CTIS 411 Senior Project I

Initial Plan

2018 – 2019 FALL

Bilk(c)ash

- TEAM 4 -

MEMBERS

Yiğit Usta
Fatih Yavuz
Altuğ Ankaralı
Canberk Demirci

Project Advisor: Okyay Say

Table Of Contents

Executive Summary

This project aims to develop a payments system based on an open source permissioned blockchain such as Quorum or Hyperledger Fabric. In addition to handling the usual point of sale and money transfer use cases, the system will also provide an SDK for easy integration into existing e-commerce sites by third parties.

Project Purpose

Following the initial success of Bitcoin, the idea of an immutable append-only distributed ledger being used as an international payments system has attracted great interest. As the volume of daily transactions on Bitcoin expanded, however, it became clear that modifications would be required to blockchain if it were to support the typical requirements of a payments system whose use cases are normally handled by credit and debit cards, and behind the scenes, by services such as Swift.

Companies do not want their detailed sales figures to be easily accessed by rivals. Consumers expect their payment process to be complete within fifteen seconds. At scale, a payment system will have to be able to process transactions at a sustained rate of well over one hundred per second. If the payment system is to support micropayments, per transaction fees should not be higher than those found in existing systems, such as credit cards. Judged against every one of these requirements, Bitcoin falls short.

The industry is, of course, well aware of Bitcoin's shortcomings as a general purpose micropayment system. Thus various alternative distributed ledgers have emerged, some with their associated cryptocurrencies, improving on Bitcoin in various ways for certain use cases.

Some of these distributed ledgers, like Quorum and Hyperledger Fabric, already support a sufficient set of features to form the basis of a distributed, fast and confidential payments system.

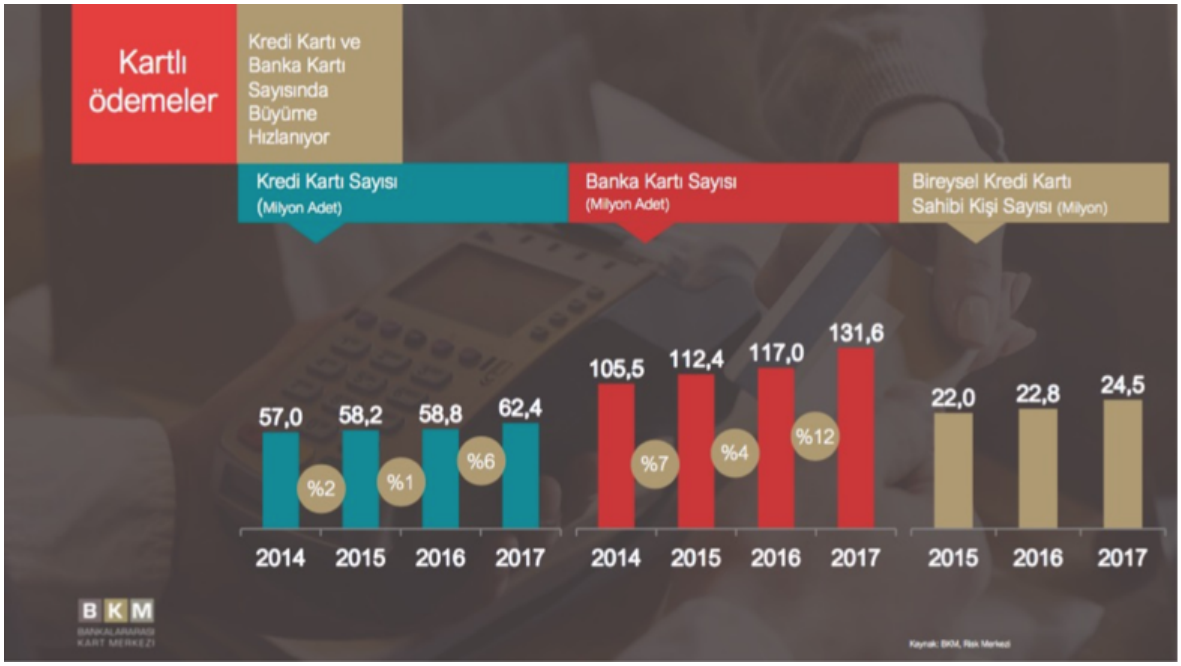
Bilkash's purpose is to be a payment system with an easy to SDK to be used to satisfy payment gateway needs especially in e-commerce websites eliminating the shortcomings mentioned.

