

**4<sup>th</sup> - Semester Exam Project Report  
Of  
Group: 3. INT**

**Project Name: Blockchain  
Spring 2016**



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**We would like to take this opportunity to thank you for your cooperation and support for our Final Exam Project to be completed. Thank you for taking the time to speak with us and helping us in several times.**

**For Gabor Kiss**

**It was a pleasure working with you, and I truly enjoyed learning more about the role and the ENVIENTA™ association. After our cooperation, I am confident that my skills and experiences are a great match for my future opportunity.**

**- Mate Molnar**

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Me (Mate Molnar) and my classmate (Hunor Vadasz-Perhat) shared our experiences about our internships. Envia seemed an entirely new way upon how to look at a community and its actions not to mention the fact that the philosophy and its implementation comes from blockchain - a programmable distributed trust infrastructure. A blockchain is a distributed database that maintains a continuously-growing list of data records hardened against tampering and revision.<sup>2</sup> It consists of data structure blocks where each block holds batches of individual transactions and the results of any blockchain perform the indicated tasks according to the encoded instructions.

The most well known implementation of the blockchain system is bitcoin. Bitcoin is often called the first cryptocurrency - although prior systems existed - or a more precise description would be the first decentralized digital currency. Other implementations of the blockchain system are: banking and trading system, identification, authentication, smart contracts, data verification and a list of other implementations and startups that were built and are maintained by the blockchain system.

Our goal with this project is to make a Blockchain for the school (ZIBAT). This system based on the school as a 'chain', which would like to present one 'block' from the blockchain. That is just the first step. To make it workable it is needed to have three 'chain' in one 'block' at least. Our school system is perfect for this to start and develop this efficacious network.

- ZIBAT - Campus Køge
- ZIBAT - Campus Nykøbing
- ZIBAT - Campus Næstved
- ZIBAT - Campus Roskilde
- ZIBAT - Campus Slagelse

There are five Campuses. They are already in a network. That is true, but we can improve it, to make more connections between them. To make and develop a distributed system. The difference between the existing and the new one, is that the new allows you to make connections or a community with students in an other Campuses. This is not just for the students, it is also for the teachers too. Summing this up, it is a community solution for schools. To make and hold a connection with the others. But this is just the basic what you can do with it.

According back to our idea, we would like to develop a network which will solve some issue/case in the existing system. Moreover with this network the students are able to build personal or public groups inside the system. There is a lot worth in it. This network would be cover the whole Sjælland area and Campus Nykøbing of course. Actually it is could be go further and could be way more and bigger. It is depends of the students and the teachers.

In the (Blockchain) network the system has lots of opportunity. It is allow many possibility for students and teachers.

We also would like to solve real problems or tasks. For example during our studies we experienced some angles which are improvable. We observed that in most of the cases the students don't have any idea about to choosing a topic as a project. We would like to help them and furtherance their wills.

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<sup>2</sup> Wikipedia - Blockchains - [https://en.wikipedia.org/wiki/Block\\_chain\\_\(database\)](https://en.wikipedia.org/wiki/Block_chain_(database))

Our goal with this project is to make a Blockchain for the school (ZIBAT). This system is based on the school as a 'chain', which presents one 'block' from the blockchain. That is just the first step. To make it work it is needed to have three 'chain' in one 'block' at least. Our school system is perfect for this to start and develop this efficacious network.

The best place for this is a community obviously. This community is for the students and the teachers. A place where the people could share their stuffs about everything just like at the market. Yes! It could be a service or a product. In this way the system allows you to share important informations like project details in your personal/public group. Further it is could be a place for community projects or way better and serious things to build like a startup project. It is fit for all of the ideas and wills.

There is a way more in this (Blockchain) community. It also allows you special and exciting solutions and tools. For example cryptocurrency possibility. Imagine that you can pay with this currency at the Friday Bar. It would be nice and easier for everyone, because they are also in the same network with you, so if the currency agreed between you and the bartender there is nothing in the way to pay with it.

### ***0.1.2 Project Management: Hunor***

The primary challenge of project management was to achieve all of the project goals and constraints. The primary constraints are scope, time, quality and budget. The secondary challenge is to optimize the allocation of necessary inputs and integrate them to meet predefined objectives.

In managing project activities careful consideration must be given to overall project objectives, timeline and the roles and responsibilities of all participants.

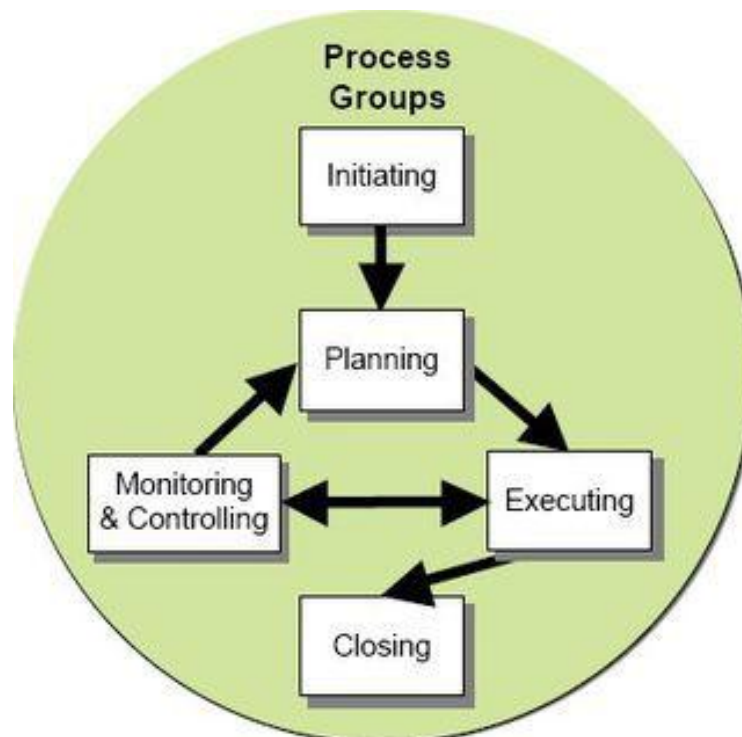
The traditional phased approach identifies a sequence of steps to be completed. In the "traditional approach"<sup>3</sup> the five developmental components of a project can be distinguished as the following:

1. Initiation
2. Planning
3. Production
4. Monitoring and controlling
5. Closing

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<sup>3</sup> Wysocki , Robert K (2013) - Effective Project Management: Traditional, Adaptive, Extreme



Project Development Stages<sup>4</sup>

In a project environment these stages may be supplemented with decision points at which the project's continuation is debated and decided.

## 1. Initiation

The initiating processes determines the nature and scope of the project. This stage needs to be performed well so the needs and goal are met. The key project controls needed here are an understanding of the environment and making sure that all necessary controls are incorporated into the project.

The initiating stage included a plan that served with the goal of encompassing different areas such as:

- a. How To define the problem formulation
- b. How To analyze the project requirements in measurable goals

From a more detailed point of view:

- a. How To define the problem formulation

As Blockchain is getting a broader acceptance and a wider area of implementation and usage in different sectors such as banking, trading, file storage, tracking taxpayer money, online voting<sup>5</sup> etc. after a brainstorming on how we could tackle and possibly come up with suggestions on working and implementing such a system in an another setup willing it be an institution such as a school environment seemed a challenging task indeed. Besides one member of the group (Mate Molnar) had a

<sup>4</sup> Office of Information and Technology - [Project Management Guide](#)

<sup>5</sup> [Computerworld - UK](#)

similar approach at his internship (Envienta) which was partly focusing on the possible implementations of a blockchain system in a school environment.

As a result of our brainstorming and a meeting with our supervisor, Jeppe Rosengren Stockmar our problem formulation has reached its final form. The problem formulation, which we will be focusing on in our report, is aiming at :

- Explaining the main idea of the blockchain system
- Pointing out the advantages and disadvantages of the system
- Presenting a possible implementation at the school environment (Campus Køge) with a prototype
- The problem formulation itself is:

### **The implementation of the Blockchain system in a school environment**

#### b. How To analyze the project requirements and our goals in measurable units

As a result of our meeting with our supervisor teacher we came to the conclusion that coming up with a fully developed solution on how to tackle the problem formulation might go beyond our means in several fronts:

- Time: designing and developing a blockchain system that would fulfill the functionality needs would need more time
- Knowledge: even though understanding the basic principles of the blockchain system can be reached in a fairly easy and empirical way developing a new until now non-existing system is complex and requires more in-depth knowledge
- Resources: hereby it is meant from a more human resource point of view. Such a project would require more human resources with various knowledge of different related fields.

Due to the previous stated above even though our original goal as being an ambitious one namely developing and implementing the blockchain system for Campus Køge needed to be compromised in such a manner that the report and the product we are willing to come up with could fit into the time frame and the report requirements stated in our syllabus.

## **2. Planning**

After the initiation stage, the project was planned to an appropriate level of detail. The main purpose was to plan time and resources adequately to estimate the work needed and to effectively manage the goals during project execution.

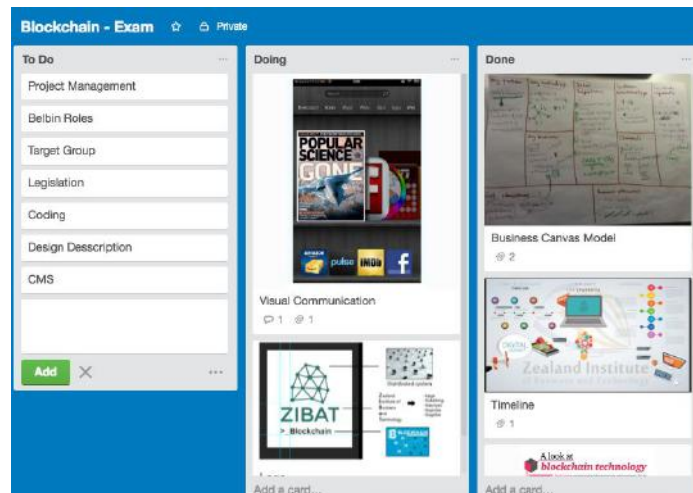
The project planning stage consisted of the following:

- Determining the goals
- Determining the deliverables and the products
- Developing the schedule/time plan
- Developing the budget and what to purchase

- Determining the communication and working platforms
- Identifying the roles and responsibilities

From a more detailed point of view:

- Determining the goals:
  - To describe and explain the basic ideas and philosophy of the blockchain system
  - To design and code a website that is connected to a database
  - To describe and explain the possible implementations of the blockchain system in a school environment
- Determining the deliverables and the products:
  - Report
  - Promotional Videoclip
  - Website created with technologies: Content Management System (CMS), Twitter Bootstrap, Own PC server
  - Building own PC server where the website is online
- Developing the schedule/time plan
  - After a meeting and supervision we started working on a timeplan that contains the overall goals as well as the smaller tasks that need to be fulfilled
- Developing the budget:
  - Our goal is to put together our own PC machine that would function as a server machine for the website
- Determining the communication channels and working platforms:
  - *Skype* - an application that provides video chat and voice call services helped us to keep contact, share documents, ideas and discuss/solve upcoming difficulties
  - *Facebook* - an application that was mainly used to keep contact on a daily basis
  - *Google Document* - a web based collaborative tool where documents can be shared, edited by multiple users simultaneously in real time was a great help in our production
  - *Trello* - a web based project management application that helped to track on our tasks and development



- *Teamviewer* - an application that allowed us to remotely connect to our multiple workstations by desktop sharing and file transfers increased our productivity
- Identifying the roles and responsibilities:  
For identifying the roles and responsibilities we used Belbin's Team Roles Model. Belbin identified nine team roles and he categorized those roles into three groups: Action Oriented, People Oriented and Thought Oriented. Each team role is associated with typical behavioral and interpersonal strengths. Our group consists of two members with different strength and weaknesses on different areas.

### Action Oriented Roles

Shaper (SH) In our team: Mate Molnar

Description:

- Shapers are people who challenge the team to improve. They are dynamic and usually extroverted people.
- Their potential weaknesses may be that they are argumentative and they may offend feelings.

Implementer (IMP) In our team: Mate Molnar and Hunor Vadasz-Perhat

Description:

- Implementers are the people who get things done. They turn the ideas and concepts into practical actions and plans.
- Their potential weaknesses may be that they may be inflexible

Completer-Finisher (CF) In our team: Hunor Vadasz-Perhat

Description:

- Completer-Finisher are the people who see the projects are completed thoroughly. They ensure there have been no errors and they pay attention to the smallest details.
- Their potential weaknesses may be that they worry unnecessarily and find hard to delegate

### People Oriented Roles

Coordinator (CO) In our team: Mate Molnar and Hunor Vadasz-Perhat

Description:

- Coordinators are the ones who take on the traditional team-leader role. They guide the team to what they perceive are the objectives.
- Their potential weaknesses may be that they may delegate away too much personal responsibility

Team Worker (TW) In our team: Mate Molnar and Hunor Vadasz-Perhat

Description:

- Team Workers are the ones who provide support and make sure that people within the team are working effectively. These people fill the role of negotiators within the team and they are flexible, diplomatic and perceptive.
- Their potential weaknesses may be that they may maintain uncommitted positions during discussions and decision-making

Resource Investigator (RI) In our team: Mate Molnar

Description:

- Resource Investigator are innovative and curious. They explore available options, develop contacts and are receptive to them and their ideas.
- Their potential weaknesses may be that they may lose enthusiasm quickly

### **Thought Oriented Roles**

Plant (PL) In our team: Mate Molnar

Description:

- The Plant is the creative innovator who comes up with new ideas and approaches.
- Their potential weaknesses may be that they can be impractical at times

Monitor-Evaluator (ME) In our team: Hunor Vadasz-Perhat

Description:

- Monitor-Evaluators are best at analyzing and very strategic in their approach. They are objective and carefully weigh the pros and cons of all options before coming to decision
- Their potential weaknesses may be that they can be perceived unemotional and react to events rather than instigating them

Specialist (SP) In our team: Mate Molnar

Description:

- Specialists are people who have specialized knowledge that is needed to get the job done. They commit themselves fully to their field of expertise
- Their potential weaknesses may be that they might be led to a preoccupation with technicalities at the expense of the bigger picture

How we used the tool

- To think about team balance before project start
- To highlight and manage interpersonal differences
- To develop interpersonal strengths and manage weaknesses

- To identify areas of conflict and compensate by purposefully adopting a different team role
- To work together on a specific task and acquire new skills

### 3. Production

This stage is the longest one in the project life cycle and it typically consumes the most energy and the most resources. In order to monitor and control the project during the phase we implemented various management processes.

These processes helped us to manage:

- Time
- Risks
- Issues
- Communication

Time management process

- To put in place a process for monitoring the time spent on a task
- To monitor and hold deadlines
- To identify and resolve time management issues
- To keep project plan up-to-date at all times

Risk management process

- To identify and resolve risks
- To reduce the likelihood of risks occurring
- To examine and draw conclusion

Issue management process

- To identify and resolve issues
- To reduce the likelihood of risks occurring
- To examine and draw conclusion

Communication management process

- To communicate our message on ideas, suggestions, disagreements, decisions
- To gather feedback and improve communication process

### 4. Monitoring

Monitoring consists of processes performed for the observation of how the project is being executed in order to identify the upcoming problems so the necessary actions can be taken. The benefit is that project performance is observed to identify variances.

Monitoring includes:

- Measuring the ongoing project = Where are we? - Measurement
- Monitoring the project management plan = Where should we be? - Evaluation
- Identify actions to address issues = How can we get on track? - Correction



The monitoring provides feedback between the different project stages. The aim is to implement the correct actions so the project can be brought back to compliance with the project management plan.

Over the course of any construction project change can occur. Change itself is a normal and expected part of the construction process. Besides making the change in the field the change needs to be documented in order to show what was actually constructed. The monitoring phase provides feedback between other project phases in order to implement actions that are preventive and corrective. The aim is to bring the project into compliance with the project management plan.

In this phase it is important to pay attention to how effectively and quickly problems are solved.<sup>6</sup>

Project maintenance is an ongoing process and it includes:

- Correction of errors
- Updates to the product/service/deliverable in particular

When changes are introduced the project plan needs to be re-assessed. It is important not to lose sight of the overall goals but keep in mind that when change accumulates the expected result may alter as well.

## 5. Closing

Closing is the formal acceptance of the project and the ending itself. This phase consists of:

- Completing and settling all tasks in process
- Finalizing all activities of the process to formally be able to close the project

This is an important phase of the project that makes it possible to learn from all the experiences through the project and apply them to any projects in the future.

Project control is the element of a project that keeps it on-track and on-time. Project control begins early in the project with the planning process and ends with a review having a thorough involvement of each step in the process. Projects were reviewed while the project in progress. Each project should be evaluated for the appropriate level of control: too much control is holding back the process and too little control may risk to reach the goals.

