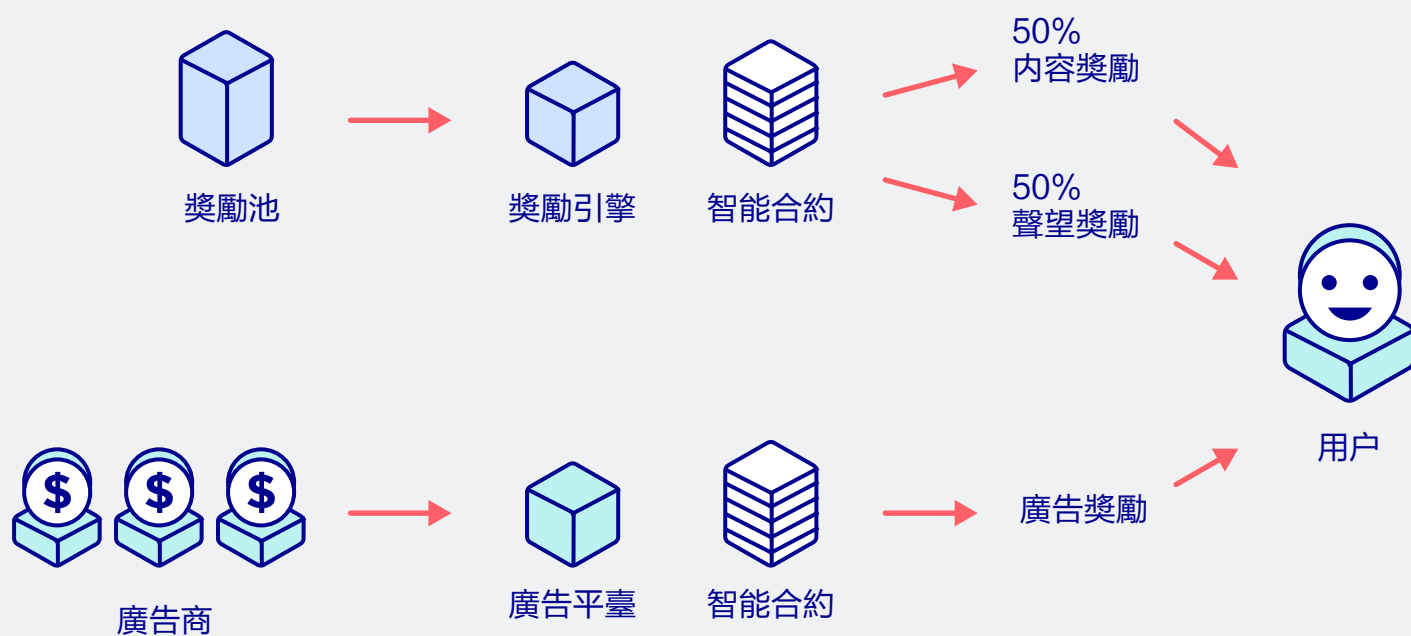


圖3. 當日發行獎勵池和推廣獎勵池示意

內容獎勵

內容價值由與該內容互動的用戶聲望決定，當用戶對一個動態內容進行點贊、評論、分享、舉報操作時，該用戶的聲望會增加到該內容價值中。聲望決定了用戶對產品理念的接受程度，高聲望用戶對內容的挖掘和互動將為該內容提供較高的價值提升和曝光機會。

如果一條動態內容被分享到第三方平臺，該內容的H5頁面的曝光量也會計算到該內容的分享價值中。

$$\begin{aligned} \text{內容價值} &= \Upsilon \text{點贊權重} * \sum f(\text{點贊者聲望}) + \Upsilon \text{評論權重} * \sum f(\text{評論者聲望}) \\ &+ \Upsilon \text{分享權重} * \sum f(\text{分享者聲望}) - \sum f(\text{舉報者聲望}) \\ &(\text{三種權重的初始比例為，點贊權重 : 評論權重 : 分享權重} = 30\% : 50\% : 20\%) \end{aligned}$$

當用戶進行了點贊、評論、分享中的多種操作時，祇保留其中價值最高的操作為內容貢獻價值，不過每多做一種操作，貢獻的聲望值額外加1。例如，一個聲望為12的用戶對一條動態進行了點贊、評論、分享3種操作，則該用戶貢獻的內容價值為14。

如果有不符合產品理念的動態出現，用戶可以對其進行舉報操作，動態

內容價值將會扣減掉被舉報用戶的聲望值，被舉報用戶的其他操作將不再計算分數。爲了確保舉報行爲的公平性和公正性，將會有用戶的審核委員會機制，以確保該項權利不被濫用。

內容價值決定了該內容的曝光機會，也決定了其在當天能分配到的內容獎勵，內容價值將按照比例分配給內容創建者和參與互動者。

聲望獎勵

聲望反映了一個用戶在產品中的長期貢獻，用戶持續關注產品，創建大量優質動態內容，被其他用戶認可，是反應用戶長期貢獻的要素，同時產品內會有對舉報動態的審核工作，也是用戶做出貢獻的方式。

聲望 = 登陸價值 + 創建內容價值 + 關注者價值 + 舉報審核價值
 （四種價值權重的初始比例為，登陸：創建內容：關注者：舉報
 審核 = 20：30：30：20）

用戶聲望的初始值為1，上限為100。四種價值的獲取均服從冪函數分布，即聲望增加的速度開始較快，後續逐漸減緩。

- **登陸價值** 反映了用戶對產品的忠誠度，與用戶登陸產品天數有關，隨着登錄天數的增加，後續登陸獲得登陸價值的趨勢逐漸減緩，最後登陸價值趨近于20。

$$V_{\text{登陸}} = \log(n, Nd)$$

- **創建內容價值** 反映了用戶在優質動態上的貢獻，與用戶創建動態內容數量和內容價值有關，隨着創建內容的增多，對創建內容價值增加的趨勢逐漸減緩，最後創建內容價值趨近于30。

