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Project Summary

Overview:

In a modern world where digital transactions are increasing in popularity by the year, the demand for new innovative cryptocurrencies is high. In 2015, there was an increase in the percentage of smartphones users who had engaged in mobile banking to 53% of users and mobile payments to 24% of users. Research has shown that among mobile bankers, higher shares of young adults have utilized their phones for digital transactions, demonstrating the popularity and the consumer base in innovating and developing forms of e-currencies, for generations to come. Furthermore, of smartphone users reporting they did not engage in utilizing digital transactions through their mobile devices, 73% claimed security concerns as being the main prohibiting factor.[1]

For these reasons, via a secure, user friendly platform, Self-Tracking Cryptocurrency seeks to revolutionize digital transactions for individuals and organizations across the world. Self-Tracking Cryptocurrency will have two main distinguishing functionalities. First, it will allow the spender to specify and restrict how funds can be used. The system will then automatically verify and approve the use of funds based on the spenders specified restrictions. Second, the cryptocurrency can track transactions and send notifications to the spender and other necessary personnel verifying funds were used appropriately.

Furthermore, the cryptocurrency will implement and enhance current security practices, to address users' security concerns, which are currently prohibiting them from fully taking advantage of digital transactions. The currency will implement necessary precautionary measures to prevent social engineering attacks, data breaches, outside infiltration and other common security threats.

Intellectual Merit:

The proposed project will address two innovative challenges that will distinguish Self-Tracking Cryptocurrency from current cryptocurrencies. First, it will address the ability to track how funds are being spent over several transactions. Second, it will address the ability for a spender to restrict how funds will be used, and then receive notifications that funds were used as specified. The development of algorithms to address these two functionalities will create a system that increases the security of digital transactions for businesses, individuals and organizations.

Broader/Commercial Impact:

The proposed system will mark the beginning of a new way in which spenders will have assurance their funds are utilized in ways they have specified and restricted. Large businesses will be able to automate the allocation of funds from the top all the way down to sub-departments. Self-Tracking Cryptocurrency will then provide automatic notifications, and feedback up the hierarchy that funds have been spent appropriately. Furthermore, government agencies will be able allocate welfare funds and then verify recipients are utilizing funds appropriately. Lastly, nonprofits would be able to allow donors to specify how they desire their donations to be spent, potentially facilitating an increased interest in donating. The adaptability of the cryptocurrency will address several pressing current needs of individuals and organizations.

[1] http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201603.pdf

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Elevator Pitch

Self-Tracking Cryptocurrency will create a unique ability for users to track and restrict digital transactions, allowing businesses, organizations, and individuals across the world to facilitate secure transactions with ease. By specifically designing a user interface for two user types, the sender, and the receiver, the system will efficiently give the functionality of tracking the transactions of the cryptocurrency, while also giving the sender the functionality to restrict the use of funds. Once the receiver has utilized the currency, the sender receives a notification confirming appropriate utilization. The restriction, tracking, and verification functionalities of the cryptocurrency are the distinguishing factors that set this system apart from current e-currencies, including cryptocurrencies.

Self-Tracking Cryptocurrency innovates current e-currencies, including cryptocurrencies, through three main features. The first feature, the product implements is the ability to trace how funds are used over several transactions. The second feature, is the products ability to allow users to specify and restrict how they want funds to be utilized prior to authorizing the use of funds to businesses and individuals. The third feature, is the ability to automatically notify spenders and designate personnel that funds are utilized as restricted, in real-time.

The Self-Tracking Cryptocurrency provides large-scale companies a system to automate the budgeting and end-of-the-year spending report processes, simplifying a significant administrative overhead all corporations face. From the top down finance directors, can allocate and restrict funds to appropriate departments for use on approved vendors and products, giving the ability for designated spenders to make purchases without needing to go through an approval process, as the system automatically verifies purchases based on specified restrictions. Furthermore, upon the spending of the funds the director and designated personnel receive a notification confirming appropriate utilization.

Self-Tracking Cryptocurrency can also be used by government departments to provide funds for those receiving welfare from the government or for other government funded programs. Departments with this product can specify and restrict specific vendors and approved products, automating the reimbursement, spending and approval processes. The automation of the system will reduce the resources and time necessary for not only departments disbursing funds, but also recipients of funding.