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<sup>6</sup> A Guide to the Project Management Body of Knowledge - <http://www.pmi.org/>

### 0.1.3 Target group: Hunor

A target market is a common tool that is used by marketers and businesses to determine the set of customers they intend to focus on. A target market is defined as a “a particular group of consumers at which a product or service is aimed”<sup>7</sup>.

Defining the target market is the first stage in the marketing process and is a process of market segmentation. Market segmentation can be defined as the division of a market into its groups based upon needs, characteristics and behaviours. Segmentation of the market gives the opportunity to define the target market and to apply the marketing strategies effectively.

#### **Determining the target audience:**

It is important to identify and understand the target audience. To determine the target audience it is vital to identify what problem the product or service solves and what type of needs should be fulfilled. The service or product must determine what kind of people are facing the particular problem. This is based on the information and behaviour of the customer as follows:

- Demographic
- Psychographic
- Geographic

*The demographic information:* it involves aspects such as gender, income, education etc. It provides a basic background of the customers and helps to decide how to communicate effectively. This statistical information does not require in-depth analysis to give an answer.

*Psychographic information:* is based on personality characteristics and includes the personality, lifestyle, social class, motive, value orientation of the customer. It can be done by researching the preferences, likes, dislikes, habits, interests, hobbies and values. Variables are concerned with why people behave the way they do.

*Behavioral segmentation:* identifies what the customers want from the product or service and what benefits they seek. When determining the target audience it is important to examine the consumer behavior trends. There should be selected a segment whose behaviour aligns with the functionality and purpose of the product or service.

#### **Reaching the target audience:**

A successful appeal to a target audience requires a plan which involves different factors in order to achieve an effective marketing campaign.

An effective marketing consists of identifying the appropriate target audience and being able to make the correct marketing strategy to reach them. There has been outlined four strategies to satisfy the target markets.

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<sup>7</sup> [Oxford Dictionary - 2016](#)





There are four key strategies<sup>8</sup>:

- The undifferentiated marketing - (Mass)
- The differentiated marketing - (Segmented)
- The concentrated marketing - (Niche)
- The micro marketing - (Local/ Individual)

*The undifferentiated marketing* is used to capture a whole audience rather than focusing on the differences in the segmented markets. The efficiency of the strategy can be questioned due to the fact that there is a high amount of competition and difficulty in creating a product or service that satisfies the majority.

*The differentiated marketing strategy* is when variations of the product or service are created to target multiple segments of the audience. This type of strategy involves a lot of development and research which are not cost and time effective as well as it requires a range of promotion that is unique to each specific unit.

*The concentrated marketing strategy* makes it possible to create a strong market position. It is beneficial since it does not include a lot of competition. There is a bigger chance to gain more knowledge of the particular segment and it is more focused on the needs of the segmentation that it requires.

*The micro marketing strategy* targets very narrowly. It makes it possible to adjust the product or service and the marketing program to fit the needs of the different segments and niches. It includes both local and individual marketing. Within, there is Local marketing is

<sup>8</sup> Marketing Management - Philip T. Kotler

“tailoring brands and promotions to the needs and wants of the local customer groups, cities, neighborhoods and even specific stores”<sup>9</sup>.

We would see the opportunity for a startup of Blockchain in our campus with the *Micro marketing strategy*: more precisely *Local marketing strategy*. Besides, the marketing would be from a Business to Customer strategy: our reasoning is that when a Business to Customer marketing takes place it is more vital to focus on the benefits of the service/product. Users are different in that they demand a variety of distribution channels for convenience not so with the Business to Business market. Users are less likely to be interested in a lengthy marketing message - users do not want to “work” to understand the benefits instead want the message to be clear and easy to grasp in a short period of time. Therefore we would suggest that there should be a high focus on the benefits and possibilities of the possible implementation of the Blockchain system in a school environment.

Target group share characteristics as the following:

- Students taking a full time daily education in one of the PA or Top-Up programmes offered by Campus Køge
- age : +18
- Campus Køge shares a multinational environment with diversity
- The educators put a great emphasis on encouraging the students for innovation in the form of new startups and entrepreneurship
- For students technology plays a vital role in the daily life on different platforms

A survey was made with the main aim to get to know what the students know about the blockchain (its philosophy, basic functionality and possible usage). The survey itself was a qualitative research in two Campuses (Køge, Næstved) - (For surveys with answers see [appendix](#)).

The survey includes the following questions:

- Age
- Sex
- Education
- Where do you live?
- What are your hobbies?
- Have you ever heard about Bitcoin?
- What is Bitcoin?
- Have you ever used Bitcoin?
- Have you ever heard about Blockchain?
- What is Blockchain?
- Do you follow any technological news?
- What social media do use the most often?
- How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)

The conclusion:

- The interviewees had heard about Bitcoin and had a minimal actual or factual knowledge

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<sup>9</sup> Marketing Management - Philip T. Kotler

- The interviewees had a minimal or no actual and factual knowledge about Blockchain
- The interviewees showed interest in getting to know more about the Blockchain system and its possible usage (after getting a shorter non-technical explanation )
- The interviewees had no experience in using the Bitcoin system and bitcoin itself as a digital currency
- The interviewees mainly use the different social media platforms such as: Facebook, Snapchat, Twitter
- The interviewees mainly use the above mentioned social media platforms on devices such as: Smartphone, Laptops, Tablets

Therefore:

- The marketing should be focusing on delivering a clear message
- The message should clearly point out the practical use and the advantages compared to another system delivering same service
- The content should be clear and easy to grasp. Even though this technology is new and the basics are easy to get on with the deeper understanding and clarification demands time and effort -> this could either eliminated or minimized by interactive presentations for example
- The content should be adjusted to the target group. Whether we are talking about the staff or the students the content should be understood at the level that serves that particular role.

#### **0.1.4 Tools: Mate**

**Website Link:** [Freepik](#)

**Website Link:** [Square Space](#)

**Website Link:** [Materialup](#)

**Website Link:** [Video Blocks](#)

**Website Link:** [Screen-o-Matic](#)

**Software Link:** [Adobe Illustrator](#)

**Software Link:** [Adobe Photoshop](#)

**Software Link:** [Sony Vegas Pro](#)

**Software Link:** [CMS e107](#)

**Software Link:** [Mobirise](#)

**Software Link:** [Pingendo](#)

We used some programs and websites during the project to make some tests and prototypes. Some of them was recommended like the Photoshop or the Illustrator to make our work easier to edit and design the shapes and surfaces. Some of them came up with during our internship and the project as well. Most of the above websites and softwares was very useful and creative for us.

#### **Adobe Illustrator:**

We used a lot, because it is hardy recommended nowadays if you want to get a high quality product, like a logo or a shape. It is a vectorial program so everything will be detailed and smooth like a knife. It is would be handy if you want to design a shape or an element for a website. You can save it for web as well, so your work will be fit for the site perfectly.

The Zibat designs, the topology and the timeline also made with it. The timeline “map” was very nice to design and edit the shapes. Some of the shapes came from the [Freepik](#) website.

We modified to make a good looks for it and also fit the style what we imagined.

### **Adobe Photoshop:**

Mostly we used at the topology. The structure of the image is full HD not higher, so it was fine to make it with the PS. At this time we made all of the material. We collected all the necessary images from the web just to get the picture how to draw Denmark precisely for example.

We also used it when edited the Promo site. We used the [Mobirise](#). But it was a needed thing to edit our images and not to use the already given by the program. Not all of the images made with is, but some of them. Rest is went to the Illustrator branch desk.

The logo also made with the PS, but later we changed the format of it. PNG to SVG. One of the basic "theoretical" advantages of SVG graphics on the web is being able to use one graphics file in multiple locations and multiple sizes on a web page as well as site wide with little or no loss of detail or image quality. In the example below the difference in file size between the vector and raster versions of the image is only 0.41% and the vector version is the larger of the two. Since native SVG support is limited to modern browsers and all fall short of full support of the standard the example below makes use of only the <img /> tag to display the images. If you cannot see the SVG version on your browser you probably need to upgrade to a newer version of it.

### **Sony Vegas Pro:**

We used for the Demo Teaser. A basically easy program with a simple timeline and materials. We are not a professional about the editing, but it was simple to the scenes step by step and make a track for it.

### **CMS e107:**

An open source content management system. It was a surprise for us how easy and simple is that CMS to use. We made our system with this CMS and we are satisfied with the result. Our “test subjects” were also. We recorded them with [Screen-o-Matic](#) program so you can check out what happened during the tests.

### **Mobirise:**

It is a mobile responsive website builder. This program is very cool. Honestly! You can make simple websites with it. Actually, if you want to make a good product you will spend more time for it, just as we did. You could make full screen sites too with the drag&drop function. There are some precoded content, but you also have the chance to make your own.

### **Pingendo:**

Another good tool if you are a designer. Pingendo is a visual desktop application that helps you create prototype responsive web pages based on the popular Twitter Bootstrap framework. Creating your own design from a blank canvas has never been so easy. Drag elements in position, resize and customize, insert your contents.

**Freepik:**

Freepik is the leading search engine of free vector designs. The largest community of graphic designers in the world. Freepik offers users, high quality graphic designs: exclusive illustrations and graphic resources carefully selected by their design team in order to provide to the users with great content that can be used in both personal and commercial projects.

**Square Space:**

We made the logo with it. Actually the logo design is not needed to be fancy. The blockchain has a style so we just follow it to make it simpler. It is following the flat design so it is not difficult to just make a formal logo.

**MaterialUp:**

This site is also a useful tools for the designers. You will find your own style, because the site is full of material like GIF-s and Vector graphics. They made for sites and promotions so all of them is useable and buyable. Well, yes that is the opposite of the site. You can not download anything without a payment. But most and relevant types of it are free. You also have the chance to upload your stuff to share with somebody or just to earn some money. Actually the site is part of the <sup>10</sup>“gig economy”. So we used that site too. To get some idea and visual example to design our project. Those collection was very useful to figure out the nowadays style and trends.

**VideoBlocks:**

We used that site when we edited the Demo Teaser for our project. That was the site from we downloaded the stuff what we used during the work with [Sony Vegas Pro](#). It was the best solution, because we saved lots of time instead of recording the scenes. We also figured out that, most of the trailers on the internet made with it. For example the ‘documentary movies’ or the ‘low budgets’ based movies. So, it was nice and good experience what we learned from this part, how is going that in the real world.

**Screen-o-Matic:**

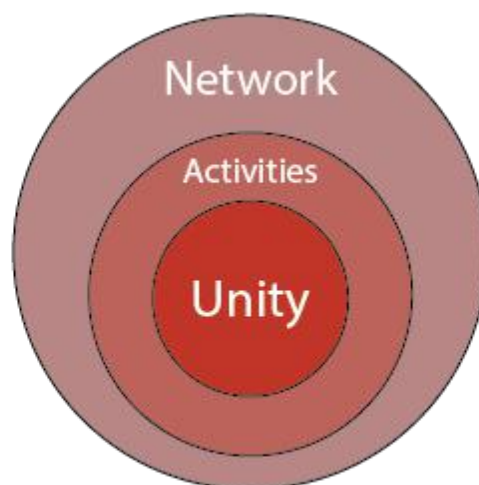
This program is would be handy when you want to test a product in front of a computer. You record the “*Test subject*” how he/she will react each of the parts. You can analyse the feedbacks, because this program also record the user voice and activity. So you can watch the “*Test subject*” face and his/her movement at the same time. It is much easier and faster to make a test like this. So, it is a good choice if your product is online and you want to develop the service.

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<sup>10</sup> A gig economy is an environment in which temporary positions are common and organizations contract with independent workers for short-term engagements.

### 0.1.5 3 ring target: Mate

Image Link: [Three Ring Target](#)



1. **Unity** - Our first value is the 'unity'. As a Blockchain community we think about in units. These units are the "*chains*" in a block. The blocks are the grid and this place will be the home of the core. The users are the main reasons in the system, without them it is just machine. As a core they have the control and they know how to drive this unity. It is very important to divide two thing here. Basically in the real life we already have a membership in a group or at our work, but here is different a little bit. Here you do not have any border so you can make your own service and that is it. That is the core the heart of the project. You do not need the other permission to make your own part in the system, everything is given for you already.
2. **Activities** - Our second value is the 'activities'. The system allows you to make your own way, that means you can create your own service and you will able to make a market for example. The others can join into your "*company*" and you could hire them to work together. So, this part is depends on you, but just if you want. Nobody force you to make something after you joined. It is depends on you what you want to share with the others and also you have the chance to get from the them. We can call this

'activity' as a trade as well, and this "*trading movement*" works like a blood in the veins. So, we can say that it is a system-movement.

- 3. Network** - Our third value is the 'network'. The whole process need to be works in a system like any other system do. Well, our system is powered by the Blockchain technology and all of it's features. It depends on the users what they want to use or create inside the network. The technology is given. The network is distributed so body will not be a boss just at his/her service or market. But the others also have the chance to change this if they think that not fair what the owner is doing. In a nutshell you have "*rights*". The system protect you and your privacy, you do not have to worry about your stuff in the system. You also have your voice if you want to change something. The network is expandable, that is obvious. It is could be a global "*network*" or just a "*school*" network. So it is depends on the users again.

### 0.1.6 Value creation for client, users and potential partners: Mate

Image link: [Blockchain\\_Payment\\_Method](#)



#### **Blockchain: a short-lived illusion or a real game changer**

Blockchain has traditionally been a subject of mitigated opinions, due to its early association with bitcoin, the cryptocurrency adopted by techies all around the world, and also used on anonymous markets on the web. As the potential of blockchain is slowly being discovered, it is now getting the full attention of the banking and technology industries. Many major financial and technology organisations are exploring its benefits.

For example, more than 40 international banks are part of R3, a New York City-based consortium assembled in 2014 and designed to produce research and development on the usage of blockchain in a financial environment. In December 2015, the not-for-profit, Linux

Foundation, launched the 'Open Ledger Project', an open-source project bringing together IBM, Cisco, Intel, the London Stock Exchange, and many other organisations striving to build a cross-industry open standard for distributed ledgers.

At the same time, the financial messaging company, Swift, introduced a blockchain-based service for business-to-business payments. Other organisations are also already offering services based on blockchain technology, such as Nasdaq, the stock exchange, and Ripple.

Blockchain is said to have the potential to revolutionise payments by making them faster, cheaper, and safer. However, it also raises a number of issues. What is needed to progress on blockchain and make it a reality? Is it even desirable to expand the use of blockchain to the financial industry? In other words, is blockchain a short-lived illusion, or does it have the potential to be a real game changer?

To shed some light on the topic, the European Payments Council (EPC) gathered six experts from big name companies in the banking (ING), processing (Equens) and consulting (BCG) industries, as well as disruptive financial organisations (Fidor Bank, Bitpay) and a central bank (Banco de España) to attempt to answer this question.

### **A very promising solution**

All the speakers agreed that blockchain is a truly innovative technology that has real potential for the payments market. According to Kaj Burchardi from the BCG, the distributed ledger (which is a distributed record-keeping system where independent nodes hold the same version of the ledger record) presents some interesting value-creating opportunities. The group of experts articulated these as:

- 1. Cost reduction** - The increased automation and reduction of manual processes enabled by blockchain reduces costs.
- 2. Faster processes** - By removing third parties (i.e. automated clearing houses in the use case of payments), delays are reduced. "The expansion of the web 2.0 and social media substantially changes the global landscape. In 2020, it is probable that two billion people will be digital experts. The financial services industry needs to take advantage of this opportunity in order to meet consumers' expectations for fast and efficient remittances. Technologies like blockchain give the impression that payments are faster. In this perspective, and as everybody is trying to improve payments, blockchain is already a game changer", explained Michael Maier, from Fidor Bank.
- 3. Standard creation** - Blockchain has the potential to create new protocols and norms, in coordination with regulators.
- 4. Authentication and security** - "Blockchain protects your data and maximises security", affirmed Marcel Roelants from Bitpay (a bitcoin payment service provider - PSP). With blockchain, each individual holds a unique key, composed of a private part (proof of ownership) to create new transactions, and a public part to verify transactions. If the owner of the transaction wishes to share the proof of ownership, they have to share the private key with other parties. Marcel Roelants carried on: "Blockchain can therefore validate transactions and proof-of-ownership, while enhancing security by reducing reliance on a central ledger." "With blockchain, as



everyone has the complete copy of the ledger in the network, a hacker would have to hack 51 percent of the chain to change transaction entries”, explained Kaj Burchardi.

5. **Creation of new production and channels** - Blockchain could bypass existing marketplaces whilst leveraging novel distribution channels.