Project Scope

Blockchain is fast growing technology. Based on blockchain, there are many applications built. One of them is Bitcoin which solves the problem of transferring money from one country to another country. It has disadvantages for it to be used as a payment system for e-commerce websites. For such reasons, there is an opportunity in Turkey to develop a SDK for e-commerce systems to accept payments based on cryptocurrency and for those who does not want to use credit card for online purchases.

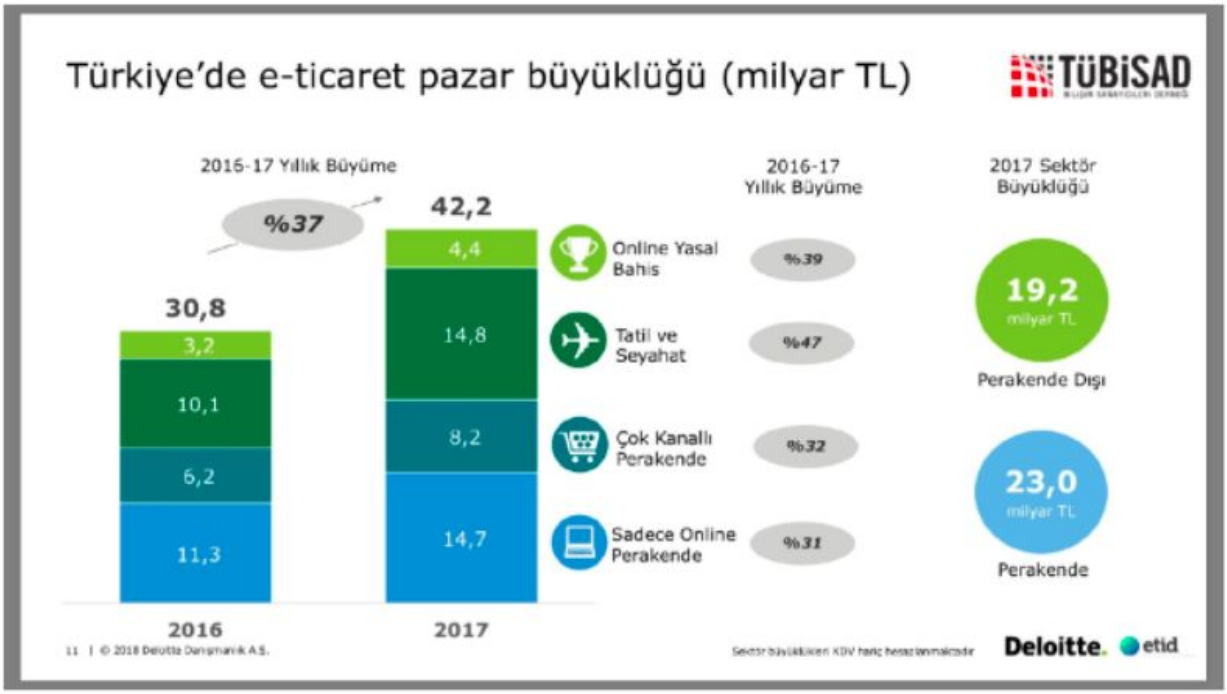
Bitcoin transactions may take from 10 minutes to 1 day to complete. Such duration for payment process is extremely long. In addition, Bitcoins' transactions are easily tracked and therefore do not provide confidentiality that most businesses demand. Other than that, there is no cryptocurrency based payment provider in Turkey that secures and validates its users.