Furthermore, by using Self-Tracking Cryptocurrency nonprofits will benefit from the increased confidence of their benefactors. Self-Tracking Cryptocurrency will allow benefactors to specify and restrict how they desire their donations to be spent, boosting their confidence that their money is used in-line with their support for the nonprofit organization or cause. Benefactors will no longer face the deterring factor to not donate to an organization in fear their money will be utilized in ways they do not support.

Self-Tracking Cryptocurrency will have a versatile and customizable interface which will result in a diverse customer base. The product will be useful for consumers in both the private and public sector, as well as for users ranging from individuals to large scale companies. The product will take the steps necessary to enhance features of current cryptocurrencies into a product that automates the process of verifying the spending of funds in manners desired by spenders or investors. Furthermore, the product will increase efficiency for businesses and organizations looking to track and restrict the expenditure of funds.

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Commercial Opportunity and Social Impact

The Commercial Opportunity:

The innovation behind a Self-Tracking Cryptocurrency can transform the current e-currency, including cryptocurrencies, market. The Self-Tracking Cryptocurrency has three main innovative features. The first feature being the capacity to restrict how the funds are spent and allocated. The second feature being the ability to automatically in-real-time notify spenders, allocators, and designated personnel that funds were used as restricted. The third feature being the capacity to trace how funds are used over several transactions. These innovations will set the Self-Tracking Cryptocurrency apart from the current e-currencies, including cryptocurrencies, on the market. The ability to automate these tasks and provide assurance that transactions are occurring as intended has the potential to greatly facilitate economic growth and decrease the time necessary for transactions to occur. By creating an online system that gives users more confidence and assurance in the security of the utilization of their funds, economic spending will increase and economic growth will occur.

Furthermore, the market and consumer base for the Self-Tracking Cryptocurrency is diverse with the ability to revolutionize the way that individuals, organizations, and business facilitate and execute transactions. In the current market, there is a lack of assurance that the utilization of funds is as a donor, allocator, or provider intends. For these reasons, the Self-Tracking Cryptocurrency creates features to provide customers with an assurance that is currently lacking in the market of online and physical transactions. This product will be designed to be flexible and adaptable, with the ability to be customized and utilized for the unique individual purposes of consumers. For example, individuals will be able to use the system to restrict the use of money, creating a secure system that allows users to facilitate secure transactions without having a concern about how funds are utilized.

The project is estimated to be completed within an eight-month period, as seen in the timeline outlined in the subsequent section. Over this eight-month period the project is expected to take approximately 500 billable hours to complete. The main cost of the project will is the billable hours put in by the software engineer developing the algorithms for the project, by paying a software engineer the market rate for this project it is estimated that the project will cost $15,000 to complete.

The Self-Tracking Cryptocurrency will generate revenue using the same protocol that many of the existing e-currency, e-commerce, and cryptocurrency systems use. Access to the Self-Tracking Cryptocurrency product will be obtained by purchasing a membership fee for the product. The annual or lifetime membership fee will be set based on the size of the individual, or organization purchasing the product. Individual users will be charged a membership fee of $25 annual fee, coming out to slightly more than $2 a month. Small business and nonprofits will be charged a $50 annual fee. Medium-sized businesses will be charge an annual fee of $150. Lastly, large corporations will be charged an annual fee of $300. These fees will be adjusted and modified to meet the supply and demand as the market changes.

After considering the different membership fees, I calculated a liberal estimate that approximately 115 memberships need to be sold to cover the cost of production. This will not be a difficult task as it requires less than 30 of each type of membership fee to be purchased. The subsequent descriptions below of the marketability to users justifies that selling 115 memberships will not be a difficult goal to achieve.

Additionally, the system will make money by charging a transaction fee for the use of credit cards, while allowing the use of debit cards and bank transfers to be free, similar to how many of the competing companies currently are operating. One way to draw more users to the system and away from

competitors is to make this transaction fee slightly lower than the competing systems in the market, while still ensuring that the system can make a profit.

The profit from transaction fees and every membership fee sold after the 115-membership-threshold, will go towards product profits and covering the costs of updating and innovating the system as membership grows. These updates will include additive features to meet consumers' needs, as well as the expansion of the infrastructure to support the increased user-load on the system.