### **Use cases for blockchain are growing and are not limited to payments**

These assets demonstrate that the use of blockchain could extend beyond payments. According to Mark Buitenhok from ING, “Blockchain has a huge potential. It could have a significant transformative effect in situations where complex information streams come together – such as in the financial sector (trade finance and securities, for instance).

Anywhere in which there are complicated exchanges, numerous information flows, a large number of parties involved and a lack of trust amongst those parties, it can potentially simplify the incumbent business model, reduce costs and speed up performance.” The most promising use is contracts recording. Blockchain can prove that a contract was agreed between two parties without having to reveal the details.

This would be especially helpful in countries and situations suffering from institutional weaknesses, for example to record real-estate contracts. However, blockchain would not be of much use in situations that are already highly standardised and working well, such as SEPA payments.

### **Blockchain raises a number of issues**

Although blockchain won most of the votes during the debate, one dissonant voice was heard: Michael Salmony, from Equens. He acknowledged that blockchain is a fascinating technology and that any responsible organisation should look at it, but insisted that we must be careful with the hype around it. “Blockchain is currently a solution looking for a problem.

Payments are also much more than just a ‘ledger’, thus the hope of sweeping away the whole payment system with a cryptographic algorithm does seem a bit optimistic. It should also be noted that distributed, safe, scalable, trusted solutions to ledgers (aka distributed databases) have been around for a long while. Blockchain still has to prove these attributes before a critical infrastructure like payments should be built on it.

Most importantly, we should not start from a technology: we should look at the customers, see what problem they have, and then identify which technology could solve it.” *Most speakers, however, agreed that if blockchain is not yet a game changer, it definitely has the potential to become one. A number of questions must first be answered to allow it to fully reap its benefits.*

1. **Can Blockchain handle our current transactions volume (?)** - Blockchain is, for the moment, a small scale network. Its scalability to cope with, for example, the 35 billion transactions occurring in SEPA every year is not yet proven.
2. **What about the hidden costs of blockchain (?)** - Carlos Conesa, from Banco de España, warned against the hidden costs of bitcoin’s blockchain: “Though blockchain is a very innovative solution, some of its supposed advantages, such as

disintermediation, cost reduction, and the fact that trust is no longer needed, are, at best, inexact.” For instance, the transactions’ verification is very energy-intensive: the energy consumption of the current bitcoin’s blockchain is higher than Google’s. On top of that, new intermediaries - requiring trust - appear as blockchain is developed, and converting bitcoins into sovereign currency can be very costly.

3. **How private can, and should, the data be (?)** - PSPs are highly bound to Know Your Customers (KYC) requirements. Some blockchain enthusiasts believe that blockchain could be a way to pool the KYC fulfilments among all PSPs: one PSP could fulfil the KYC requirements for a given customer, and trace them in the distributed ledger. Other PSPs wouldn’t, therefore, have to fulfil them as well. Whether compliance with KYC requirements would be easier with blockchain is however an open question. “How will we manage privacy and ensure transparency at the same time?” asked Marc Buitenhek from ING.
4. **Is blockchain really safe (?)** - Many security issues have appeared at the fringes of the system, for instance, in the wallets and exchanges. In addition, blockchain is still used today on anonymous markets that represent a threat to public safety.
5. **How can create standardisation (?)** - Without cooperation among PSPs, there cannot be interoperable blockchains, and they cannot be used on a large scale. PSPs must therefore collaborate to progress on blockchain, in a manner that still needs to be defined.
6. **What should the role of the regulators be (?)** - To make blockchain a success for payments on a large scale, regulators should have their say in the status of blockchain transactions and the standards that they should use, such as ISO 20022. ING and other Dutch banks have, therefore, involved the Dutch National Bank in the research they are currently undertaking on the potential of blockchain. The Bank of England is also one of the most open-minded central banks on the topic, and acknowledged that the [“distributed ledger technology represents a fundamental change in how payment systems could work”](#). [Carlos Conesa recalled that](#) “At first, many regulators showed disbelief, suspicion and neglect towards blockchain, sharing their concerns about security and anonymity, the lack of supervision and oversight, and even its potential impact on financial stability. An increasing number of central banks are now past this phase, and are analysing the potential of blockchain, having disassociated it from cryptocurrency”. Other speakers pointed out that blockchain could indeed offer central banks the possibility of monitoring money flows in real time, controlling the transactions more accurately, and acting in real time.

All opinions considered, isn’t the fact that banks are led to call their own practices into question the main asset of the blockchain hype? Stefan Dab from the BCG, who was moderating the debate, summed up an opinion shared by several speakers: “Blockchain is a game changer to the extent that it compels the banking industry to think differently and to consider major changes to improve its processes and services, even if in the end, blockchain proves not to be the new technology used.

”Though the general sentiment on blockchain is positive - all speakers agreed that it cannot be ignored and is here to stay, even beyond the payment application - it is not necessarily

considered to be the panacea in the long run. PSPs still need to take a closer look at it, in order to determine if it can be a real game changer. The banking industry should start with the customers' needs, and then see how a technology, whether it is blockchain or another one that might supplant it, could then serve these needs.

### ***0.1.7 Design thinking - Idea and Concept Development: Mate***



### **Extensibility of Blockchain Technology Concepts**

Blockchain technology can potentially unleash an important element of creativity and invention in anyone who encounters the concepts in a broad and general way. This is in the sense that it is necessary to understand the new ideas separately and together. These include concepts such as public-key and private-key cryptography, peer-to-peer file sharing, distributed computing, network models, pseudonymity, blockchain ledgers, cryptocurrency protocols, and cryptocurrency.

This calls into question what might have seemed to be established definitions of traditional parameters of the modern world like currency, economics, trust, value, and exchange. It is a requirement and twenty-first-century skill set to understand these concepts in order to operate in the blockchain technology environment. When you understand the concepts involved, not only is it possible to innovate blockchain-related solutions, but further, the concepts are portable to other contexts.

This extensibility of blockchain-related concepts may be the source of the greatest impact of blockchain technology as human agents understand these concepts and deploy them in every venue they can imagine. The Internet was a similar example of universality in application and extensibility of the core technology concept; it meant that everything could be done in a new way—quicker, with greater reach, in real time, on demand, via worldwide

broadcast, at lower cost. Blockchain technology is rich with new concepts that could become part of the standard intellectual vernacular and toolkit.

### **Fundamental Economic Principles: Discovery, Value Attribution, and Exchange**

One broad way of thinking about the use of blockchain concepts is applying them beyond the original context to see ways in which everything is like an economy, a market, and a currency—and equally important, how everything is not like an economy. This is a mindset that requires recognizing the fundamental properties of economics and markets in real-life situations.

Blockchain technology helps elucidate that everything we see and experience, every system in life, is economics to some degree: a system for allocating resources. Furthermore, systems and interactions are economics in that they are a matter of awareness and discovery, value attribution, and potential interaction and exchange, and may include a mechanism for this exchange like a currency or token, or even a simple exchange of force, energy, or concentration (as in biological systems).

This same basic economic structure could be said to exist universally, whether in a collaborative work team or at a farmers' market. The quantized structure of blockchain technology in the form of ledger transaction-level tracking could mean higher-resolution activity tracking, several orders of magnitude more detailed and extensive than we are accustomed to at present, a time at which we are still grateful for SKU-level tracking on a bill of materials.

Blockchain tracking could mean that all contributions to a system by all involved parties, no matter how minute, can be assessed and attributed in a seamless, automated way, for later roll-up to the macro level—or not, because some community value systems might dictate not having user contributions explicitly tracked.

The ethos and morality of tracking is a separate and interesting social-science topic to explore in the blockchain studies research agenda more generally. However, one way that the blockchain-based capacity for tracking could work is in the form of a “GitHub + Bitcoin” concept, for example, that tracks code contributions line by line over all revisions of a software code corpus over time.

This is important, because economically savvy rational agents participating in the system (i.e., currently humans) want to assess the contributions they and others have made, and have these contributions tracked and acknowledged for remuneration, reputation, status garnering, and other rewards.

### **Blockchain technology could be used in the administration**

What the blockchain could facilitate in an automated computational way is one universal, seamless model for the coordinated activity of near-infinite numbers of transactions, a universal transaction system on an order never before imagined for human activity. In some sense, blockchain technology could be a supercomputer for reality.

Any and all phenomena that can be quantized (defined in discrete units or packages) can be denoted this way and encoded and transacted in an automated fashion on the blockchain. Blockchain venture capitalist David Johnston's summary and prognostication of this dynamic is that anything that can be decentralized will be, showing his belief in the inherent efficiency and benefit or superiority of the blockchain model. Decentralization is "where water goes," where water flows naturally, along the way of least resistance and least effort. The blockchain could be an Occam's razor, the most efficient, direct, and natural means of coordinating all human and machine activity; it is a natural efficiency process.

### **Blockchain layer could facilitate big data's predictive task automation**

As big data allows the predictive modeling of more and more processes of reality, blockchain technology could help turn prediction into action. Blockchain technology could be joined with big data, layered onto the reactive-to-predictive transformation that is slowly under way in big-data science to allow the automated operation of large areas of tasks through smart contracts and economics.

Big data's predictive analysis could dovetail perfectly with the automatic execution of smart contracts. We could accomplish this specifically by adding blockchain technology as the embedded economic payments layer and the tool for the administration of quanta, implemented through automated smart contracts, Dapps, DAOs, and DACs.

The automated Blockchain Technology Is a New and Highly Effective Model for Organizing Activity | 29 operation of huge classes of tasks could relieve humans because the tasks would instead be handled by a universal, decentralized, globally distributed computing system. We thought big data was big, but the potential quantization and tracking and administration of all classes of activity and reality via blockchain technology at both lower and higher resolutions hints at the next orders-of-magnitude progression up from the current big-data era that is itself still developing.

### **What are DAO's and DAC's (?)**

That is a good question and it remains to be comprehensively answered. Even within the wider crypto- community, the spaces between the buzzwords "Decentralised applications" ("DAs"), "Smart Contracts", "Decentralised Organisations" ("DOs"), "Autonomous Agents", "Artificial Intelligence" ("AI"), "Decentralised Autonomous Organisations" ("DAOs"), and "Decentralised Autonomous Corporations" ("DACs"), are grey. Before we can even agree on definitions, questions such as "Is Bitcoin a DAO?", "How do humans fit into the picture?" and "Are we creating the next <sup>11</sup>Skynet?" are being thrown into the picture. Where can we find clear information? Who's thoughts can we look to for guidance? Specialists in the field have each taken their own approach; I've found <sup>12</sup>Vitalik Buterin's and <sup>13</sup>Daniel Larimer's thoughts

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<sup>11</sup> Skynet is a fictional conscious, gestalt, artificial general intelligence (see also Superintelligence) system that features centrally in the Terminator franchise and serves as the franchise's main antagonist.

<sup>12</sup> Vitalik Buterin (Russian Language Виталик Бутерин) is a programmer & writer. He is primarily known as a co-founder of Ethereum, and as a co-founder of Bitcoin Magazine. In 2014, Buterin won the World Technology Award for the co-creation and invention of Ethereum.

<sup>13</sup> Daniel Larimer - [LinkedIn - Profile & Summary](#)

to be exemplary, they are laying the foundations from which these ideas of DAOs will develop in the future.

What has become apparent in the process of researching DAOs and DACs is that the boundaries between them remain to be drawn. But whilst these classifications are not definitive, any crypto-buff worth his salt should be familiar with what the underlying concepts that drive DAOs are.

### **First, let's introduce (or refresh) a few terms**

Smart Contracts: The simplest form of decentralised automation, agreements between a finite number of parties are automatically executed by a computer programme when certain conditions are met. In this case, they are executed on the blockchain by the Bitcoin Protocol.

Autonomous Agent: Software entities that carry out a set of tasks autonomously, a commonly cited example is a computer virus. These agents exist on a spectra of "intelligence" ranging from simple, single purpose entities to fully fledged (currently fictional) AI.

Internal capital: Any property of value that exists within the control of an organisation that can be transferred to other parties. Can be physical (like inventory) or virtual (bitcoin). The existence of internal capital is what defines a DAO in relation to DA.

Decentralised Application: A group of entities that interact with one another according to a protocol on a decentralised network. An example of this would be BitTorrent. The important point to remember about DAs is that they do not control internal capital.

Decentralised Organisation: An organisation of humans interacting with each other under a certain set of rules specified in code (on a blockchain). Imagine a bog standard, shareholder-owned company that exists on a blockchain instead of the ASX. Its existence and ownership structure are what become decentralised. At this point it is important to note that at this point there is no automation. Humans are still making all the decisions as to what the organisation does and how it behaves.

The concept of a DO is a good starting point for moving onto DAOs and DACs. The magic ingredient to introduce is autonomous agents. Create these entities to make decisions instead of a human management and we're in the realm of distributed autonomous organisations. They can now tick on without the need for human intervention. However, a DAO is also defined by the continued presence of humans interacting with the DAO on the edges of its operations.

The DAO, unlike an AI, depends on human inputs and requests for it to initiate action. The DAO is in this sense reactionary, springing into life when a smart contract is set or executed. Without this input from human agents, the DAO will cease to perform tasks. Obviously, the variable here to adjust is the autonomous agents degree of "intelligence". As this increases, we shift away from a DAO into the realm of AI, where the entity will continue performing tasks in the absence of human input.

*“DACs are the equivalent of exchange-listed companies that pay a dividend, however, the blockchain replaces the exchange and the dividend is in the firm of a virtual asset.”*

Finally, we can get to DACs. A distributed autonomous corporation is a subset within distributed autonomous organisations, all DACs are DAOs, but not all DAOs are DACs. The defining feature of a DAC is that it is profit driven. DACs are the equivalent of exchange-listed companies that pay a dividend, however, the blockchain replaces the exchange and the dividend is in the firm of a virtual asset. Stakeholders are entitled to a share of the profits generated by this autonomous entity, and can enter or exit the investment at any time.

Hopefully, this has clarified the distinctions between DAOs and DACs with everything that makes them tick under the hood. The incredible thing is that DACs have ceased being theoretical concept and already exist in reality. Online casinos and gambling sites such as Satoshidice display all the properties of a DAC, and are continually developing. The introduction of platforms like Ethereum can only accelerate this development further. The future is upon us already, and nobody has even batted an eyelid.

### The source of our inspiration

## Schools are using bitcoin technology to track students

Luke Graham | @LukeWGraham  
Monday, 9 May 2016 | 10:20 AM ET



Source:

<http://www.cnbc.com/2016/05/09/schools-are-recording-students-results-on-the-blockchain.html>

## How Bitcoin Brought Electricity to a South African School

Stan Higgins | Published on March 9, 2016 at 21:30 BST

FEATURE

Source: <http://www.coindesk.com/south-african-primary-school-blockchain/>

## Bitcoin to be accepted by university for fee payment

The University of Cumbria has become the first UK institution to accept Bitcoin for the payment of tuition fees

January 21, 2014



By [Chris Parr](#) Twitter: [@ChrisParrTHE](#)

Source:

<https://www.timeshighereducation.com/news/bitcoin-to-be-accepted-by-university-for-fee-payment/2010698.article>

## 2. 0.2 BlockChain

- 
- > **Business-Model-Canvas-G** > **Value-creation-for-the-client,-users-&-potential-partners-G**
  - > **DT-Research** > **DT-Analysis**
- 

### 0.2.1 Blockchain Description:



**Image link:** [Blockchain](#)

**Website link:** [Higher\\_Education\\_With\\_Blockchain](#)

The blockchain is seen as the main technical innovation of bitcoin, where it serves as the public ledger of all bitcoin transactions. Bitcoin is peer-to-peer, every user is allowed to connect to the network, send new transactions to it, verify transactions, and create new blocks, which is why it is called permissionless. This original design has been the inspiration for other cryptocurrencies and distributed databases.

A block chain or blockchain is a distributed database that maintains a continuously-growing list of transaction records hardened against tampering and revision. It consists of data structure blocks which hold exclusively data in initial blockchain implementations, and both data and programs in some of the more recent implementations with each block holding batches of individual transactions and the results of any blockchain executables.



With this technological solution which based on this new database we have the chance to rewrite everything. The technology concept behind the blockchain is similar of a database, except the way you interact, this database is different in a way that the part of the information stored (its "header") is public.

The data stored can be a token of value, or a crypto money balance. So, the blockchain acts as an alternative value transfer system that no central authority or potentially malicious third party can tamper with (because of the encryption process).

Bitcoin as a form of digital currency was created on the philosophy and technology of blockchain itself. In the following, we will describe bitcoin in short to give a better understanding of the blockchain system and its possible uses, implementations in our everyday life.

### **0.2.1.1 The birth of bitcoin**

The basics of Bitcoin were put down in 2008 October in an article which was written and put on the internet by Satoshi Nakamoto. The main aim of the article was to describe how it would be possible to create a digital payment technology that provides a fast and secure transfer but would work without a financial intermediaries.