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

- **關注者價值** 反映了用戶被其他用戶認可程度，與用戶關注者數量和關注者聲望有關，隨着關注者數量增多，對關注者價值增加的趨勢逐漸減緩，最後關注者價值趨近于30。

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

- **舉報審核價值** 反映了用戶在維護產品環境上的貢獻，與用戶有效舉報次數和正向審核次數有關。用戶所進行的舉報將通過由平臺內其他用戶進行審核，如果一半以上參與審核成員認定該舉報有效，則舉報者會增加一定的聲望值，否則舉報者會扣除一定的聲望值，支持這一結果的參與審核用戶也會增加聲望值。隨着舉報和審核數量的增多，對舉報審核價值增加的趨勢逐漸減緩，最後舉報審核價值趨近于20。

$$V_{\text{舉報審核}} = \log (n, f (Nr, \text{audit(成功/失敗)}))$$

推廣獎勵

平臺為用戶提供了通過參加第三方推廣活動額外獲得TTC的機制，第三方通過其他渠道獲得TTC，參與每天的推廣資源競價，競價成功可以在產品中選擇合適的推廣方式進行推廣。當前的推廣方式包括專題活動、廣告露出、用戶調研等，後續將會陸續有形式更豐富的推廣方式。第三方推廣所支付的TTC將會直接分配給參與推廣活動的用戶，平臺開發者會從中獲取一定額度TTC作為平臺維護費用。