It is a fact that, some people hesitate to use their credit for online purchases since some are afraid for possible credit card information theft.



https://webrazzi.com/2018/01/24/turkiyenin-2017-yilindaki-online-kartli-odeme-istatistikleri/

The figure above demonstrates that although number of people having debit card increasing, the same increment cannot be observed on number of credit card users.



https://webrazzi.com/2018/05/22/tubisadin-raporuna-gore-e-ticaret-hacmi-yuzde-37-buyuyerek-422-milyar-tlye-ulasti/

According to TÜBİSAD e-commerce market has increased 37%. It means that there more and more people purchasing online and and alternative payment for the e-commerce is needed.

Bilkash offers 100 transactions per seconds and provides confidentiality on transactions. On the other hand, it offers simple yet powerful SDK for businesses to integrate Bilpay payment solution to their e-commerce websites.

The architectural design of this payment system will be based on a blockchain instead of the traditional client server architecture.

Rapid prototyping methods will be an essential phase for the development of this project.

Elaboration phase will be a crucial phase of the development of this project. The most critical use cases driving the architectural and planning decisions and also the infrastructure and the development environment will be elaborated.

The construction phase will include coding, verification, unit testing, integration testing and debugging. The construction model will have an iterative approach. Complexity will be minimized by writing simple and readable code as well as creating and using standards for the development.

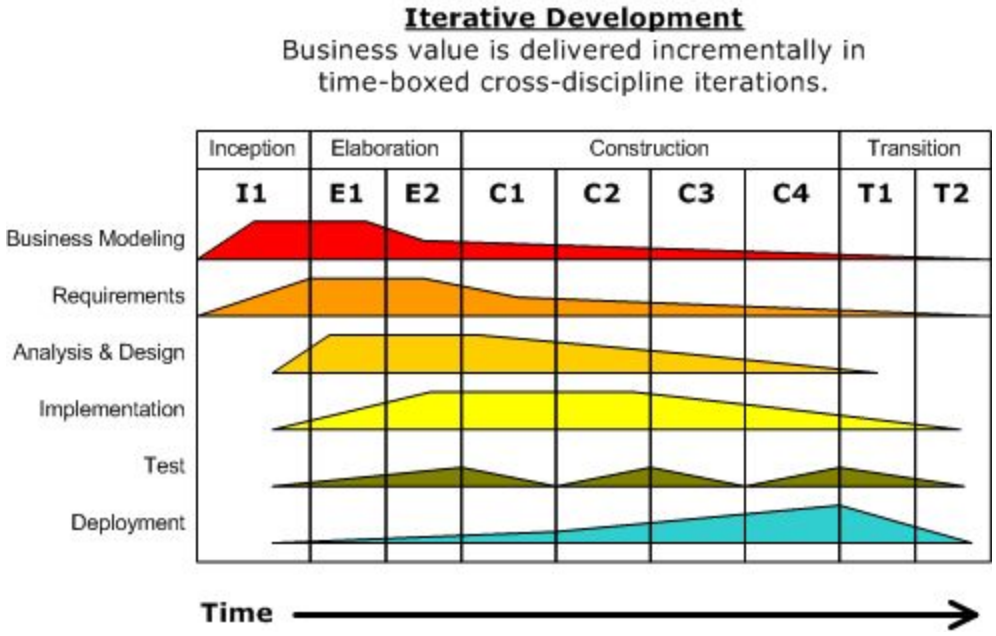
Quality assurance will be done in every iteration.

Product Requirements

- The user should be able to pay e-commerce websites with Bilkash.
- E-commerce owners should be able to integrate Bilpay payment solution to their systems seamlessly.
- Bilkash shall be sent between users with 3 easy steps(find receiver, enter amount, confirm transaction) and the transactions must be settled under 15 seconds.
- The user should be able to sell Bilkash in return for Turkish Lira and buy Bilkash with Turkish Lira.
- All registered users must pass KYC\AML procedures.

- User should deposit or withdraw Turkish Liras with Wire Transfer/EFT
- User should find wallet information(in order to send money) of user via email address, name surname or username.

Software Development Process Model



- Use cases feed the design and Jira stories, which create Bitbucket feature branches
- Review before merging into develop branch. Master updated every 10 workdays
- Feature freeze (FF) following 7 workdays of development. 3 workdays of QA

- Automatic deployments from development, FF and master branches in git to the test, staging and production environments of an AWS Elastic Beanstalk application, respectively.