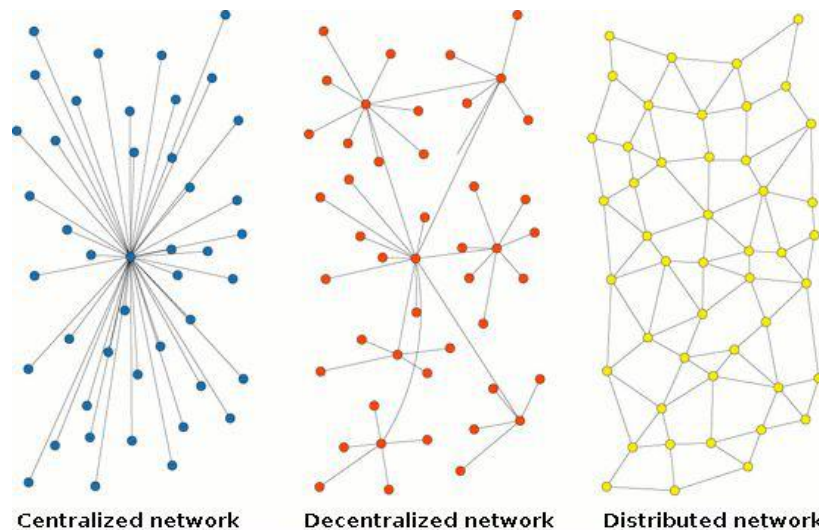
Due to the fact that the financial transfers can be costly and are based upon the trust on a third party it seemed necessary to create a new system. In order to prevent abuse and fraud the third parties collect more information about the customers that would be necessary for the transaction - furthermore transactions with smaller amounts are limited. Processing and storing this information will further increase the cost of transactions.

The authors saw the development of a system as a solution that does not build trust placed in the mediation but on elementary calculations and cryptography that leaves the validation to the multitude of transactions of a peer-to-peer network.

### **0.2.1.2 Peer-to-peer network**

The peer-to-peer (P2P) networking systems based on equal cooperation between participants. The idea of the network is that the endpoints communicate directly with each other without a special central node (server). The P2P networks compared to client-server connection operate differently:

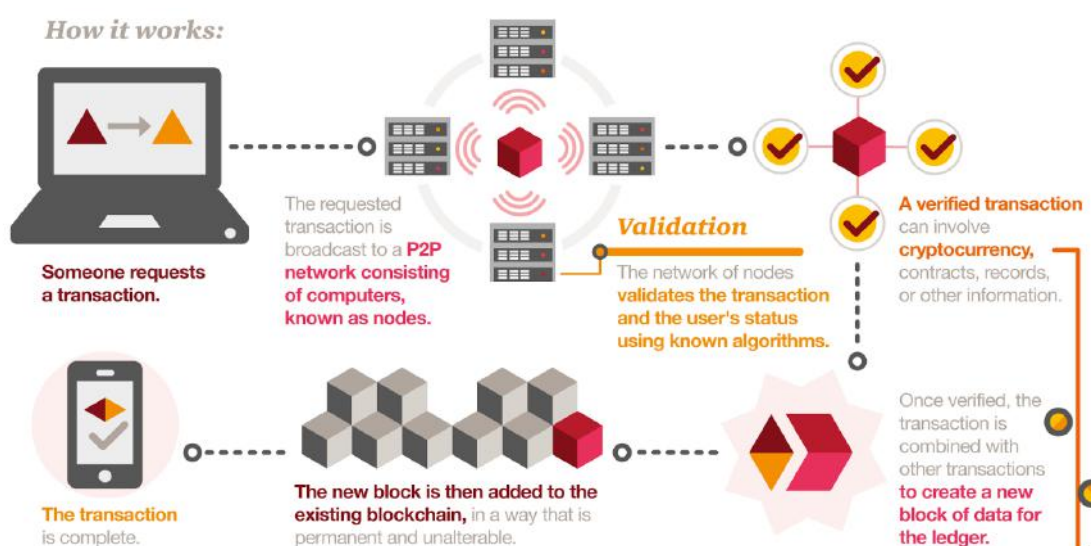
- The roles are not defined
- It is usually a requirement that all participants should make some resources available in return to the use of the system



They mostly operate simultaneously, so the individual nodes can simultaneously act as a server or a client to a participant. Prominent actors are not needed. The system shows a high degree of stability when each node maintains a relationship with only a limited number of other nodes. This operating mode is not new: the so called “ancient-Internet” functioned exactly the same way.

### 0.2.1.3 The principle of bitcoin transactions

The basic unit of the electronic paying method was defined as a chain of digital signatures. Each owner sends one unit by putting his own digital signature that derives from the previous transaction and the public key of the next owner. Afterwards each owner can identify himself with his own key. This ensures the right party will get the money. One issue is yet to be solved: namely that the owner can not control and check if the same transaction was sent more than once.



PwC network - <http://www.pwc.com/gx/en/about/corporate-governance.html>

The solution could be a central control server - a data structure that is public and provides an accurate chronology so most of the actors in the network are the same at particular time. This method on a multi player market provides security because it is highly not possible to obtain an alternative majority if the same transaction list is available to all the actors.

#### **0.2.1.4 The principle of the network**

In order for such a system to transmit financial transactions a network should be built in the following way:

- All the actors in the network gets the new transactions
- All the actors create blocks for the transactions and try to solve the problem of proof-of-work
- The actor who is first to create his own block sends his block to everyone as a new element of the blockchain
- The actors will only accept the block if the chronology of all the transactions are included
- The actors show their acceptance when they start building upon the block by new transactions that are put into blocks

#### **0.2.1.5 The stability of the network**

One question is how secure such a system can be. Let us take an example to illustrate the problem: what would happen if an actor (a possible threat) would like to create a chain with a longer history to gain advantage against the others. It could seem as virtual counterfeiting of money. It is important to look at the possible consequences. First of all the such a threat and attack:

- Would not change the structure of the system
- The actors would not accept the false transactions
- Therefore the actor as a threat could not create new money in the system

The only thing could happen is that the history of the transaction could be changed by the actor as threat. but it would be only worth if the actor as threat could make his own transaction disappear: in other if he could “steal back” the money that has been transferred already.

#### ***0.2.2 Proof of work:***

At the heart of a blockchain’s operations is the key concept of “proof-of-work,” an integral part of Satoshi Nakamoto’s original vision for the blockchain’s role as the unequivocal authenticator of transactions. The “proof of work” is a “right” to participate in the blockchain system. It is manifested as a “big enough hurdle” that prevents users from changing records on the blockchain without re-doing the proof of work. So, proof of work is a

key building block because it cannot be “undone,” and it is secured via the strengths of cryptographic hashes that ensure its authenticity. But proof of work is expensive to maintain (estimated cost of \$600M per year for bitcoin), and may run into future scalability and security issues because it depends solely on the miners’ incentives, which will be declining over time.

An upgraded solution is “proof-of-stake,” which is cheaper to enforce but more expensive and more difficult to compromise. Proof of stake not only determines who gets to update the consensus, but it also prevents unwanted forking of the underlying blockchain.

### 0.2.3 What is a ‘Blockchain’:

A blockchain is a public ledger of all Bitcoin transactions that have ever been executed. It is constantly growing as ‘completed’ blocks are added to it with a new set of recordings. The blocks are added to the blockchain in linear, chronological order. Each node (computer connected to the Bitcoin network using a client that performs the task of validating and relaying transactions) gets a copy of the blockchain, which gets downloaded automatically upon joining the Bitcoin network. The blockchain has complete information about the addresses and their balances right from the genesis block to the most recently completed block.



## 1 HOW BITCOIN WORKS IN 5 MINUTES<sup>14</sup>

The blockchain is seen as the main technological innovation of Bitcoin, since it stands as proof of all the transactions on the network. A block is the ‘current’ part of a blockchain which records some or all of the recent transactions, and once completed goes into the blockchain as permanent database. Each time a block gets completed, a new block is generated. There is a countless number of such in the blockchain. So are the blocks

<sup>14</sup> How Bitcoin Works in 5 Minutes (Technical) - <https://www.youtube.com/watch?v=I9jOJk30eQs>

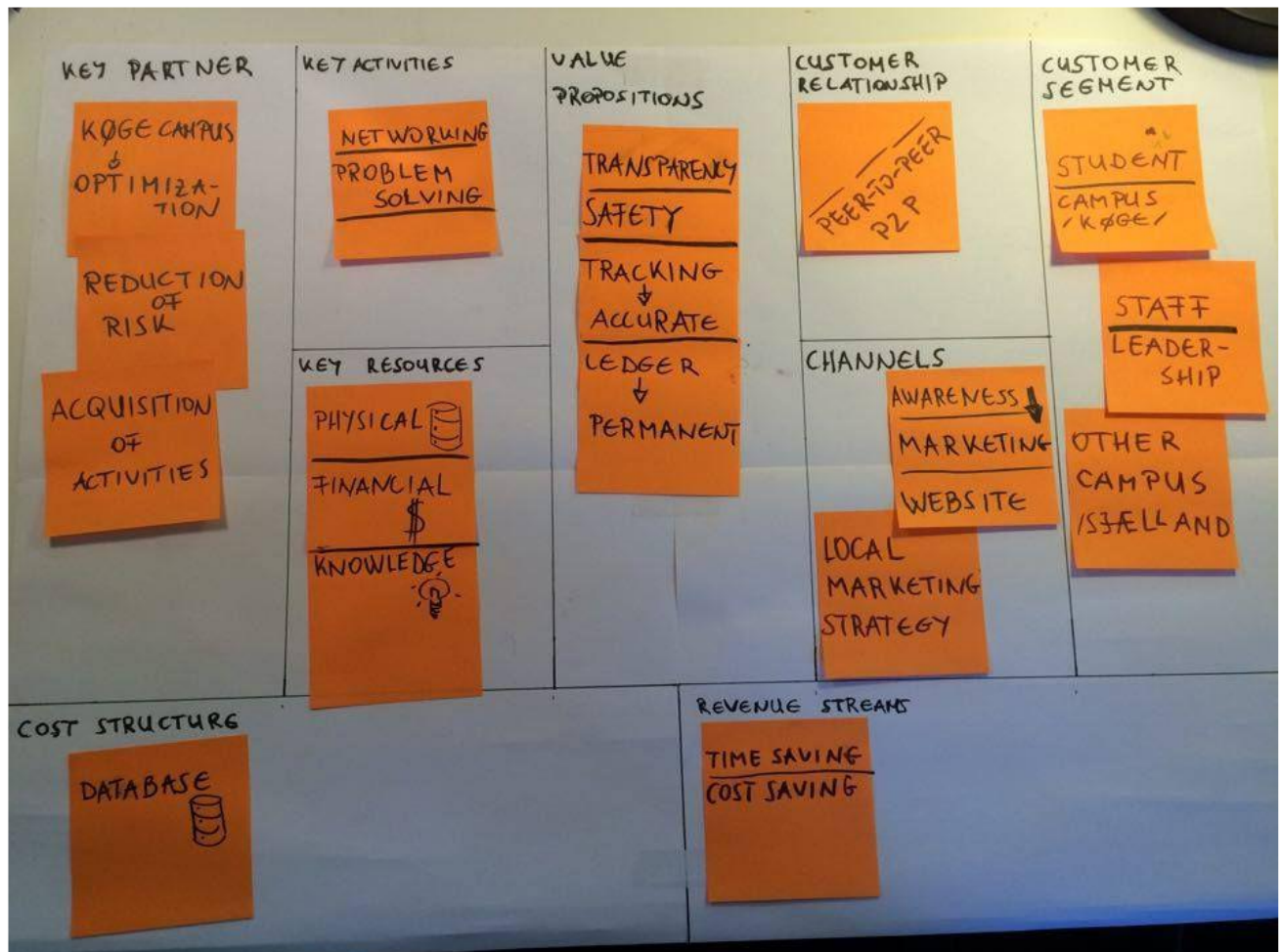
randomly placed in a Blockchain they are linked to each other (like a chain) in proper linear, chronological order with every block containing a hash of the previous block.

**1.0.1 Business Canvas Model: Hunor**

The Business Model Canvas was used as a strategic management and startup template for developing new or documenting existing business models. In the Business Canvas Model we were focusing more on the intersection between the product idea and business value rather than the business value of the product.



Business Canvas Model - draft (See Appendix)



### Business Canvas Model

**Key partners:** the motivations for partnerships are: optimization, reduction of risks or acquisition of activities.

**Key activities:** they key activities the value propositions require are networking, problem solving, start-ups (entrepreneurship).

**Key resources:** the types of resources for the value propositions require are: physical (databases), financial, knowledge, human.

**Value propositions:** looking at what we would like to deliver to the users and what kind of problems we are trying to solve are the following: increased transparency, accurate tracking, permanent ledger, cost reduction, newness, accessibility, safety, time saving.

**Customer Relationships:** the type of relationship each of our user would establish and maintain with the service and each other comes from the basic structural functionality which is peer-to-peer - based on the database structure.

**Channels:** regarding the channels that define how we reach the users firstly we would like to make a website with a promotional aim that would help the users to get a grasp of the basic philosophy and functionality. Besides this channel there would be a place for other platforms such as booklet, poster, flyer, presentation, start-up.

**Customer Segments:** our target would be Campus Køge -> its students taking a full time education, its leadership, staff and teachers; as future plan

Cost structures

*Revenue stream:* from a traditional point of view revenue stream would apply for the income the business generates and also a new, potentially lucrative and innovative means of exploiting potential. Services offered by the blockchain systems being already implemented in a school environment do not aim for the general purpose of income generating.

### **1.0.2 Design thinking - Research: Mate**



**Excel link:** [Blockchain Research](#)

**Video link:** [Don Tapscott: Four Principles for the open world](#)

You can check out an excel document which is contain a lots of information and research since 2008. If you examine deeply you will see how is big and will be bigger this technology. Those sources are the proof of work. There are several fields and lines which are following the blockchain different parts, where it is usable. So, take a look for the database.

### **Terminology and concepts**

The blockchain economy is triggering the invention of many new ideas and the reappropriation of existing concepts and terminology in innovative ways. It prompts investigating the definition of terms that have been taken for granted and passed unquestioned for years, such as money, currency, property, government, sovereignty, and intellectual property. The questioning of underlying definitions and the reappropriation of terms position these concepts more openly and accessibly for application to current situations.

Blockchain-related concepts are more actively in people's minds and ready to apply at the generalized level. For example, consider a library. At the more generalized conceptual level, a library is a system of value exchange; there are product and service offerings, like books and research, being taken up by those with whom the value proposition resonates. New

models like blockchain technology force us to consider reality at the more generalized level of the concepts behind a specific instantiation.

This leads us to imagine other specific situations that could be realized with those concepts. For example, a blockchain is a technology for decentralization. Bitcoin is the instantiation of decentralization as a digital currency, but decentralization could be instantiated in many ways, such as smart property, delegate democracy governance services, and community-based credit bureaus. In short, we start to see the world of possibility, or the world as possibility, as French philosopher Deleuze would say. Further, we need to have tools for realizing this possibility; in the generalized conceptualization process, blockchain-related concepts become ready at hand or available to us, as Heidegger would say.

In this formative environment, we can more easily create new concepts such as GoTo-Lunch-coin or Whatever-coin, applying a fuller conceptualization of coin in the cryptocurrency sense to a new situation. A coin or aptoken becomes a signifier that facilitates some application. I as a community member have earned some coin or token by performing some service like mining (transaction ledger administration) or via crowdfunding that I can burn, spend, or use in the network to acquire or consume something of value.

In this sense, Go-To-Lunch-coin is earned free time from work completed in the morning that can now be spent in refreshing and reenergizing. The economic principle of a cycle of resources expended and replenished is invoked. In this more elemental mode of concept generation, we can more immediately and intuitively understand the innovations of other ideas as we hear them. For example, if we heard of President Coin in the legal setting, it would be easy to quickly intuit that it would likely be the aptoken or remunerative coin for performing the function of establishing precedents, and that there is probably some sort of new decentralized peer-based method for doing so.

### **Executive summary**

Blockchain technology provides an electronic public transaction record of integrity without central authority. The transaction record is a ledger of all transactions that have taken place within a set protocol, recorded in a sophisticated, distributed data structure. The data structure is decentralised and shared by all nodes, i.e. computers, within the participating system or network.

Cryptographic and problem-solving block validation prevents duplicate transactions, double-spending, and ensures ledger integrity. The blockchain does not require a central authority or trusted third party to coordinate interactions, validate transactions, or oversee behaviour. The blockchain can contain sets of documents and record assets. In short, a blockchain is a secure peer-to-peer ledger with storage, analogous to peer-to-peer music sharing systems such as Napster.