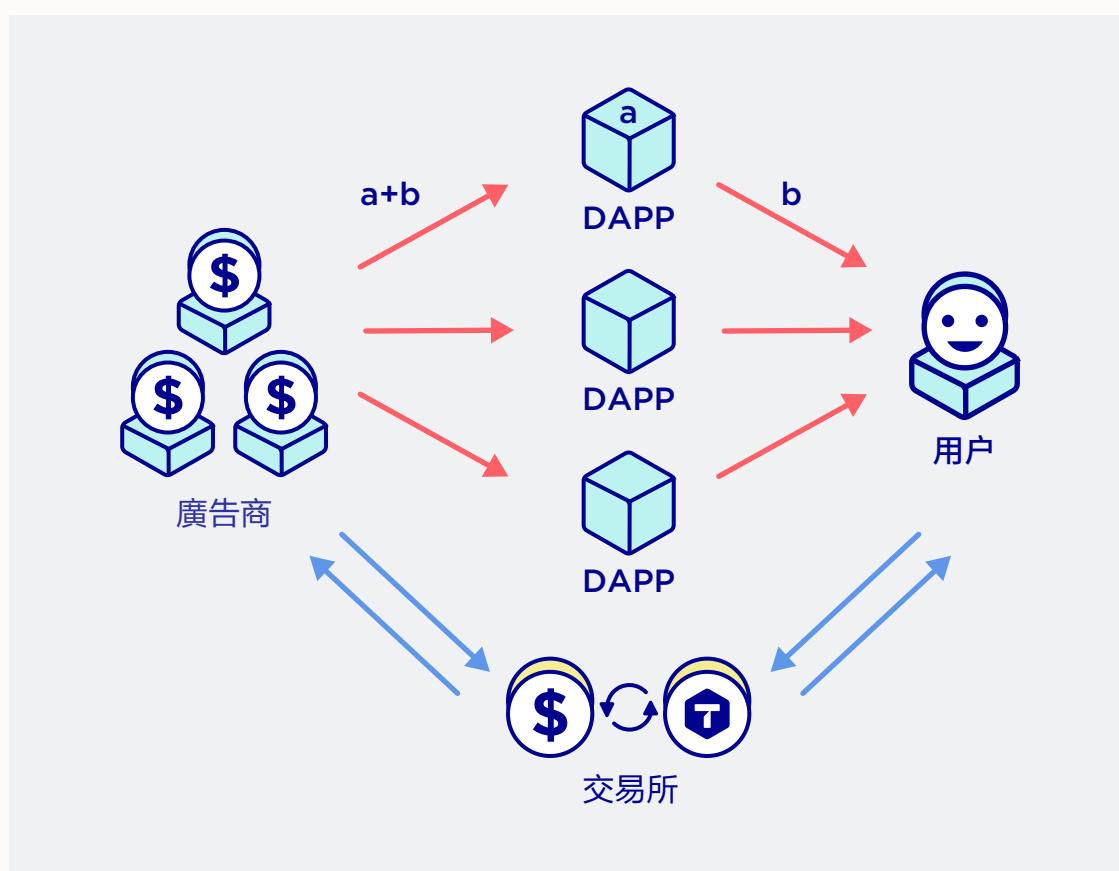


圖4. 用戶通過創建分發動態內容，并和其他內容互動來獲取TTC獎勵

- 專題活動

第三方在產品指定推廣位置開啓專題活動，用戶可在該專題下創建內容，根據內容互動情況，按照一定規則將活動獎勵按比例分配給參與專題活動的用戶。



- 廣告露出

第三方選擇某部分產品用戶投放廣告，按照展示、點擊、行為等多種方式衡量廣告效果，用戶可以選擇是否希望看到廣告，廣告投放的費用根據實際效果分配給觀看廣告的用戶。



- 用戶調研

第三方選擇某部分產品用戶投放調查問卷，按照回收情況衡量投放問卷效果，用戶可以是否參與調研，問卷投放的費用根據實際效果分配給參與調研的用戶。



獎勵機制

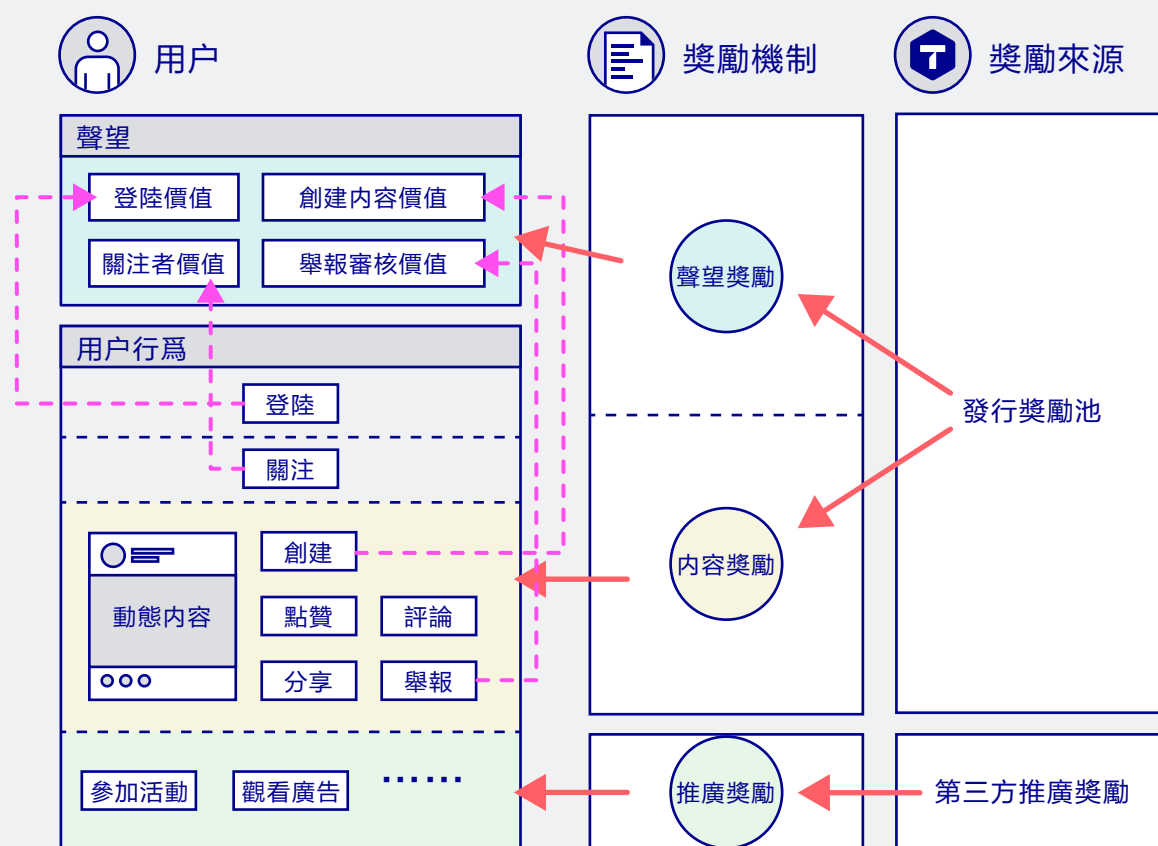


圖5. 用戶行為及獎勵的價值鏈條。用戶在產品中進行創建動態并和其他動態互動，以分得每日內容獎勵；而隨着用戶不斷使用產品，登陸、關注、創建、舉報、審核等功能會從不同維度提升用戶的聲望，進而為用戶帶來聲望獎勵；通過參加第三方推廣活動，用戶可以獲得第三方投放提供的推廣獎勵

產品在每天24:00（格林威治時間）結算當天發放的獎勵，獎勵在發行獎勵池和推廣獎勵池中進行分配。發行獎勵池是根據發放原則制定的，每天發放的數量從一開始就固定下來，每日固定的發行獎勵包括短期的

內容獎勵和長期的聲望獎勵，初始設定兩者所占的比重為1:1。推廣獎勵池由第三方提供，根據實際第三方參與情況確定。

- **內容獎勵**

- 內容獎勵分配給用戶每天產生的動態內容，取決於每個動態所產生的內容價值。
- 用戶創建的動態內容自創建時間開始計算價值，至24小時計算截止。每個內容的價值計算周期都會經歷完整的24小時，會參與一次且僅有一次的獎勵分配，該內容將會在計算截止當天的24:00參與獎勵分配。內容價值計算截止後的互動操作將不會對該內容價值產生影響。
- 每個內容的價值按一定比例分配給創建者和互動者，初始設定為黃金分割比例，及創建者分得61.8%，互動者分得38.2%。
- 互動者之間，根據先後順序按一定比例進行分配，初始設定為斐波那契數列比例。例如有5個用戶參與，第一個到第五個用戶分別分得8/19, 5/19, 3/19, 2/19, 1/19。

- **聲望獎勵**。聲望獎勵分配給參與產品的每一個用戶，根據用戶前一天的聲望值按比例分配。高聲望用戶對產品做出了長期貢獻，可以長期獲得獎勵，類似於股權分紅的概念。

- **推廣獎勵**。每天參與推廣活動的用戶將獲得額外的推廣獎勵，數量由第三方投放情況決定，按規則獎勵給參與推廣活動的用戶。

露出機制

產品內有較多的動態露出機制，保證每個用戶都能看到多種不同的動態。用戶感興趣的內容會優先露出，同時也會把產品內其他用戶選出的高價值內容優先讓用戶看到，此外產品鼓勵用戶根據自己的興趣專長，挖掘質量高的內容并展示給與自己相關的用戶。

- **我的關注**。在“我的關注”模塊，用戶可以看到自己關注的用戶創建的內容，同時關注的用戶進行過點贊、評論操作的內容也會出現。該模塊下的內容將根據創建者聲望、互動者聲望及時間維度進行綜合排序。
- **近期熱門**。在“近期熱門”模塊，用戶可以看到最近一段時間產生的內容價值最高的內容，每1分鐘更新一次價值分數排序。該模塊下的內容將根據互動者聲望及時間維度進行綜合排序。
- **發現**。在“發現”模塊，用戶可以看到產品內的全部動態內容，內容將通過聚合產生標籤，通過不同的標籤，用戶可以更好選擇自己感興趣和專業的領域，進而憑借自己的慧眼挖掘出有價值的內容。該模塊的內容按照時間排序，用戶可以獲取關注過的標籤下的最新內容。

平臺環境

在一個去中心化的平臺上，存在少數用戶濫用產品規則，獲取不公平獎勵的情況，對產品生態環境和長期價值有較大影響。通過合理的產品機制，以及用戶之間的相互監督，確保不符合產品理念的內容及行為受到懲罰，並最小化其對其他用戶造成的影響。