Non-profits and organizations will be able to use the system to give their donors the option to restrict the spending of donations. The ability to limit the utilization of donated funds will create a currently non-existent assurance to donors that the use of their money are as they desire. The system will create the potential to increase donations nonprofits receive drastically, since currently the main deterrent to donating to nonprofits is the lack of assurance donations will be spent directly on projects and not on administrative overhead. Marketing the product to nonprofits will not be difficult since nonprofits are consistently looking for the ability to increase their annual donations.

Additionally, businesses will be able to use the system to restrict how they allocate funds starting from the Chief Financial Officer all the way down to the sub-departments and designated spenders. The system will also automate the spending approval process, as sub-departments' resources are restricted in the resource allocation process, and funds are approved real-time based on the specified restrictions. Additionally, this will automate the process for businesses in compiling the utilization of their overall budget and sub-budgets. The notification process, to designated personnel in the corporate allocation hierarchy, occurs simultaneously with the spending of funds, automating the process of reporting budget utilization. The benefits that the system will provide business through the automation of task that currently have large administrative overhead costs, will save businesses far more than the annual fee making the choice to purchase the product a logical business decision.

The current competition for the product is other cryptocurrencies and e-commerce sites on the market. However, the beginning stage of this project revolved around researching the pros and cons of existing systems. Through this research the project has determined portions of the competition that are not patented and are working to be incorporated into the project. In addition to these aspects the project will add the innovative features, outlined above, that are not currently on the market, creating a system that addresses the current needs of the market.

The key risk of bringing this innovation to the market is the cost of securing a system that comes with the financial nature of the system. Furthermore, research has proven that the main deterring factor currently preventing users from engaging in digital transactions are fears that the systems are not secure.[2] Systems that involve financial transactions are always at high risk of being attacked, as bad actors are interested in achieving financial gains possible through exploitation of a financial system. The potential of attack creates a high cost for security and a high risk of infringement, meaning the system must take adequate steps to address consumers concerns and ensure them that proper checks have been put in place to secure the system and prevent attacks. Knowing that these risks exist the Self-Tracking Cryptocurrency has developed several tests and mechanisms to ensure security and minimize accessible data if an attack is successful.

Societal Impact:

The Self-Tracking Cryptocurrency will address the societal need to create a more efficient way of automating the process of verifying and restricting the utilization of funds on all levels of transactions,

[2] http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201603.pdf

from individuals to large Fortune 500 corporations. The ability to automate and provide confidence for the everyday actions of transferring and spending money has the potential to revolutionize the way that money changes hands. The increased reassurance in verifying the utilization of funds has the potential to increase the number of transactions significantly. Furthermore, the system has a social benefit of automating the tedious tasks of managing budgets and approving the use of funds in big businesses, allowing companies to utilize resources in ways that better serve their mission and to devote employee's times to tasks that are not easily automated.

The extensive use of the Self-Tracking Cryptocurrency system will result in a larger societal benefit of consumers' having an increased confidence in the system facilitating their monetary transactions. Furthermore, the increased automation of everyday tasks will have greater benefits than costs to our national and worldwide economy. The ease with which transactions can immediately occur will stimulate economic growth and increase efficiency in businesses.

The system will impact all users, as well as the broader financial system, including the customers listed above, and citizens across the nation, as the government will be able to utilize the system to streamline the process of distributing funds to agencies, and citizens who receive funds from the government. The increase in efficiency will significantly decrease the stress and confusion the average citizens faces when receiving and spending government funds. The ability to streamline the process for governments and business to allocate and utilize funds will substantially increase the quality of life of citizens across the nation.

Additionally, since the system is designed to mask the ability to trace the spending of funds unless the user is specifically designated to receive notification, the system will facilitate legal transactions in countries where oppressive governments closely monitor transactions. The system will allow individuals who are staying or working in oppressive regimes to make purchases without the fear of prosecution or governmental monitoring, facilitating the ability for the systems to be used in dynamic and unique ways to facilitate social work and social product in areas that are currently difficult to facilitate transactions without governmental monitoring.