In January 2009 blockchain technology was first used publicly to help create Bitcoin, a cryptocurrency-based protocol. While Bitcoin is problematic both socially and economically, and there have been technical glitches with Bitcoin wallets, the blockchain technology has proven robust. In fact, as a demonstration of blockchain technologies robustness, Bitcoin



has been superb, showing the technology to be proof against a wide range of attacks, from criminals to national security agencies.

Blockchain technology has wider applications than just Bitcoin or the other hundreds of cryptocurrencies using it. Blockchain technology can be applied in financial areas where a central, trusted third party has traditionally been used, trade reporting, depository receipts, escrow, trade finance, etc. Since 2009, blockchain applications that extend beyond currencies, such as smart contracts and decentralised autonomous organisations, have been developed and tested.

People use trusted third parties in many roles in finance, as custodians, as payment providers, as poolers of risk, i.e. insurers. Trusted third parties in finance provide four functions:

- Validating the existence of something to be traded;
- Preventing duplicate transactions, i.e. someone selling the same thing twice or 'double-spending';
- Recording transactions in the event of dispute;
- Acting as agents on behalf of associates or members.

If faith in the technology's integrity continues to grow, then blockchain technology might largely displace two roles of a trusted third party, i.e. preventing duplicate transactions and providing a verifiable public record of all transactions. Emerging applications, such as smart contracts and decentralised autonomous organisations, might in future also permit blockchains to act as automated agents.

## **Background**

Blockchain technology was first introduced in 2009 with Bitcoin, a cryptocurrency-based distributed payment protocol. Bitcoin and other cryptocurrencies (also called AltCoins) gained significant momentum in 2013 with Bitcoin's sharp price rise, the historic high being US\$1124.76 on 29 November 2013. High prices and high volatility attracted speculation, as well as proliferation of competitive and complementary cryptocurrencies. Arguably, there are over 500 AltCoins based on blockchain technology as of November 2014.

Technologists have drawn attention to the technology underpinning cryptocurrencies, known as blockchain. Blockchain's main innovation is a public transaction record of integrity without central authority. Blockchains are decentralised by nature that is shared by all nodes connected to a set network. Blockchain technology offers everyone the opportunity to participate in secure contracts over time, with a secure record of what was agreed at that time.

Z/Yen and the Long Finance community's interest in cryptocurrencies and blockchain technology began with a thought experiment on a hypothetical electronic currency, 'Pecunium', in 2005. In 2008, Long Finance established the Eternal Coin programme, exploring concepts of value and money (Cooper, 2010).

A 2011 research project on emerging architectures for money and commerce noted the potential of cryptocurrencies to transform transactions across time and space (Z/Yen Group,

2011). Since 2011 cryptocurrencies and blockchain technology have become an area of research interest for Long Finance with a series of events and discussions exploring how blockchain technology could be applied in conventional financial services, including insurance.

### **Approach & methodology**

Following desk research, Z/Yen organised a workshop on 11 September in London “People, Risk and Uncertainty over Time: How Might Blockchain Technology Transform Personal Insurance” ([more information](#)). This workshop invited insurance and financial services professionals, as well as cryptographic technology experts, to discuss blockchain technology and the implications of applying it to personal insurance. Interestingly, half the audience (about 30 people) claimed to have used Bitcoins.

Between August and November, the Z/Yen team interviewed a cross-section of 30 blockchain technology experts, system developers, insurance industry professionals, regulators, consumer bodies, trade bodies, and research institutes in Europe, North America, Australia and Asia. These semi-structured interviews covered blockchains and related applications, their possible relevance to insurance, and risks, benefits, and obstacles to applying blockchain technology in personal insurance.

In order to encourage international participation and present preliminary findings, a webinar was held on 1 October, “How Might Blockchain Technology Transform Personal Insurance”.

Further, Z/Yen led five presentations and discussions on blockchains at larger events with groups ranging from 30 to 200 people, between September and November, as follows:

- financial services providers, Europe;
- financial service providers, Asia;
- financial service providers, USA;
- central bankers, UK;
- regulators and compliance officers, Europe.

These events were invaluable in assessing current knowledge and thinking.

### **What impact could the technology behind bitcoin have (?)**

*(Video above, click on it and you will understand this part too)*

According to Tapscott Group CEO [Don Tapscott](#), blockchains, the technology underpinning the cryptocurrency, could revolutionize the world economy. In this interview with McKinsey’s Rik Kirkland, Tapscott explains how blockchains—an open-source distributed database using state-of-the-art cryptography—may facilitate collaboration and tracking of all kinds of transactions and interactions. Tapscott, coauthor of the new book *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World*, also believes the technology could offer genuine privacy protection and “a platform for truth and trust.” An edited and extended transcript of Tapscott’s comments follows.

### **How the blockchain works**

The blockchain is basically a distributed database. Think of a giant, global spreadsheet that runs on millions and millions of computers. It's distributed. It's open source, so anyone can change the underlying code, and they can see what's going on. It's truly peer to peer; it doesn't require powerful intermediaries to authenticate or to settle transactions.

It uses state-of-the-art cryptography, so if we have a global, distributed database that can record the fact that we've done this transaction, what else could it record? Well, it could record any structured information, not just who paid whom but also who married whom or who owns what land or what light bought power from what power source. In the case of the Internet of Things, we're going to need a blockchain-settlement system underneath. Banks won't be able to settle trillions of real-time transactions between things.

So this is an extraordinary thing. An immutable, unhackable distributed database of digital assets. This is a platform for truth and it's a platform for trust. The implications are staggering, not just for the financial-services industry but also right across virtually every aspect of society.

Most blockchains—and Bitcoin is the biggest—are what you call permission-less systems. We can do transactions and satisfy each other's economic needs without knowing who the other party is and independent from central authorities. These blockchains all have a digital currency of some kind associated with them, which is why everybody talks about Bitcoin in the same breath as the blockchain, because the Bitcoin blockchain is the biggest.

But to me, the blockchain, the underlying technology, is the biggest innovation in computer science—the idea of a distributed database where trust is established through mass collaboration and clever code rather than through a powerful institution that does the authentication and the settlement.

### **How disruption can occur**

The financial-services industry is up for serious disruption—or transformation, depending on how it approaches this issue. For the research for Blockchain Revolution, we went through and identified eight different things that the industry does: it moves money, it stores money, it lends money, it trades money, it attests to money, it accounts for money, and so on.

### **What could go wrong?**

We identified showstoppers and we went through them in detail in our research and in the book. There are showstoppers such as the energy that's consumed to do this, which is massive. Another showstopper is that this technology is going to be the platform for a lot of smart agents that are going to displace a lot of humans from jobs. Maybe this whole new platform is the ultimate job-killer.

The biggest problems, though, have to do with governance. Any controversy that you read about today is going to revolve around these governance issues. This new community is in its infancy. Unlike the Internet, which has a sophisticated governance ecosystem, the whole world of blockchain and digital currencies is the Wild West.

It's a place of recklessness and chaos and calamity. This could kill it if we don't find the leadership to come together and to create the equivalent organizations that we have for governance of the Internet. We have the Internet Engineering Task Force, which creates standards for the Net. We have Internet Governance Forum, which creates policies for governments. We have the W3C Consortium, which creates standards for the Web.

There's the Internet Society; that's an advocacy group. There's the Internet Corporation for Assigned Names and Numbers (ICANN), an operational network that just delivers the domain names. There's a structure and a process to figure out things. Right now, there's a big debate that continues about the block size. We need a bigger block size to be able to handle all of the transactions that will be arising. There are big differences. There are legitimate points of view, but the problem is, there's no process to be able to come up with an optimal solution.

### **1.0.3 Design thinking - Analysis: Mate and Hunor**



**Image link:** [Blockchain\\_Usecases](#)

### **Distributed censorship-resistant organizational models**

The primary argument for Blockchain 1.0 and 2.0 transactions is the economic efficiency and cost savings afforded by trustless interaction in decentralized network models, but freedom and empowerment are also important dimensions of the blockchain.

Decentralized models can be especially effective at promoting freedom and economic transfer in countries with restrictive political regimes and capital controls. Freedom is available in the sense of pseudonymous transactions outside of the visibility, tracking, and regulatory purview of local governments.

This can be a significant issue for citizens in emerging markets where local capital controls, government regulations, and overly restrictive economic environments make it much harder to engage in a variety of standard activities, including starting new businesses. State economic controls, together with a lack of trust in fiat currency, have been driving a lot of interest in cryptocurrencies.

The freedom attribute associated with blockchain technologies becomes more pronounced in Blockchain 3.0, the next category of application beyond currency and market transactions. Through its global decentralized nature, blockchain technology has the potential ability to circumvent the current limitations of geographic jurisdictions.

There is an argument that blockchain technology can more equitably address issues related to freedom, jurisdiction, censorship, and regulation, perhaps in ways that nation-state models and international diplomacy efforts regarding human rights cannot. Irrespective of supporting the legitimacy of nation-states, there is a scale and jurisdiction acknowledgment and argument that certain operations are transnational and are more effectively administered, coordinated, monitored, and reviewed at a higher organizational level such as that of a World Trade Organization.

The idea is to uplift transnational organizations from the limitations of geography based, nation-state jurisdiction to a truly global cloud. The first point is that transnational organizations need transnational governance structures. The reach, accessibility, and transparency of blockchain technology could be an effective transnational governance structure.

Blockchain governance is more congruent with the character and needs of transnational organizations than nation-state governance. The second point is that not only is the transnational governance provided by the blockchain more effective, it is fairer. There is potentially more equality, justice, and freedom available to organizations and their participants in a decentralized, cloud-based model.

This is provided by the blockchain's immutable public record, transparency, access, and reach. Anyone worldwide could look up and confirm the activities of transnational organizations on the blockchain. Thus, the blockchain is a global system of checks and balances that creates trust among all parties. This is precisely the sort of core infrastructural element that could allow humanity to scale to orders-of-magnitude larger progress with truly global organizations and coordination mechanisms.

One activity for which this could make sense is the administration of the Internet. Internet administration organizations have a transnational purview but are based in nation-state localities. An example is ICANN, the Internet Corporation for Assigned Names and Numbers. ICANN manages Internet protocol numbers and namespaces, coordinating the translation of `www.example.com` to the numeric IP address `93.184.216.119` for connection across the Internet.

***“Blockchain technology simultaneously highlights the issue of the appropriate administration of transnational public goods and presents a solution.”***

Wikipedia is a similar transnational public good that is currently subject to a local jurisdiction that could impose on the organization an artificial or biased agenda. It is possible that blockchain mechanisms might be the most efficient and equitable models for administering all transnational public goods, particularly due to their participative, democratic, and distributed nature.

A notable case in which jurisdictional nation-state entities were able to effect centralized and biased control is WikiLeaks. In the Edward Snowden whistle-blowing case in 2010, individuals were trying to make financial contributions in support of the WikiLeaks organization but, strongarmed by centralized government agendas, credit card payment networks and PayPal, refused to accept such contributions, and Wiki-Leaks was effectively embargoed.<sup>75</sup> Bitcoin contributions, had they been possible at the time, would have been direct, and possibly produced a different outcome.

The Electronic Freedom Foundation (EFF), a nonprofit organization that supports personal freedoms, and other related organizations are similarly located in jurisdictional locations at present, which could always mean the operation of curtailed agendas if authorities were to exercise influence over the organization and individuals involved.

### **Namecoin: Decentralized Domain Name System**

One of the first non currency uses of blockchain technology was to prevent Internet censorship with Namecoin, an altcoin that can be used to verify Domain Name System (DNS) registrations. Namecoin is an alternative DNS that is transnational and cannot be controlled by any government or corporation. The benefit of a decentralized DNS is that it makes it possible for anyone worldwide who might be otherwise suppressed or censored to publish information freely in the Internet.

Just as Bitcoin is a decentralized currency that cannot be shut down, Namecoin is the basis for a decentralized DNS (i.e., web URLs).<sup>76</sup> The idea is that URLs permanently embedded in the blockchain would be resistant to the government seizing of domains. The censorship issue is that in a URL such as google.com, centralized authorities control the top-level domain, the .com portion (the United States controls .com URLs), and therefore can potentially seize and redirect the URL. Centralized authorities control all top-level domains; for example, China controls all .cn domains.

Therefore, a decentralized DNS means that top-level domains can exist that are not controlled by anyone, and they have DNS lookup tables shared on a peer-to-peer network. As long as there are volunteers running the decentralized DNS server software, alternative domains registered in this system can be accessed. Authorities cannot impose rules to affect the operation of a well-designed and executed global peer-to-peer top-level domain. The same Bitcoin structure is used in the implementation of a separate blockchain and coin, Namecoin, for decentralized DNS.

Namecoin is not at present intended for the registration of all domains, but as a free speech mechanism for domains that might be sensitive to censorship (for example, in countries with limited political freedom). The top-level domain for Namecoin is .bit. Interested parties register .bit domains with Namecoin. The actions necessary to register a new domain or to

update an existing one are built in to the Namecoin protocol, based on transaction type—for example, the “name\_new” transaction at a cost of 0.01 NMC (Namecoin is convertible in/out of Bitcoin).

*(Domains can be registered directly with the Namecoin system or via a registration service like <https://dotbit.me/>.)*

Because the top-level domain .bit is outside the traditional operation of the Internet, to facilitate viewing .bit websites, there are .bit proxy servers to handle DNS requests in a browser, as well as Firefox and Chrome extensions. According to the Bitcoin Contact website as of October 2014, there are 178,397 .bit domains registered, including, for example, wikileaks.bit.

The key point is that .bit domains are a free-speech mechanism, because now having the ability to view .bit websites means attempts to silence those with a legitimate message will have less of a chance of succeeding. Just as there are benefits to having decentralized currency transactions, there are benefits to having many other kinds of decentralized transactions.

### **Challenges and other decentralized DNS services**

Technical issues were found with the Namecoin implementation that left .bit domains vulnerable to takeover (a bug that made it possible to update values if the transaction input name matched the transaction output name, as well as new registrations to be overridden).

Developers have been remedying these issues. Other critics (as with Bitcoin in general) point out how the key features of decentralized DNS services (cheap and anonymous domain name creation, and a system that places domain names out of the reach of central authorities) enable bad players and illegality. However, an industry white paper counters these claims with examples of using the public traceability feature of the blockchain ledger to apprehend criminals, and points out that there are many legitimate uses of this technology.

Meanwhile, other decentralized name services are in development, such as a similar [.P2P decentralized top-level domain from BitShares](#). The project points out how the decentralized DNS model eliminates the certificate authority as the third-party intermediary (which can leave URLs vulnerable to attack), and that a blockchain model can also be more secure because you lose control of your domain only if you share the private key. Dot-P2P has other features to improve DNS registry, such as auction-like price discovery to counter domain-name squatting. Related to decentralized DNS services is digital identity confirmation services; in October 2014, BitShares launched the KeyID service toward this end. KeyID, rebranded from Keyhotee, provides an identification and email system on a decentralized blockchain for secure messaging and for secure authentication.

### **Digital identity verification**

[OneName](#) and [BitID](#) are examples of blockchain-based digital identity services. They confirm an individual’s identity to a website. Decentralized digital verification services take advantage of the fact that all Bitcoin users have a personal wallet, and therefore a wallet address. This could speed access to all aspects of websites, simultaneously improving user experience,

anonymity, and security. It can also facilitate e-commerce because customers using Bitcoin-address login are already enabled for purchase.

On the surface, OneName is an elegant Bitcoin-facilitating utility, but in the background, it is a more sophisticated decentralized digital identity verification system that could be extensible beyond its initial use case. OneName helps solve the problem that 27- through 34-character Bitcoin addresses are (at the expense of being cryptographically sound) cumbersome for human users.

Some other Bitcoin wallet services and exchanges, like Coinbase, have allowed Bitcoin to be sent to email addresses for some time. The OneName service is a more secure solution. With OneName, users can set up a more practical name (like a social media handle) to use for Bitcoin transactions.

After a user is registered with OneName, asking for payment is as easy as adding a plus sign to your username (for example, +DeMirag 99). OneName is an open source protocol built on the Namecoin protocol that puts users in charge of their digital identity verification, rather than allowing centralized social media sites like Facebook, LinkedIn, and Twitter to be the de facto identity verification platform, given that many websites have opted to authenticate users with social media APIs.

A similar project is BitID, which allows users to log in to websites with their Bitcoin address. Instead of “Login with Facebook,” you can “Connect with Bitcoin” (your Bitcoin address). BitID is a decentralized authentication protocol that takes advantage of Bitcoin wallets as a form of identification and QR codes for service or platform access points. It enables users to access an online account by verifying themselves with their wallet address and uses a mobile device as the private-key authenticator.