- **系統識別。**通過系統算法識別出預先設定的有規律的惡意產品行為，如多次無意義評論，該行為的結果將被靜默處理，該用戶將沒有權利分得任何獎勵。
- **舉報機制。**用戶可以對平臺內展示的動態內容進行舉報，內容被舉報的次數超過一定值後，內容的價值及露出的幾率降大幅下降，由於內容價值低，該內容的創建者將很難分得相應的內容獎勵和聲望獎勵
- **審核機制。**當某個動態被舉報次數較多時，達到一定聲望值的用戶將可以看到被舉報內容並參與舉報審核。如果一半以上參與審核的用戶認定該舉報有效，該內容將不再公開展示，發布者會被扣除一定的聲望值，舉報者和支持這一結果的參與審核用戶均會增加一定的聲望值。如果一半以上參與審核的用戶認定該舉報無效，則發布內容不受影響，舉報者會被扣除一定的聲望值。

應用場景

TTC作為平臺通用貨幣，有不同的使用場景幫助用戶獲得更好的產品體驗。第三方開發者可以充分利用平臺開發有價值的服務，用戶通過支付TTC獲取這些服務。以tataUFO為例，用戶可以通過消費TTC獲得以下特權：

- 表情包

用戶可以通過TTC購買第三方愛好者制作的表情包，在用戶日常交流過程中使用，以獲得更好的社交體驗，用戶花費的TTC將分給表情包制作者。



- 聊天機器人

聊天機器人能讓用戶更快速方便地獲取信息和服務，如天氣預報、當前匯率等，用戶可以支付TTC給開發者以訂閱相應的聊天機器人服務。



- **發起投票**

當用戶需要其他用戶的意見時，可以通過支付一定數量的TTC發起一個投票，其他用戶可參與投票給該用戶意見反饋，並且按比例獲得發起投票用戶支付的TTC。

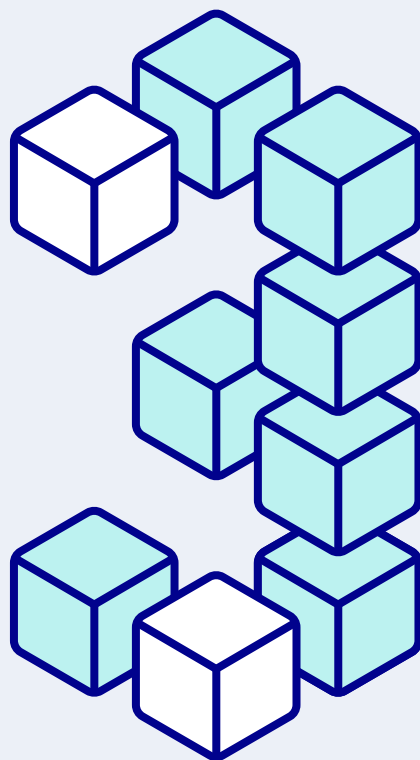


- **發私信**。在產品中，祇有互相關注的用戶才可以聊天，用戶可以在雙方尚未成為好友前，通過支付一定數量的TTC來獲取發私信的機會，所支付的TTC將直接轉給被私信方。
- **折扣券**。TTC還可以用于兌換線上線下商品代金券，讓用戶獲得更多實際價值。

其他的DAPP可根據產品形態和調性設計更為豐富的TTC應用場景，如打賞、付費推廣、互動游戲等等，以幫助用戶更好體驗TTC在產品中的價值。

O3

TTC 生態系統



TTC生態系統

爲了讓去中心化和貨幣化的社交網絡能有更廣泛的應用，給更多的用戶提供真正有意義的社交價值，TTC開放平臺爲廣大開發者提供一整套便于接入和管理的應用開發接口協議和清算系統，任何開發者都可以通過TTC開放平臺開發屬於自己的區塊鏈應用，並在平臺上進行發布和推廣，通過去中心化和貨幣化的理念，快速獲取用戶，在爲用戶提供更多價值的同時實現商業價值。

同時，TTC開放平臺將爲各DAPP的廣告商提供統一的廣告平臺，TTC作爲廣告平臺的通用代幣。廣告商可以選擇多個DAPP的用戶群體，動態組合優化廣告費用的分配，以增加廣告覆蓋群體的多樣性，帶來更大的廣告價值。

隨着TTC開放平臺影響力的擴大，越來越多的DAPP加入到TTC體系，會爲平臺帶來如下影響：

- TTC上DAPP的用戶之間將使用同一套用戶系統進行管理，用戶在不同DAPP之間實現價值交叉變得可行，將會提升整個TTC體系的豐富性和健壯性。
- 隨着開放平臺內用戶量和多樣性的提升，第三方投放數量也隨之擴大，推廣形式更多元，TTC體系的整體商業價值增加。

- 由于TTC總量不變，持續增長的第三方推廣使得TTC的價值持續提升，後續每個用戶每天獲得的TTC減少，但所持有的TTC將更有價值。

tataUFO作為開放平臺上的初創成員，將首先完成個性化生活分享平臺的構建，後續的開發者可以在TTC開放平臺上獲得更加穩定的服務，讓全球更多用戶體驗到去中心化和貨幣化社交網絡的價值。