This system will not present any environmental issues or health issues, but it does have the potential to decrease both through moving transactions online allowing more efficient utilizing of physical resources. However, unfortunately the system does have the potential to be used in unintended ways that will require regulation and checks to prevent. Since a fundamental purpose of cryptocurrencies is to mask the identity and transactions of those utilizing the system to all external personnel, the system can be used by bad actors to facilitate illegal transactions. For this reason, an additional check will be added to the system to ensure all transactions facilitated through the system are legal in nature. Adding this additional check will not be a difficult task as the system is already designed to restrict the use of funds. Therefore, the same process used to limit funds as restricted will be used to ensure that ALL transactions through the system are legal.

Lastly, the global consequences of the product solely regard the potential the system has in facilitating international transactions. The design of the system has considered both national and international regulations to ensure all transactions are complaint with current financial regulations. As a versatile system that is adaptable to specific needs of individuals and organizations, Self-Tracking Cryptocurrency, has the potential to drastically stimulate global economic growth. However, the global nature of the system creates a need to address global scalability and international laws. The barriers to entry will be lower for countries that already have pre-existing commerce treaties and agreements with the United States. In depth research on such agreements, international regulations, and national laws of other states will be completed prior to introducing the system to states outside of the United States.

Conclusion:

The Self-Tracking Cryptocurrency has a high potential to positively impact both the nation and the world through social and commercial innovation. The utilization of the innovative functions of the Self-Tracking Cryptocurrency will facilitate global economic growth, while substantially increasing the efficiency of everyday tasks of citizens, businesses, nonprofits, and governments. With very minimal and addressable adverse effects, investing in the creation of this system is low-risk with the potential of high social and monetary gains.

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Technical Discussion and R&D Plan

Technical Discussion:

There are many technical challenges and risks in bringing a new currency to market. Of the technical risks and challenges, this project identifies and addresses the following five concerning the project. The first risk being security measures revolving around ensuring appropriate handling of funds and data. The second risk being competition within the e-currency and e-commerce markets, including addressing the costs of entering the market, and the current and future projects of. The third risk being legal issues that arise from the use of the system for illegal trade and activities. The fourth risk being the systems design and capability to handle users accessing the site at the same time, including but not limited to, assessing the maximum and average user load on a system at any given time. The last risk is ensuring the user interfaces' (UI) is intuitive and simplistic enough to attract and retain consumers. The design of the UI must ensure that the project does not have too many or not enough features that will result in users reverting to competing products.

The biggest risk in the development of a new currency is ensuring the proper security measures are in place to protect the assets of users. Without proper security protocol and absolute assurance user assets are protected without personal risk, users will not use the currency for fear of incurring a personal loss. Current banking agencies and currencies address the issue of security by having the currency backed by the company and/or system of government. Banking institutions with online banking facilitating the exchange of non-physical currency make a profit and cover fraudulent transactions through charging fees to have an account, charging interests on credit balances, charging late charges, and other various fees. These profits allow companies to cover all fraudulent expenditures that occur from the use of a non-physical currency without the spenders' authorization.

However, the solution for the Self-Tracking Cryptocurrency project is not as simple as just distributing the cost among the users through various fees and charges. Since the project is not intended to be a credit system, the system must instead have checks in place to ensure the utilization of funds only by authorized users on purchases that meet the specified restrictions. As a fail-safe measure the system can use the transaction fees and memberships fees outlined in the ‘Commercial Opportunity’ section to cover fraudulent transaction costs, so that the burden does not fall on the consumer.

However, the unique, innovative feature the system implements to restrict and track funds creates an increase in assurance that only authorized users are executing transactions. The assurance that unauthorized users are not able to breach the system and execute transactions, is implemented in the algorithm to confirm a user's identity as a designated spender of funds prior to the execution of a transaction. By creating a unique encrypted user id for each transaction, adverse actors will not be able to identify patterns or user-ids that are needed to access funds.

Secondly, there is the challenge that the system must offer enough innovative features to motivate users to switch from their current e-currency or cryptocurrency. For users to go through the effort of switching from their current product, the system must offer a substantial feature or incentive that is not available elsewhere. A major challenge is the project is entering an established market, making the barriers to entry of a successful product greater than in a new market. Once the project goes to market, the security and success of preexisting currencies leaves a minuscule margin of error. If the first users are not pleased with the features of the product it will be extremely hard for the product to recover.