Another proposed digital identity verification business is Bithandle, which was developed as a hackathon project. Bithandle offers short-handle registration, verification, and e-commerce service. As with Onename and BitID, users can register an easy-to-use handle—for instance, “Coinmaster”—that is linked to a wallet address via a public or private real-life identity check and a Bitcoin blockchain transaction. The service offers ongoing real-time digital identity verification and one-click auto-enabled ecommerce per “Login with Bitcoin” website access.

An obvious problem with the mainstream adoption of Bitcoin is the unwieldy 32-character Bitcoin address, or QR code, needed to send and receive funds. Instead, Bithandle gives users the ability to link a short handle to a Bitcoin address, which is confirmed initially with real-life identity and looked up in the blockchain on demand at any future moment. Real-time digital identity verification services could be quite crucial; already the worldwide market size for identity authentication and verification is \$11 billion annually.

Specifically, how Bithandle works is that in the digital identity registration process, participants register a Bitcoin username, an easy-to-use handle that can then be used to “Login with Bitcoin” to websites. As mentioned, this is similar to the ability to access websites by “Login with Facebook” or “Login with Twitter” but automatically connects to a user’s Bitcoin address for proof of identity. When a user sets up a Bit-handle, his real-life identity is



confirmed with Facebook, Twitter, LinkedIn, or other services, and this can be posted publically (like OneName) or not (as OneName does not allow), with the user's Bithandle.

Later, for real-time digital identity verification, "Logging in with Bitcoin" means that a Bit-handle is already connected to a Bitcoin address, which securely facilitates ecommerce without the user having to register an account and provide personal identity and financial details. Bithandle thus helps streamline user interactions with websites in several ways. First, websites do not have to maintain user account registries ("honeypot" risks for hacking). Second, every user "Logging in with Bitcoin" is automatically enabled for one-click e-commerce purchases. Third, the Bithandle service can provide real-time blockchain lookups to confirm user digital identity at any future time on demand—for example, to re-authorize a user for subsequent purchases.

### **Blockchain neutrality**

Cryptography experts and blockchain developers and architects point out the importance of designing the blockchain industry with some of the same principles that have become baked into the Internet structure over time, like neutrality.

In the case of the Internet, net neutrality is the principle that Internet service providers should enable access to all content and applications regardless of the source and without favoring or blocking particular products or websites. The concept is similar for cryptocurrencies: Bitcoin neutrality means the ability for all persons everywhere to be able to easily adopt Bitcoin. This means that anyone can start using Bitcoin, in any and every culture, language, religion, and geography, political system, and economic regime. Bitcoin is just a currency; it can be used within any kind of existing political, economic, or religious system.

For example, the Islamic Bank of Bitcoin is investigating ways to conduct Sharia-compliant banking with Bitcoin. A key point of Bitcoin neutrality is that the real target market for whom Bitcoin could be most useful is the "unbanked," individuals who do not have access to traditional banking services for any number of reasons, estimated at 53 percent of the worldwide population. Even in the United States, 7.7 percent of households are forecast to be unbanked or underbanked.

Bitcoin neutrality means access for the unbanked and underbanked, which requires Bitcoin solutions that apply in all low-tech environments, with features like SMS payment, paper wallets, and batched blockchain transactions. Having neutrality-oriented, easy-to-use solutions (the "Twitter of emerging market Bitcoin") for Bitcoin could trigger extremely fast uptake in underbanked markets, continuing the trend of 31 percent of Kenya's GDP being spent through mobile phones.

There are different SMS Bitcoin wallets and delivery mechanisms (like [37Coins96](#) and [Coinapult](#), and projects like [Kipochi97](#) that are integrated with commonly used emerging-markets mobile finance platforms like M-Pesa. A similar project is a mobile cryptowallet app, [Saldo.mx](#), which uses the Ripple open source protocol for clearing, and links people living in the United States and Latin America for the remote payment of bills, insurance, airtime, credit, and products.

## Digital divide of Bitcoin

The term “*digital divide*” has typically referred to the gap between those who have access to certain technologies and those who do not. In the case of cryptocurrencies, if they are applied with the principles of neutrality, everyone worldwide might start to have access. Thus, alternative currencies could be a helpful tool for bridging the digital divide. However, there is another tier of digital divide beyond access: know-how.

A new digital divide could arise (and arguably already has in some sense) between those who know how to operate securely on the Internet and those who do not. The principles of neutrality should be extended such that appropriate mainstream tools make it possible for anyone to operate anonymously (or rather pseudonymously), privately, and securely in all of their web-based interactions and transactions.

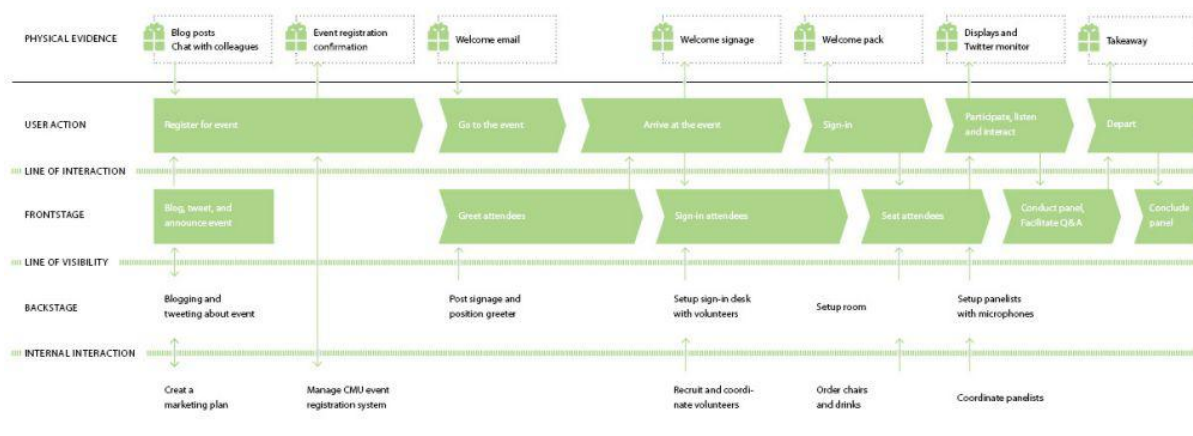
## Service Blueprint<sup>15</sup>

What is it?

Service blueprints are a way to specify and detail each individual aspect of a service. This usually involves creating a visual schematic incorporating the perspectives of both the user, the service provider and other relevant parties that may be involved, detailing everything from the points of customer contact to behind-the-scenes processes.

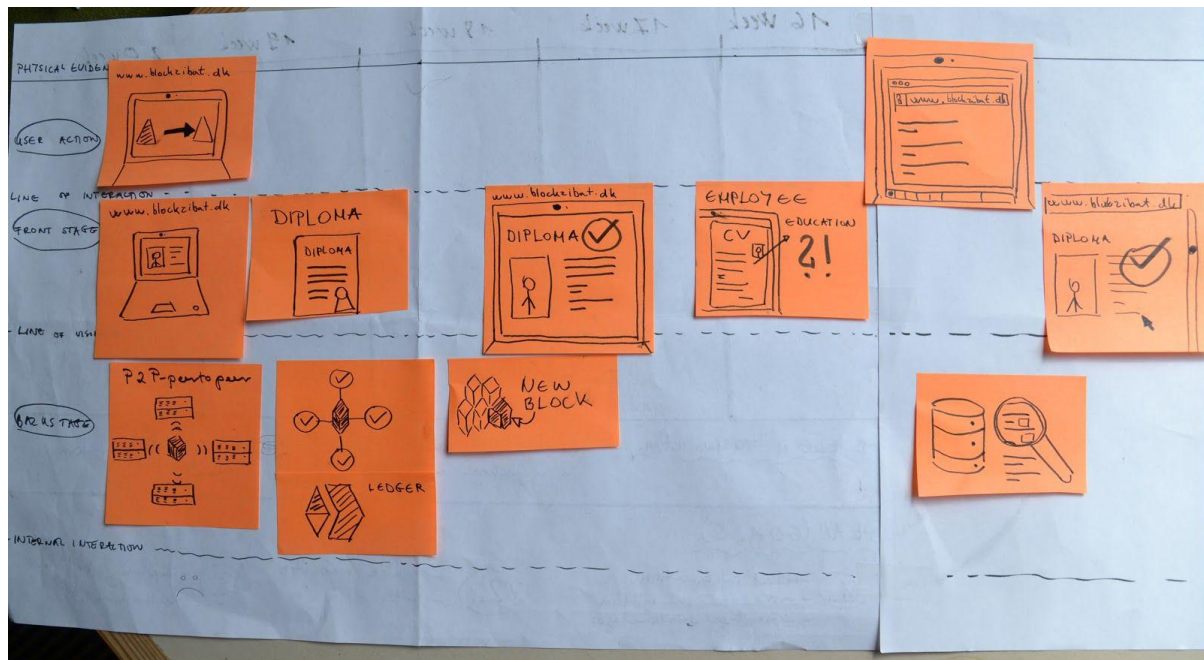
Why is it used?

By describing and outlining all of the elements contained within a service, the blueprint allows the most crucial areas to be identified. Service blueprints are able to show the processes that lie behind the critical service elements around which user experience is defined.



The “line of interaction” represents the touch points between the user and the service provider. The “line of visibility” represents the distinction between visible front-office staff and the back-office workers and processes that are invisible to the user.

<sup>15</sup> This is service design thinking - Marc Stickdom - Wiley; 1 edition (January 11, 2012)



Service blueprint (see [appendix](#))



A north american school started using blockchain to authenticate certificates. "Lying about education credentials is a common problem, and today it is very easy to counterfeit academic diplomas and certificates. In addition, the process to check someone's degree is quite laborious, as you need to get the school's contact information, reach the right person and do it again for every candidate. Medium and big companies often delegate this task to third parties as it's very time and money consuming."<sup>16</sup> explains Blake Haggerty, a recruiter at CoreOS.

The example of the Holberton School is one of the good ways to illustrate the possible use and implementation of blockchain in a school environment.

Looking at the Service Blueprint:

- When a given student finishes his studies at a particular educational program a staff in the office put his certificate on the blockchain
- In the background the certificate will form another block that will be connected to the already existing blocks
- The process is going to be verified by a consensus by the other members on the system
- After verification the new block (the certificate) will be on the public ledger - in other words publically available

<sup>16</sup> <http://thenewstack.io/one-school-using-bitcoin-blockchain-authenticate-degrees/>

- Even though the certificate is public it cannot be deleted or edited
- So when it is time to look for an internship or for employment the employee can easily check the certificate online

### 3. 1.1 Design

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> **AI-Structure-&-Navigation** > **Visual-Communication** > **DT- Sketches**

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#### 1.1.1 Design Description:



We did some research about the design how it should look (?) and what is the trendy nowadays (?). We kept in mind these topics around decentralized and distributed systems are very special and the design should be the same. Well, most of sites are using a proportionally new design called 'Flat Design'. Flat design is a minimalist UI design genre, or design language, commonly used in graphical user interfaces (such as web applications and mobile apps), especially in graphical materials as posters, arts, guide documents, publishing products. These (most popular and famous) sites are also using one of this design type.

Flat design is a style of interface design emphasizing minimum use of stylistic elements that give the illusion of three dimensions (such as excessive use of drop shadows, gradients or textures) and is focused on a minimalist use of simple elements, typography and flat colors.

Designers may prefer flat design because it allows interface designs to be more streamlined and efficient. It is easier to quickly convey information while still looking visually appealing and approachable. Additionally, it makes it easier to design an interface that is responsive to

changes in browser size across different devices. With minimal design elements, websites are able to load faster and resize easily, and still look sharp on high-definition screens.

We also went deeper and we examined those sites source code. Behind the scenes we found a framework which called 'Bootstrap'. Actually it is not a surprise, because if you mix this framework with the flat design you will get a pretty good and fast website at the same time. A perfect combination of the visual idea & smart coding. After that we decided to make our flat design style, which is based on the bootstrap framework to get a fast and good looking responsive website.

Examples for the Bootstrap framework:

- > <http://blockstrap.com/>
- > <https://blockchain.info/wallet>
- > <http://www.multichain.com/>

Some examples for the Flat Design (in general), how wide it is could be:

- > <http://anticosetificiofiorentino.com/> ( - one paged website)
- > <http://www.protest.eu/en/> ( - jquery based website)
- > <http://cfye.com/> ( - two sided website)

### **1.1.2 AI Structure & Navigation: Mate - Promo oldal leírása részleteiben**



**Website link:** [Flat\\_Design\\_Guide](#)

**Video link:** [What\\_Is\\_Flat\\_Design](#)

**Video link:** [Flat Design vs Realism CASE STUDY](#)

**Video link:** [Flat Design Animation](#)

*Flat Design or Flat UI* has been one of the most talked about trends in web and user interface design this year. It has frequently been compared with skeuomorphic design, because of its completely opposite principles and [style](#).

Designers have voiced questions over whether this is a lasting trend or just another passing fad. Regardless of the future and the voices against flat, most designers have been tempted to try implementing this trend in some of their work. Here we'll delve a little deeper into the style, its historical roots and how to start designing in the flat style right away.

A warning before we begin: *flat design can be used to create really beautiful, simple interfaces, but it's not necessarily appropriate for every project*. Be mindful of what you're trying to achieve visually and what you want to communicate.

### **So, what is Flat Design (?)**

As the name indicates, flat design is defined by flatness of style: simplifying an interface by removing extra elements such as shadows, bevels, textures and gradients that create a 3D look.

The idea is to create a finished design that lives in only two dimensions, without losing any of the functionality that a "regular" interface provides. This creates a new challenge for the designer, because by stripping an interface of its decorations and effects, it becomes harder to define the main actions and elements in a design.

Flat design comes from the wish to create more digital interfaces, and an open canvas for interface innovation in digital devices. A good example of flat design is this [icon design collection for Mac OSX](#), where some of the most famous Mac icons are re-imagined as flat versions of themselves. You can easily see how the icons maintain their style and form even though they're stripped of details, shadows and textures.



### **How to create a flat design (?)**

## Buttons

When creating a button, using a border, gradient and drop-shadow will make the element stand out against the background and content. This makes it easily identifiable as a clickable element.

When creating a flat button, you can't use these details, so the focus should be put on grid organization and color contrast. You can use bevel and shadow as long as you keep the flat look of the button, but you'll want to make these controls as simple as possible.



## Forms

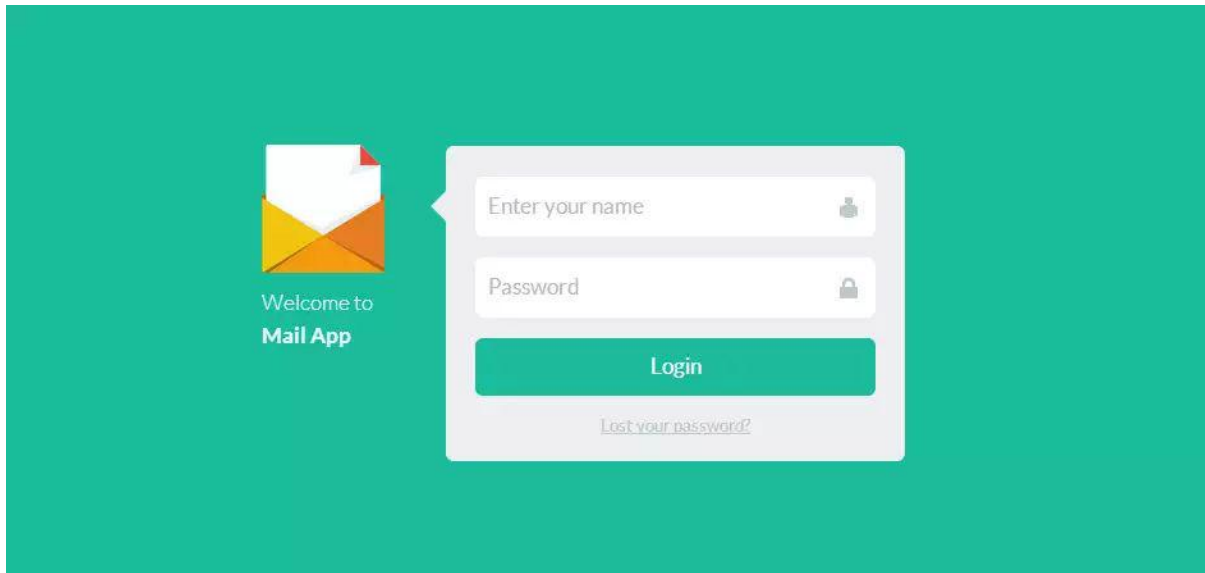
Forms are a crucial element to get right in a flat design. Text areas, inputs and dropdowns shouldn't use inset shadows as they usually do by default. You can change this by styling the form elements with CSS yourself: see this post on how to [create a simple login form and style](#). Or, if you want to have full control over your elements, try using a plugin that supports themes such as [uniformjs](#) and style these themes the way you want, or even create new ones.