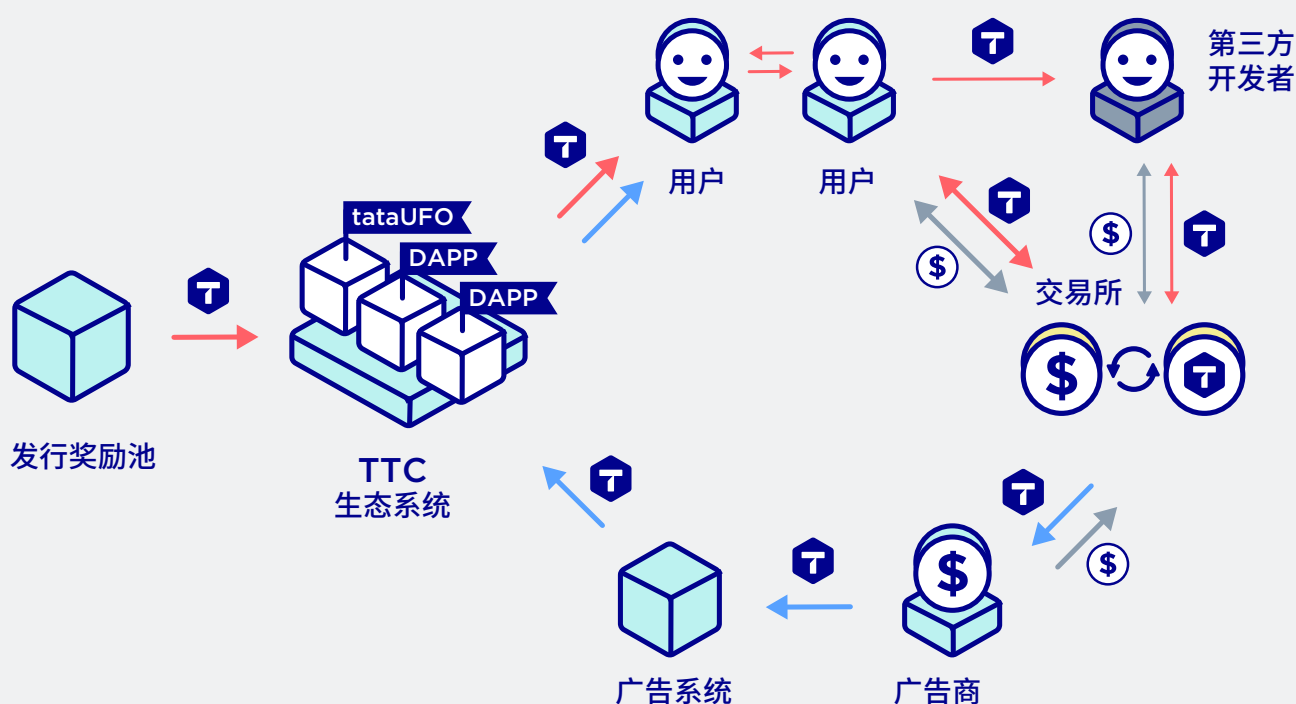
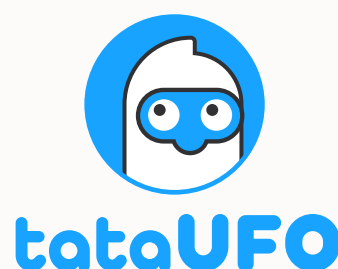


圖6. TTC開放平臺及價值鏈條

tataUFO

tataUFO于2013年上綫，是一個基于年輕人社交網絡的個性化生活分享平臺，通過用戶向好友及其他用戶展示自己的生點滴，促進用戶間的互動和關系建立，創建一個屬于年輕人的動態分享和社交圈子。



tataUFO借助大數據和雲計算，給用戶提供精準的“個性化推薦”服務，幫助用戶發現可能感興趣的新鮮內容和結交更多朋友，同時用戶也能在tataUFO中與自己的朋友交流互動。

在經過將近5年的持續運營中，tataUFO始終致力於為年輕人提供社交分享平臺，產品目前已經有超過1000萬的注冊用戶，核心用戶為中國一二線城市的高校學生和年輕人群體，用戶對產品形成了較強的品牌認知和忠誠度，也為產品後續的發展和嘗試提供了堅實的基礎。

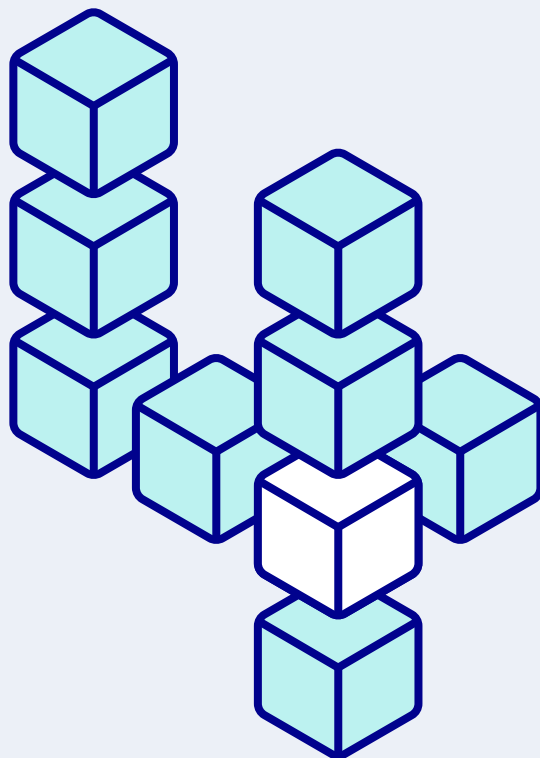
tataUFO接下來將作為TTC開放平臺上第一個DAPP，利用區塊鏈技術為用戶提供去中心化的社交網絡服務，通過開放穩定公平的機制，對現有平臺進行升級，為用戶提供更大的社交價值。



圖7. tataUFO產品示意

O4

TTC 基金會



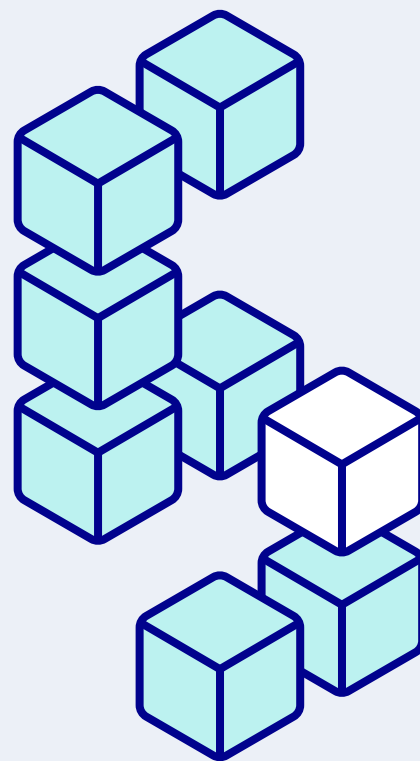
TTC基金會

TTC基金會是一個獨立、民主、非營利的治理機構，用來對TTC進行開放治理，確保生態體系正常有序地運行，TTC基金會的職責包括：

- 通過增加TTC開放平臺上的DAPP，建立全球的社交生態系統。
- 確立一套公平透明的治理流程，對TTC獎勵引擎、參與規則、法律事項、內容合規準則的相關決策進行監督。
- 建立并完善去中心化及貨幣化社交網絡的智能合約，推動用戶價值的提升和網絡效應。
- 支持基于區塊鏈技術的社交網絡生態系統的完善，指導和資助第三方開發者，并制定TTC對體系中的各DAPP的動態分配機制，使生態系統持續發展并創造更大價值。