Extensive research on the competition has been conducted, to address the concern of entering an established market with pre-existing competitors. I have considered how to utilize non-patented features of existing cryptocurrencies and e-currencies, concentrating mainly on open-source code that can be modified to fit the needs of the Self-Tracking Cryptocurrency project. Through the utilization of pre-existing technology, I will focus the majority of my efforts on implementing the innovative features outlined in this proposal.

Additionally, the project has several legal issues to address before going to market. The legal repercussions of existing cryptocurrencies failure to prevent the facilitation of illegal transactions and exchange of illicit goods and services is an issue many legal scholars and financial regulators are currently analyzing. However, the Self-Tracking Cryptocurrencies feature of verifying the use of funds based on a set of specified restrictions inherently prevents the system from being used for illegal activity. Since the project will always check funds are appropriately utilized, the implementation of an initial test to ensure a transaction is deemed legal will not be difficult. This initial test will further ensure that no matter how an individual transaction is restricted it will not go towards illegal funds.

The fourth major challenge the project will face in design is determining the system requirements necessary for the given user load. It is essential that there is not a user load greater than the system can handle, particularly throughout the initial roll out of the product. If the product has issues when it hits the market it will not be viewed as a viable competitor to established currencies. To address this risk, the necessary system requirements will be determined by analyzing the traffic load and infrastructure of existing comparable systems. Furthermore, the final project will have checks in place to verify legitimate requests to the system to prevent repeated distributed requests from overloading the servers.

The last major challenge that the project addresses in its design is the user interfaces' (UI), ability to attract and retain consumers. If the UI is not implicitly intuitive, users will seek competitors' products. Furthermore, if the system aims to implement too many features, the UI will quickly become difficult to understand, causing users to prefer forfeiting some functionality for greater usability. Alternatively, it is necessary for the project to implement innovative features that will draw in a client base. For this reason, the system will have limited mode options and advanced mode options where users can decide the necessary features for their goal. Additionally, the UI will be optimized for both desktops and mobile phones to increase the accessibility of the product.

R&D Plan -- Project Objectives:

- Create a system that will restrict and trace the execution of transactions
- Send notifications to designated users verifying transactions executed as restricted
- Ensure data and currency security for all users of the system
- Ensure anonymity of users, unless explicitly stated

R&D Plan -- Project Timeline:

September 2016: Beginning of Research and Design
- Conduct Market Research: Research cryptocurrencies and e-currencies already on the market
- Outline the components of the parts of the project
- Determine the audience and main objects of the project
- Develop the user interface on paper
- Finalize the design diagrams of the project
- Finalize the proposal

October 2016: Design Phase
- Create dependency diagrams

- Continue market research
- Design the algorithm for implementing the restrictive functionality
- Begin the implementation of the user class based on restrictions
- Conduct research on commercial impact and societal impact

November 2016: Transaction Implementation

- Develop the passing of transactions from one machine to another
- Ensure that currency is updating properly and conducting a check on the restrictions and users
- Research security library in java

December 2016: Implementation Integration -- Database and Transactions

- Integrate the transactions with a database
- Develop a tree demonstrating how transactions are occurring
- Implement the ability for currencies to be split and distributed to several users

January 2017: Transaction Development

- Implement the ability for the transactions to be sent and received from a server
- Ensure security measures are in place to preserve anonymity
- Begin the development of a marketing strategy

February 2017: Mutable Restriction Tree Implementation

- Conduct research on existing notification systems
- Integrate notification with the backend components
- Determine the process that allows users to modify restrictions that were not predefined

March 2017: User Interface Implementation and Testing

- Design and develop the user interface
- Integrate the user interface with the back-end component of the project
- Determine necessary product checks to ensure that the product is ready for market

April 2017: Final Implementation

- Integrate all components
- Finish development of any component that needs further enhancement
- Extensive troubleshooting and debugging
- Finish packaging for market

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Statement of Revision

I put extensive work into the revision of my paper. I took my peers' comments and the comments of the Alan on my previous assignments to go back through my paper and address some of the prominent issues. I went through my paper to rework the sentence structure of several sentences, addressing the style, wording and presentation of ideas throughout the paper. I made sure I did not use 'vague pronouns' in the proposal. Additionally, I revised my 'commercial impact' statement to addressed the marketability of the product. I reorganized the order of several components of my proposal, and ensured that the style was in-line with the parameters of the assignment and consistent throughout the proposal.