Project Stakeholders and Organization

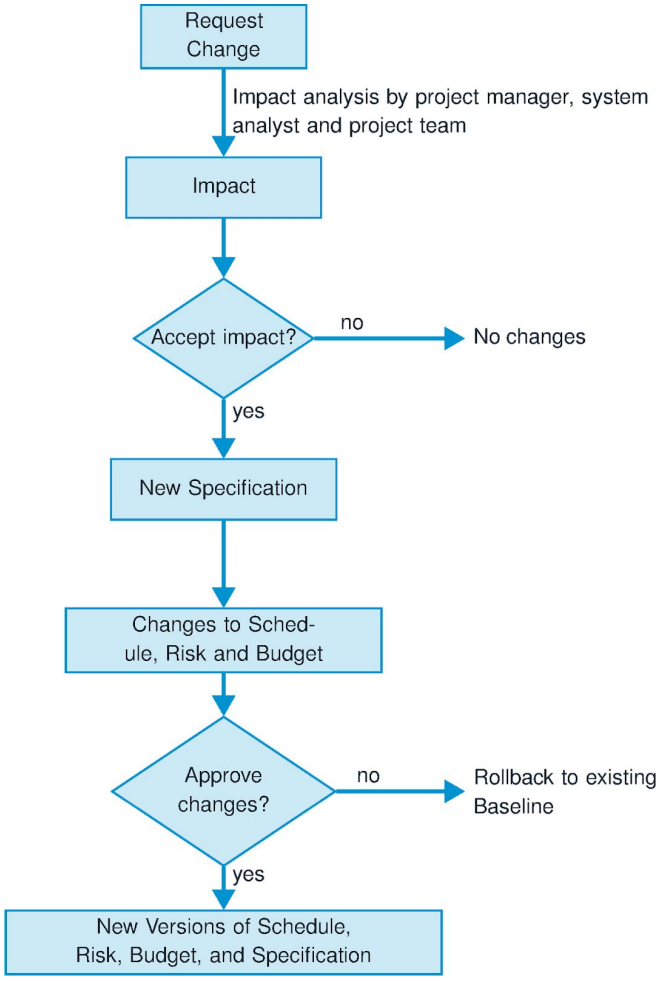
- BarakaTech (Consultancy)
- Masak, BDDK (Turkish Government) (Legal procedures)
- CTIS Department (Supervision)
- Team Members (Requirements Engineering & Development)

Project Communication

- Weekly meeting with BarakaTech
- Google Docs
- Bitbucket
- Jira
- Slack

Project Change Control

- Version control with Bitbucket (Git)
- Backlog management with Jira
- CI\CD with Jenkins
- Applying Change Impact Analysis such as “Impact Analysis Checklist”,”Impact Analysis Template” or “Requirements Change Impact Analysis”.



Milestones and Deliverables

We are moving forward with iterations. During the development, new features will be merged into production every two weeks. Similar procedures will also be applied to the documentation. We can consider end of the inception, elaboration, construction and transition phases of Unified Process as milestones.

Here are the deliverables below.

- Mobile application for the end user.
- SDK for e-commerce businesses.
- Implementing the cryptocurrency payment system.
- Bilkash will be held in global market.

Assumptions

- Legal issues will be resolved flawlessly.
- Suitable conditions will be provided for Masak.
- Software and Hardware requirements will be satisfied in terms of funds.

Constraints

- Providing confidentiality to the users.

- Making a chaincode deployable system.
- Processing transaction in less than 15 seconds.
- Capability of 100 transaction/s system-wide.
- Availability of Blockchain system and SDK webhooks 99% of time.

Risks

Since high-performance permissioned blockchain is a new technology, support could be difficult to find. This risk will be mitigated by the existence of friendly Baraka developers and the open source nature of the blockchains being considered.

Money can be stolen from users wallet or a user may claim that a transaction has been processed without one's will. To prevent repudiation, fingerprint verification (for IOS) or face recognition verification (Only for supported devices & OS) may be required. To be able to intervene the theft, all transactions will be back traceable.