爲了加快TTC全球生態系統的建立，TTC基金會將積極調用及分配資源爲開放平臺獲取更多的DAPP，通過優質的DAPP爲整個TTC生態帶來更多用戶。同時，TTC基金會將尋找介入TTC生態系統中有增長潛力的領域，通過積極的投資和并購，實現TTC平臺的快速增長。

05 技術考量



在鏈與脫鏈平衡

TTC將在Ethereum平臺上進行開發，Ethereum作為目前使用最廣泛的區塊鏈網絡，在較好的穩定性和通用性之外，也有一些潛在的問題。隨着Ethereum上DAPP及用戶數量的增加，目前其上DAPP每天的交易量目前已經超過10萬筆，大量的交易量導致平臺處理交易的響應速度變慢，對用戶使用帶來很大麻煩。另外，基於Ethereum區塊鏈的交易需要為每筆費用支付交易費用，也給用戶帶來了一定的經濟損失。

基於此，我們將實施混合式在鏈與脫鏈交易服務。基於TTC的交易將在Ethereum區塊鏈上記錄，同時TTC基金會將開發一個脫鏈分類賬系統，用以記錄用戶的普通行為，並在與交易行為有關的時間節點上進行區塊鏈同步和計算，以最大提高系統的效率，並對基於TTC系統上的全部DAPP具有良好的可擴展性。在取得在鏈與脫鏈平衡之後，DAPP中的用戶將享受相對流暢且標準統一的用戶體驗，並且滿足了TTC平臺的可擴展性。

TTC基金會將持續優化在鏈與脫鏈交易服務，為所有的DAPP和用戶提供最好的產品體驗。我們將致力於實現完全在鏈的方案開發，屆時TTC生態體系將脫離Ethereum平臺，成為獨立的區塊鏈解決方案。