## Typography

Typography is a very important element in flat design. Since the interface is more minimalistic, you can use typography to help you create the style and mood you're looking for. You can set a mood just by using a custom and specific font with a flat design outline. Since the background is simple, the font will pop out and set the style for itself. See these uses of [typography in flat design](#) to inspire you and learn how others are using it to achieve a particular look.

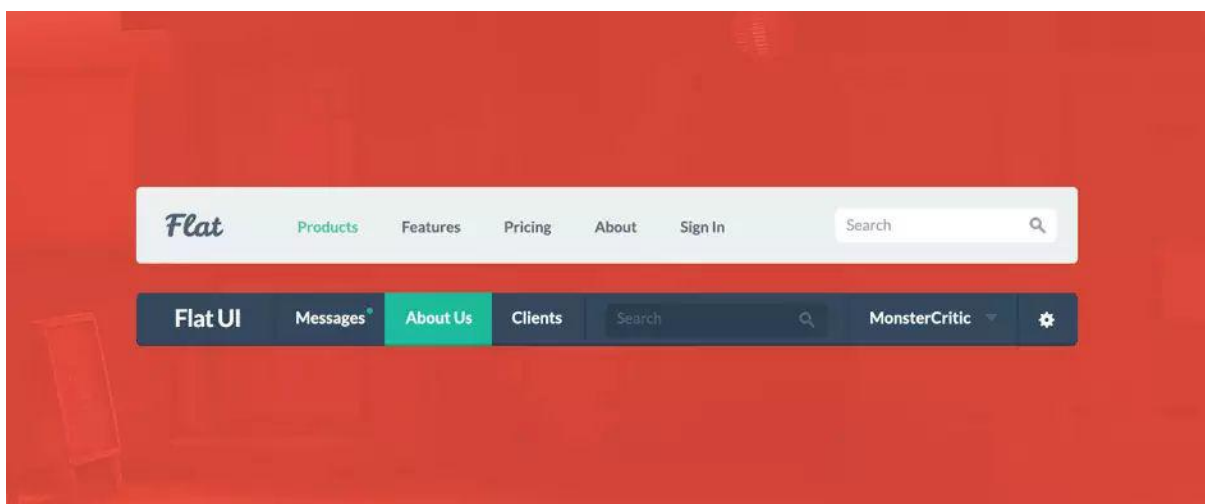
## Colors

A fundamental part of designing an interface is defining a color palette. The color schemes used in flat design interfaces tend to be bolder and brighter than some other color palettes. [Flat UI Colors](#) was developed with this in mind and is a great place to check out some of the best (and most popular) colors being used in flat design today.



When picking a color palette, remember to think about how colors will help users navigate a site. Be sure to specify a color for the main actions on your website: buttons such as “Submit,” “Send,” “See More,” etc. should all be the same color, ideally a vivid one which will provide a strong contrast with the background. If your logo or brand has a main color, that should be the one used for the main controls. Don’t overuse it though, or you risk make it less important in the user’s eyes.

You should also choose a secondary button color, usually a light gray. That way you can line up two buttons, for example “Submit” and “Cancel”, with “Submit” as the main action and “Cancel” a secondary one. Color choice is especially important in flat design, because when you’re using flat buttons, these colors will be one of the main identifiers that help the user recognize them.



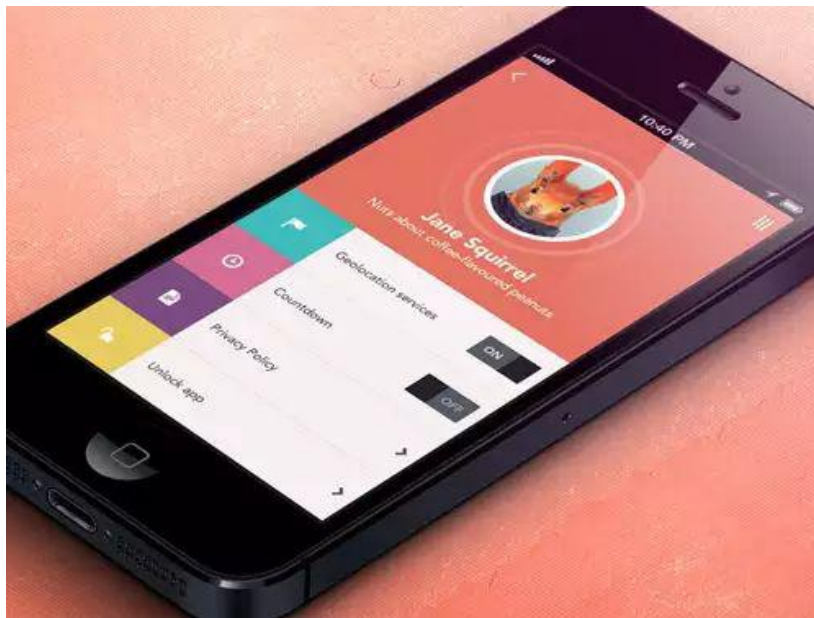
## Shapes

Usually, you’ll want to make buttons square or square with rounded corners, depending on the style of the site. You can be more creative and use other shapes such as circles, triangles or even custom shapes, but keep in mind the latter might be a bit more risky. Be



sure to maintain consistency throughout your interface controls, and to organize content in such a way that the user will be able to identify and recognize your titles, content and controls.

Below you can see the difference between a regular [Twitter Bootstrap](#) button and the same button in a flat style on Flatstrap, a flat version of Twitter Bootstrap. The regular button has rounded corners and a really subtle gradient and drop-shadow, while the flat version is completely stripped of these effects, merely changing to a darker shade on mouse-over.



### **Where should flat design be used (?)**

Flat design should be used moderately. Even though it's a simple way to create a light and minimalistic interface, it isn't right for every website. For example, flat can be great if you're designing a portfolio, or web tech startup site, but it can be a limitation if you're trying to create something more complex.

If you're designing a website for children, you'll probably want to make it flashy and colorful, full of fun elements and animated characters. In the same way, if you're creating a gaming website it should be all about graphics and effects, and the design should be connected to the game.

These types of website can be done in flat, but the flat style may end up harming your website. Always keep in mind your target audience and the message you're looking to convey. If flat design can be used while keeping your message clear, use it, but don't make a trend or a visual style more important than your website's content.

### **Usability is (always) more important than looks**

If you've made the decision to create a flat design for your website or product, be sure to [test your mockups or prototypes with real people](#) to ensure that your work achieves its objective. You can also try A/B Testing to test two different designs and see which converts more. The main purpose of a web app, mobile app or website should always be to clearly communicate

a message and provide a usable and intuitive interface for the user. It's the designer's job to make sure a certain design aesthetic doesn't hurt usability.

If you create a beautiful design that users can't understand, then you are hurting the product. Trends and styles should always be used in harmony with the objectives of the project. It's easy to lose yourself when creating visual work that's clear in your mind, but at the end of the day, numbers and tests with users are always the best way to know what's really working and what's not. Sometimes a simple change can make a great difference to the user.

### **So, should I use Flat Design (?)**

Always keep in mind that a trend is only a trend. Try to create a great design, but one that is right for your target user. The priority is to create a functional and usable website, not a good-looking and trendy website. As Wells Riley said in his post [Less Aesthetic. More Design](#), "Design is a form of problem solving. Never forget that."



### 1.1.3 Visual Communication: Mate



One of the reasons that this type of design has taken off is that it is ideally suited to mobile devices and apps, any interface that uses it normally being more streamlined and efficient. The latter is important when it comes to mobile devices (bandwidth is always an issue here) and as the growth of mobile usage grows apace, so does the appeal of Flat Design.

Flat design has taken the design world by storm in the few years it's been around, but no design movement ever stays 100% pure to its roots and ideals. That's exactly what's happening with flat design: It's gradually seen subtle-though-meaningful changes to its original iteration.

These changes were enough to make watchers and experts dub the new iteration as Flat Design 2.0. 2.0 is very interesting because it strikes the fine balance between just enough changes to alter the user experience and staying true to its original principles.

The evolution of Flat into 2.0 was inevitable, though: As designers got more comfortable with Flat, they could see that, for all of its popularity, some issues weren't being properly addressed. And now we have 2.0 to address some of these shortcomings.

## Origins of Flat Design

Look at flat design as a sort of rebellion against the then-popular design style of skeuomorphism. It relied on 3D effects to copy the real-life properties of 3D objects as a way to use familiarity to help the user experience. For instance, in initial iterations of Amazon's Kindle Fire, there was a 3D bookshelf in the background to reinforce the purpose of the tablet for reading.



When Apple, a huge proponent of skeuomorphic design, decided, in 2012, to abandon skeuomorphism, that heralded a full swing to flat, which has remained very popular for the last few years. Its emphasis on minimalism has also helped to propel it to its current ubiquity.

### Flat is characterized by its absence of:

- Raised elements that signify to users that they can be clicked;
- hollow or sunken elements that signify to users that they can be filled (think search fields and other input fields).

### Transition to 2.0

In spite of flat's success, some designers started noticing legitimate flaws that weren't being addressed in the design community. While flat gained a lot of steam due to its welcome minimalism, it went a bit too far in the austere direction. The characteristics of some 3D effects turned out to be excessive and adversely impacted the user experience.

Thus, it was inevitable that another change would occur. That's where we are today with the dawn of flat design 2.0.

### Flat Design's usability problems

All of flat's usability problems can be summed up in the following statement: Flat typically trades in a user's needs for hip aesthetics.

In other words, designers designing for an interface to be 'flat' will put a greater emphasis on keeping things minimal, non-3D, and vibrant/bold instead of putting the user experience first. That's usually where all bad things in the design world start, and that's why flat has evolved to 2.0.

### Here are the common usability problems with flat:

- absence of all-important signifiers (gradients, shadows, underlines, etc.);
- absence of familiar patterns (blue, underlined text for links, etc.);
- absence of contextual indications (CTA placement, actionable copy, etc.).

Perhaps the most notorious example in recent memory of all of flat's usability problems was Microsoft's release of Windows 8, with its so-called Metro UI. That design was the epitome of flat because everything was flat to the extreme.



The user experience was so bad because a completely flat design means that users aren't being given the necessary clues to tell them what can be clicked and what can't be on an interface. As a result, users are naturally forced to spend extra time figuring this out by

experimentation or, worse still, perform actions out of error that they didn't want in the first place!

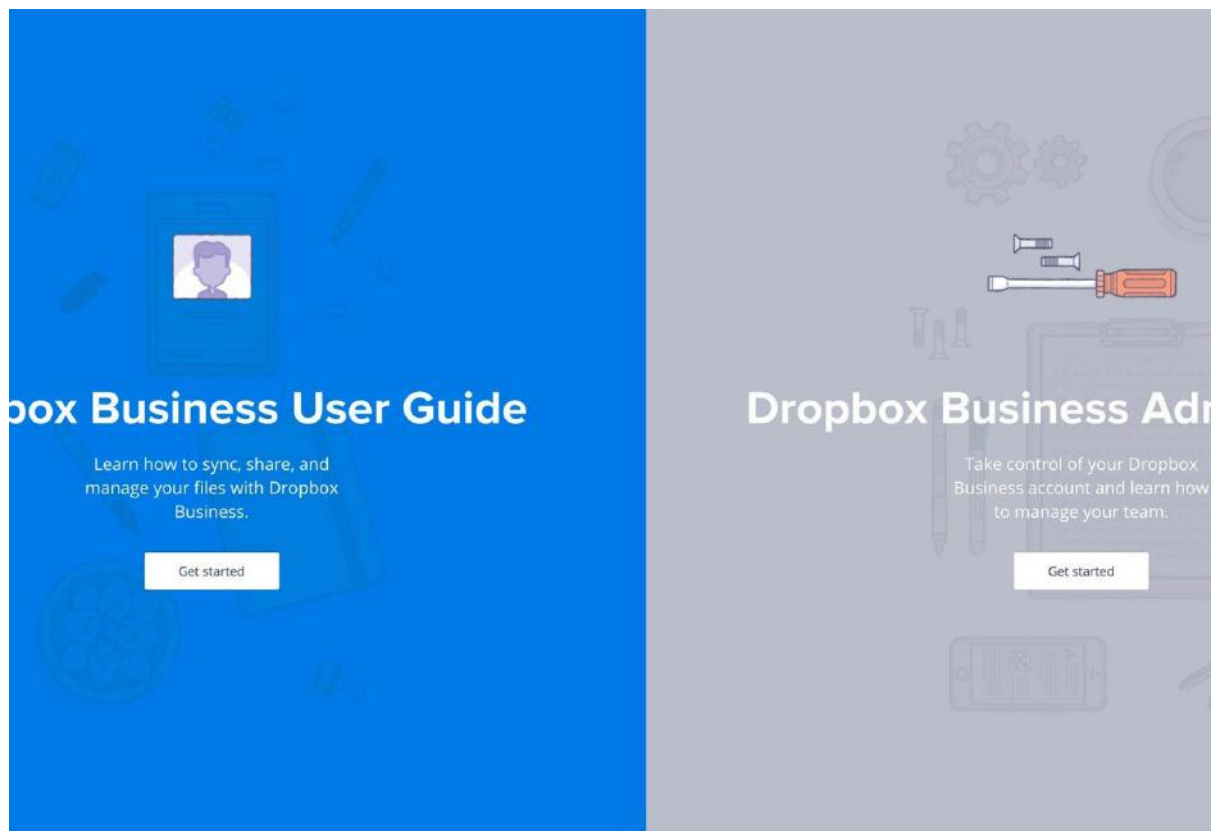
As you can see, the Windows 8 screen is so flat that it's impossible for people to tell what to click and what not to click. Even if users are already familiar with basic site navigation, that doesn't mean that it's a good idea to remove all signifiers (clues that tell users that they can interact with page elements) and hints of affordances (indications of how users can interact with page elements).

### Great examples of Flat Design 2.0

2.0 is a subtle change or improvement over flat, so it may take more concentration to spot true 2.0 in websites and interfaces. That's why we're going to walk you through some current, big examples of 2.0 that are already in full operation.

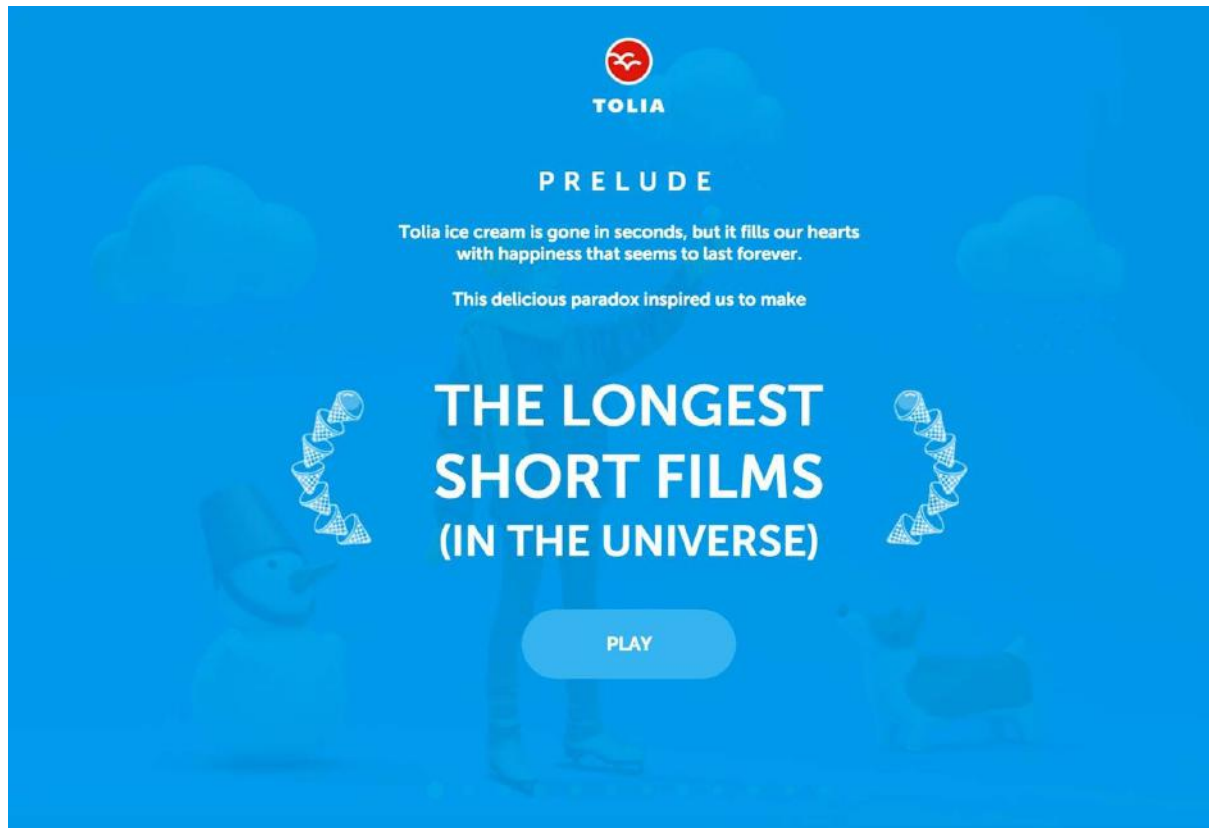
#### The Dropbox Guide:

Dropbox's guide may at first look really flat, but if you look more closely, you'll see 3D suggestions that clearly communicate to users that some elements are raised over others. This is primarily evident in images of the boy's head (on the left side) and the screwdrivers (on the right side). Both images have strong, though subtle, black borders, which communicate depth and the impression that they're sitting on top of the background instead of blending in with it.