技術架構

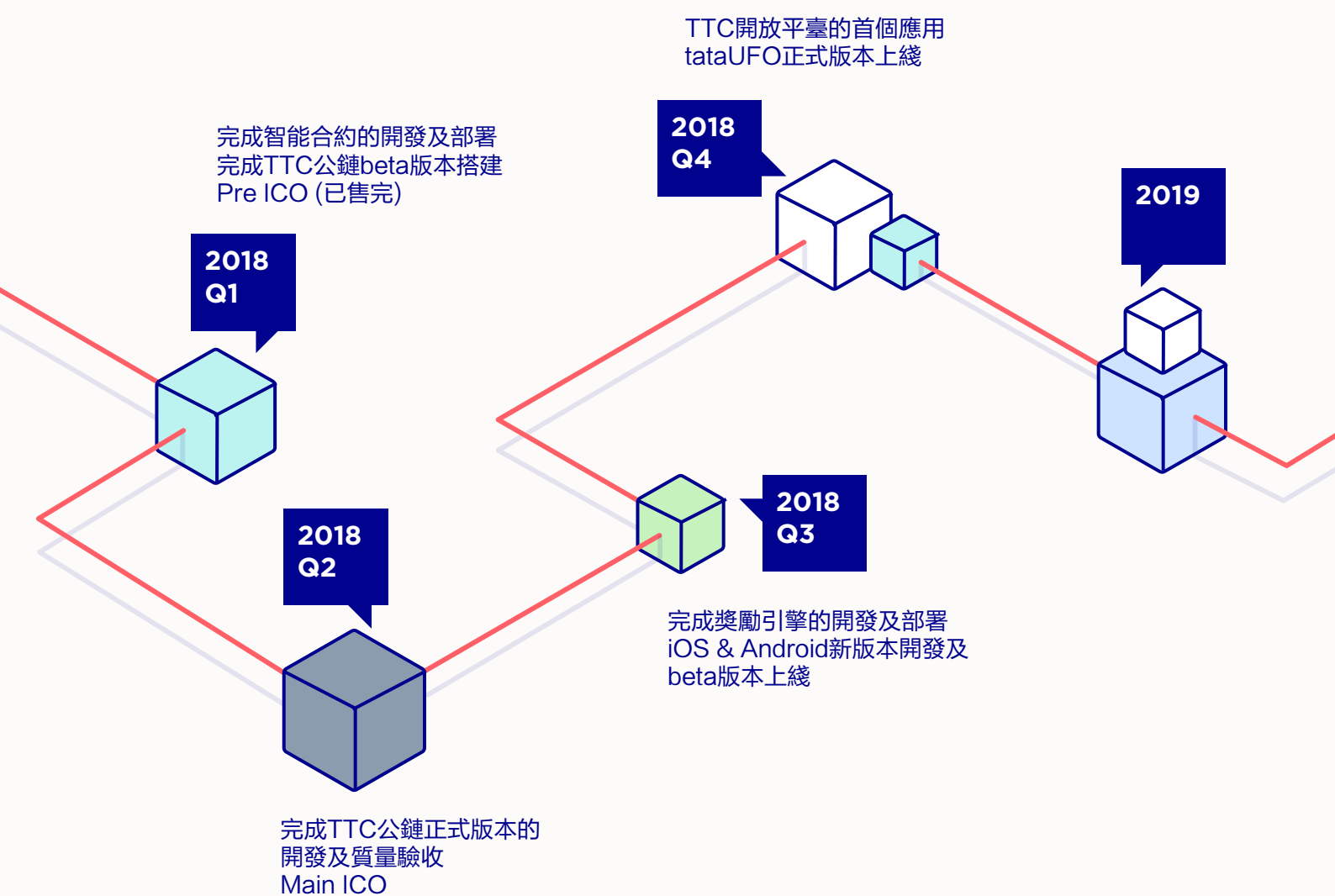
技術實現上TTC體系由4個層次組成：

- **區塊鏈工具層**。底層框架，提供了數據庫、網絡、區塊格式、共識算法等服務。
- **TTC核心層**。實現統一授權、代幣系統、收益分配、錢包等核心業務邏輯。
- **TTC開放平臺**。提供統一的内容、評分及用戶管理，反作弊及審核解決方案、廣告平臺等。
- **服務與應用層**。第三方開發者可開發自己的服務與應用，參與到TTC生態體系中。



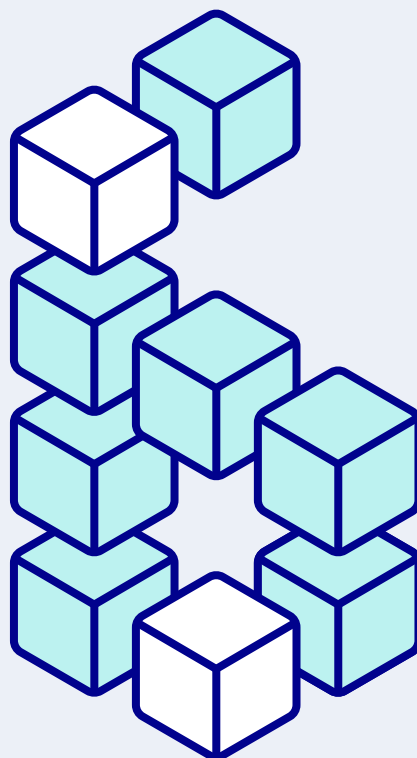
圖7. TTC系統的技術架構

路線圖



O6

TTC 發行計劃



價值模型

產品TTC獎勵池的發行將按固定計劃進行，自產品正式啓動開始，第一年發放總獎勵池的50%，從第二年起每年發放的總獎勵金額減半。同一年中，每天發放的數量相同，按照內容獎勵和聲望獎勵兩部分分配給產品用戶。

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

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

由圖7所示，隨着用戶量的增長，用戶平均每天獲得的TTC數量遞減。

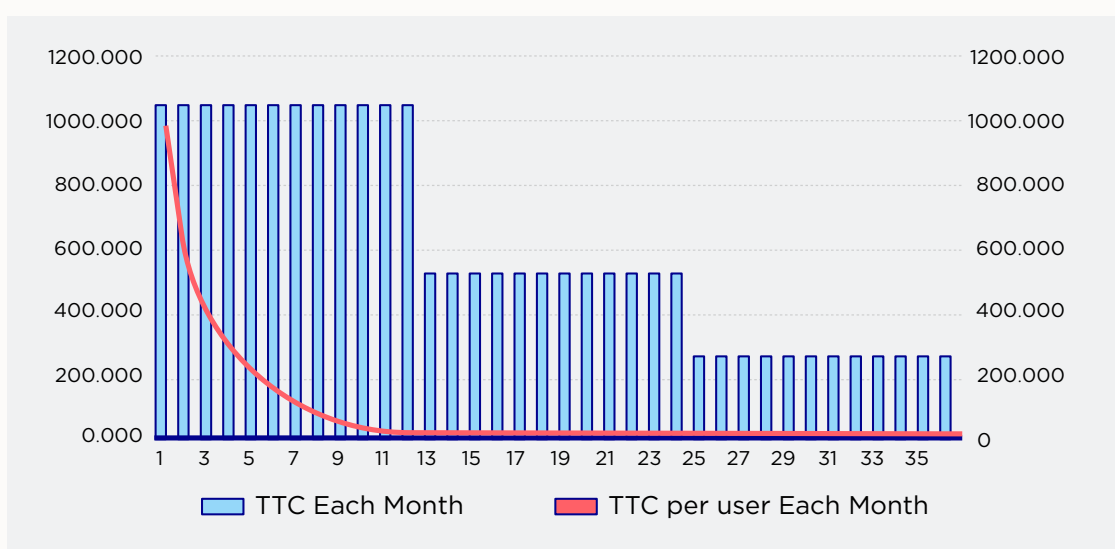


圖8. TTC發放計劃及用戶獲取TTC隨時間的變化示意

在不考慮交易所影響的情況下，TTC的價值取決于第三方的推廣費用。根據其他平臺（如今日頭條）推廣數據參考，當產品用戶量較低時，每用戶每月可貢獻 0.15USD 的推廣收入，當用戶量級較高時，每月貢獻的推廣收入可達到 1.5USD。根據社交產品共性及tataUFO產品特點，用戶活躍情況隨着用戶量增加，先從100%下降到42%，後漲回約50%。

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

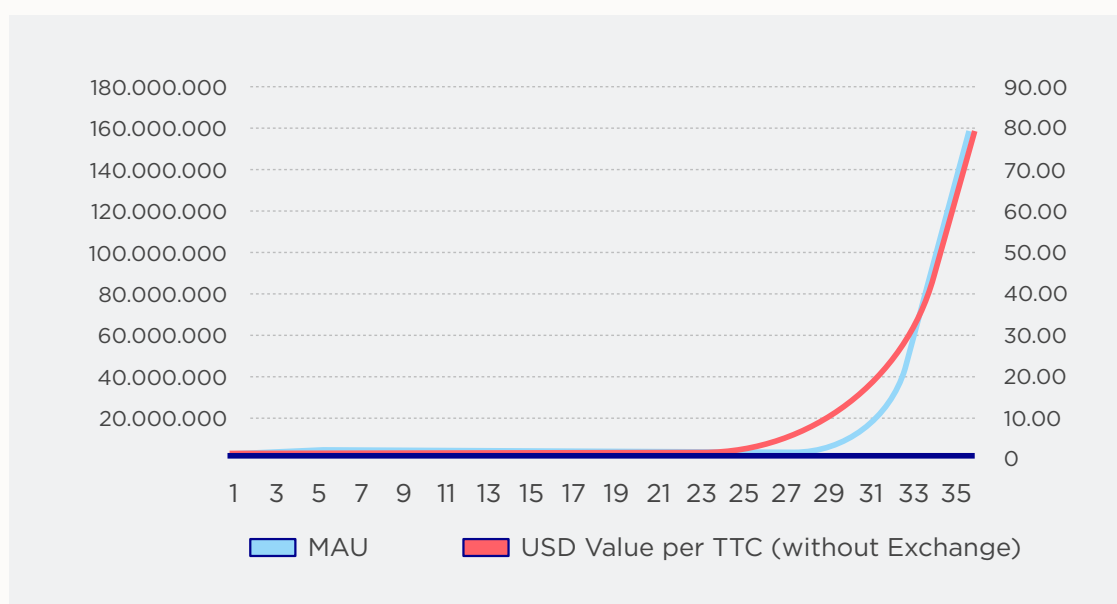


圖9. 每TTC與美元的價值和MAU的關係

僅考慮產品因素導致的價值變化，不同預期下TTC相對於美元的價值在3年內的增長情況：

		初 始	一年後	兩年後	三年後
樂觀版	TTC總價值		2,444,310	240,267,762	19,821,693,989
	用戶量		508,066	13,767,563	328,058,424
	TTC價值（USD）	0.01	0.02	1.41	101.65
保守版	TTC總價值		2,091,044	127,842,748	7,750,245,530
	用戶量		447,690	8,112,224	146,257,080
	TTC價值（USD）	0.01	0.02	0.75	39.74
悲觀版	TTC總價值		1,966,611	89,841,255	3,604,161,409
	用戶量		426,002	6,043,228	75,981,640
	TTC價值（USD）	0.01	0.02	0.53	18.48

表2. 不同情況下TTC價值在3年內的增長情況

ICO方案

TTC將在ERC20平臺上進行發行，發放總量為1,000,000,000。其中的25%將用于ICO發售，ICO參與者可以通過以太幣（ETH）購買TTC。

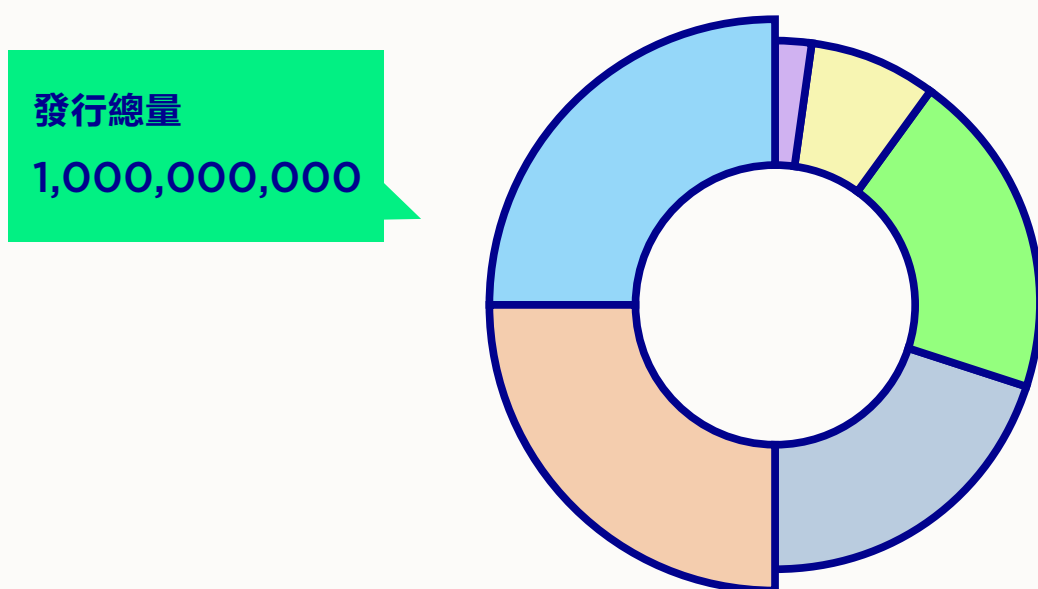
General Information

代幣名稱	TTC
發行平臺	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

**早期發售**

25% 250,000,000 TTC

獎勵池

25% 250,000,000 TTC

生態建設

20% 200,000,000 TTC

基金會

20% 200,000,000 TTC

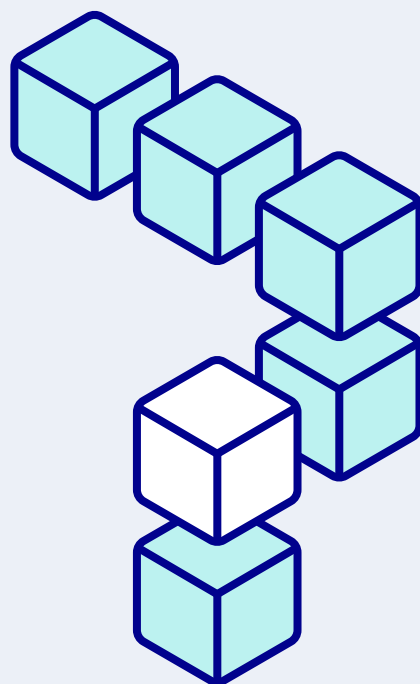
團隊

8% 80,000,000 TTC

老用戶/ bounty

2% 20,000,000 TTC

07 團隊



核心成員



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主席&創始人

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tataUFO，創始人& CEO
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顧問



Simon Kim
Hashed, CEO & 合伙人
軟銀風險投資, 風險合伙人



張原
比特大陸, CEO助理、區塊鏈產品經理



周碩基
FBG Capital創始合伙人



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Hashed, 合伙人、首席行政官



曹洪偉
百度, 渡鴉科技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

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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.