**Tolia Ice Cream:**

Tolia's site is full of subtle, raised effects that give the distinct impression of 3D while the overall design is still flat and minimal. The raised impression is present in the headline, the sub-headline and the description (ie., the page copy). It's also present in the call to action button and the CTA copy inside the button. You can thank the subtle use of fine shadows all around the edges of these elements for giving this raised impression.

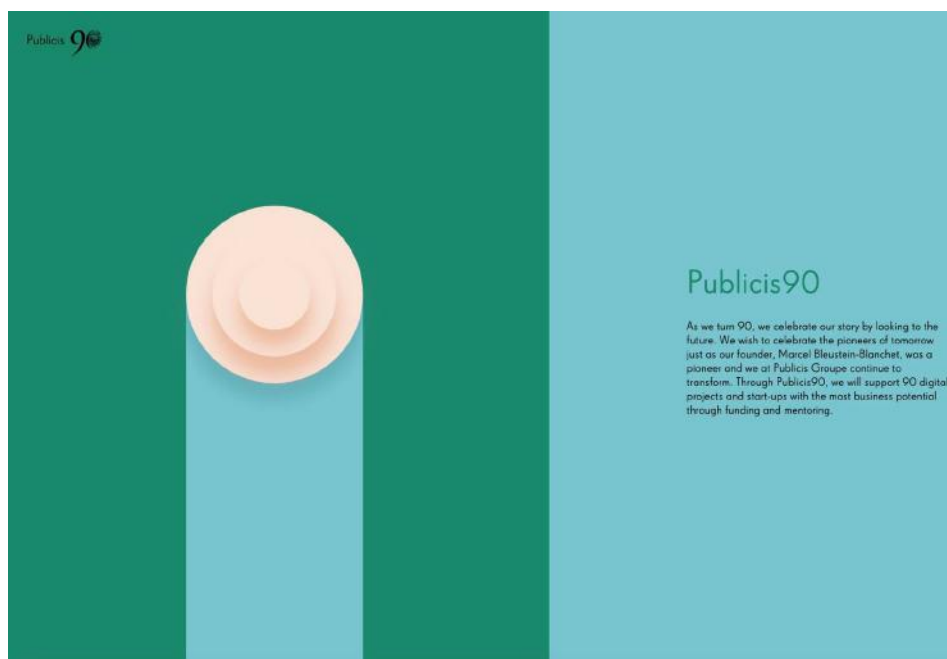
**Google Santa Tracker:**

Unsurprisingly, Google is on the 2.0 bandwagon, and its Santa Tracker page shows off how one can integrate 2.0 in a fun and useful way. The subtleties of 2.0 abound on the page in everything from the gradients and shadows on the various buildings and pop-up bubbles (when users hover on any building) to the headline's 3D impression at the top of the page.



**Publicis Groupe:**

Publicis Groupe’s 90th anniversary page boasts 2.0 influence in a pretty obvious way. If you look at the left side of the page, you’ll see the combination of shadows and gradients coming down and radiating outward from the pale circle and on the blue section beneath it. The stark minimalism also indicates that its design aesthetic is still strongly rooted in pure flat





**Jumeirah:**

This site for a luxury hotel in the United Arab Emirates is mostly dominated by giant video in the background, yet don't let that distract you from taking in the subtlety of its 2.0 contribution. The "Jumeirah Inside" headline features oh-so-subtle shading that successfully gives the impression of 3D while still retaining the overall, flat look.

**An evolution by demand:**

In the design world, things usually change because there's a demand for it. Someone will notice that something's lacking and find a way to improve things, or somebody else will take a concept and take it to another level that logically builds on a certain concept.

As far as 2.0 goes, it's definitely a combination of both, as flat's usability shortfalls are fixed by extending the original concept in a way that still honors the principles of minimalism that flat's defined by.

### 1.1.4 Design Thinking - Sketches: Mate - Logo



**Image link:** [Zibat\\_Blockchain\\_Logo\\_Big-Version](#)

**Image link:** [Merchandise\\_Images](#)

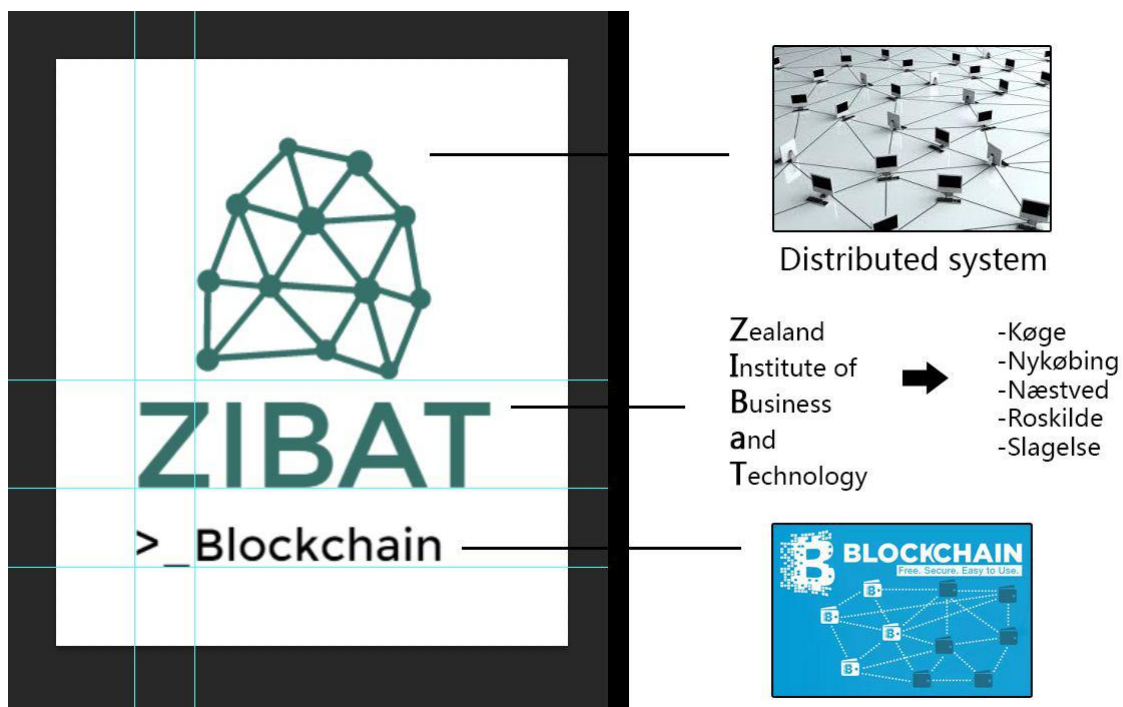
We also made a logo for this project, but at this time we used a designer tool/site to design and edit. We used Square Space [Logo maker tool](#) for this part. It is a good site with a simple tool which is allow you to make logos, sites or slogans and icons easily and simply.

According back to the original site of our [school](#), we decided to put the color from there for our Logo. We mixed a little bit with the “*distributed network style*” (that is the grid with the connections) and we got this simple logo design.



During our [research](#) we realised it is not necessary to design a fancy logo for our blockchain, here in this system and part of the technology is irrelevant how our logo is looks like. The names and titles so much the more. So, we did the same. Our campus name (Zealand Institute of Business and Technology) with the “>\_Blockchain” appellation with the distributed network symbol and a font called “Montserrat”. It is simple and efficient just like the Blockchain.

Actually we skipped that part to make sketches, because here with this topic that is different. The importance of the goals and elements are changed. The final goal or “results” is more important than the elements like the logo. So, that is why the logo looks simple a bit. The technology and the idea are the points of this project not so as the “surface”.



## 1.2 Cms

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> **Coding**      > **DT-Prototype**

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### 1.2.1 CMS Description:



**Website link:** [Zibat Blockchain Community Site](#)

We will need a Portal as a community place. A Social place where the people will meet each other and develop something. Obviously we think in a CMS system. But at this time we need something else than the wordpress or drupal, joomla etc. These are also open source CMS systems, but they are not fit with our specific needs. We will have some angles/points which are really important to keep it mind if we wanna build a blockchain network.

We tried out the most famous/popular CMS systems, but they was not enough about the flexibility. Finally we found a very specific CMS called 'e107'. This system able to fit to the responsive needs, because it is based on the bootstrap framework also. It has many features and advantages. More than five hounded plugins are way more than what we need and we'll use during the editing.

### 1.2.2 Technical description:

e107 is a content management system written in php and using the popular open source mySQL database system for content storage. It's completely free and totally customizable, and in constant development. The e107 website content management system provides all the features you need to build a basic website or a fully interactive web portal.

The website has a user management system, which controls access to the main areas of your e107 web system, which are fully controllable. You can make you some, if not most or

even your whole website totally private, useful for a families, clubs, businesses, intranets, business-to-business and other collaborative projects. The e107 website system is Fully Extensible and has a flexible API system which enables the core features of the system to be extended, without changing the core system code.

### **1.2.2.1 Twitter Bootstrap 3 Ready:**

Day-to-day companion to manage your website through:

- A powerful and intuitive administration area,
- Powerful theme and media managers,
- Community tools (forums, private messaging, polling)
- Full-featured news plugin for sites and blogs,
- Great plugin framework for add-ons,
- Integrated social profiles and shared logins,
- Search engine optimization features...
- Step-by-step wizards for installation,
- Compatibility with most Linux server configurations,
- Simple updating of the core, plugins, and themes,
- Upgrade routines for e107 legacy sites,
- Tools to health check your installation...
- Twitter Bootstrap ready,
- HTML5 and jQuery support and functionality,
- Flexible Plugin Architecture,
- Change the look and feel of your website at the click of a button,
- On-the-fly image resizing for theme development,
- Simple plugin development frameworks for added functionalities

### **1.2.2.2 Check Your Requirements:**

If e107 is to be your platform, you're going to need to hook yourself up with some basic gear.

Here's what we suggest:

### **1.2.2.3 Minimum**

- A Web-Server (Apache or Microsoft IIS) running PHP v5.3 or higher and MySQL 4.x or 5.x.
- FTP access to your webserver and an ftp program such as Filezilla
- Username/Password to your MySQL Database

### **1.2.2.4 Recommended**

- A Linux based Webserver running Apache 2.x, PHP 5.4 or higher, MySQL 5.0 or higher. (LAMP)
- A Registered Domain Name

- Access to a Server Control Panel (such as cPanel)

### 1.2.3 Coding: Mate and Hunor

During our project we used two tool, that was the “*Mobirise*” and “*e107*” CMS. With the first we build the [Promotion](#) site, and with the second the [Community](#) network. Both system is based on the [Bootstrap](#) framework so they are flexible and responsive for any screen resolution. Due to the lack of time we used several tools for the creation of the website instead of coding by hand. Those tools are what we used mostly.

### 1.2.4 Design Thinking - Prototype: Hunor and Mate

Website link: [Bitnodes\\_Live](#)

Website link: [Blockchain API Library \(Node, v1\)](#)

#### Node-blockchain-server

A simple blockchain server that downloads blocks and serves them. It doesn't do state transitions and offers no API apart from the P2P layer.

Originally our plan was to build a fully functional blockchain node as a prototype which is contain and store some example datas. But keep the time in mind, instead we focused on the importances, so the technical or physical part will be done for the exam presentation.



Our future goal with this prototype to make a global community like [Bitnation](#).

## 4. 1.3 Promo

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> [Legislation](#) > [Use-of-Social-Media](#) > [Video-Production](#) > [Written-Communication](#)

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### 1.3.1 Promo Description:



**Website link:** [Zibat Blockchain Promo Site](#)

**Video link:** [How its Made Timelapse](#)

**Image link:** [Behind The Scenes How Its Made](#)

After all of these points we decided to create a Promotion site to make a hyped commercial for our idea. This site will represent our project as a trailer for the people to get to know better our service. This site is a simple HTML site without any extra feature like a cms system. This will just an external surface to advertise our core website the community, which based on the the 'e107' CMS system and cover the essential core of the project which is the blockchain obviously.

This site will describe the Community and the Blockchain service in a nutshell to leave an opened door for the users to discover our system how it is works really is. There will be a short guide how the platform is made and how the layers are merged. The description will contain all the steps what we made with this project and how far we went with it.

You will able to get an image about how this wonderful blockchain technology works and how you could expand this system and how to be a part of it deeper. To make world wide solutions and share it with the others.

The website made with the [Mobirise](#). Despite an endless procession of tools over the last few years, creating a website with any sophistication has remained difficult unless you're

willing to go for a very generic look. Even using a template, getting your content looking like you want it to look and behaving how you want it to behave can be very tough, particularly if you're going to effectively support mobile access (the number of sites that still look terrible on mobile browsers is amazing) and now, thanks to Google, being mobile-compatible is de rigueur if you want to score with SEO.

Mobirise is an OS X, Windows, and Android application that's one of the few easy-to-use applications providing a "mobile first", Retina ready, drag and drop development model. Built on Bootstrap 3, one of the most popular responsive HTML, CSS, and JavaScript frameworks available, the application's user interface lets you select various types of "blocks", place them on pages, and then customize them.

### 1.3.2 Legislation: Hunor

The two licenses that can be applied to blockchain are:

- Creative commons
- GPL (General Public License)

A Creative Commons (CC) license is one of the many public copyright licenses that enables the free distribution of a copyrighted work. It is used when an author wants to give people the right to share, use and build upon a work they have created. CC provides flexibility and protects the people who use or redistribute an author's work from concerns of copyright infringement.

An example for the use of CC license for blockchain:

Creative Commons France experiments with ascribe to support copyleft through the Blockchain



[www.ascribe.io](http://www.ascribe.io)<sup>17</sup>

“Creative Commons France inaugurated the launch of the new website with a new tool that unlocks the value of the bitcoin blockchain for the benefit of the Free Culture movement. ascribe enables creators to share their CC-licensed work without worry of loss of attribution. Creators can then benefit from the following advantages:

- Secure attribution and simple verification
- Better accessibility
- Tracking usages
- Share works easily

The GNU General Public License (GNU GPL or GPL) is a widely used free software license which guarantees end users (individuals, organisations, companies) the freedom to run, study, share and modify a software. A software that allows these rights is called a free software. The GPL is a copyleft license which means that derived works can only be distributed under the same license terms.

<sup>17</sup> Article - [www.ascribe.io](http://www.ascribe.io)



Besides the two above mentioned licenses that can be used on a general term on the blockchain system and its implemented services we wanted to figure out how the law looks upon the blockchain and what regulations, terms are there to keep in mind.

For a more professional look on the subject we contacted a friend of ours, **Ferenc Kasa** who is currently studying at **University of Copenhagen Faculty of Law**.

#### **“Regulatory shift in Europe regarding Blockchain**

The hottest topic nowadays is the more and more space gaining world of blockchain from which neither the EU or it's leading politicians are an exception. In April 2016 the European Parliament held an open door education for its Members in order to educate them regarding blockchain and crypto currencies.

Such an event on a federal governmental level shows us, how fresh and unknown the field is. From a legal point of view, there was discussion on the exact governance of shared ledgers.

What we are seeing now are different types of ledgers which provide a menu of governance options – public law, private law, algorithmic governance or programmable systems/behavior.

This was the very first time that such governance options were presented. And it shows us exactly that Laws also need to catch up to the ever ongoing changes of the world. For example, there's a need to legally recognize the possession of stocks and bonds using shared ledgers, and the finality or transfer of assets on those ledgers.

As analyzed during the roundtables, regulation needs to support innovation, not be overly burdensome and above all, constitute clear policy goals.

It was observed that shared ledgers, cryptocurrencies, further the blockchain were invented long after the regulatory goals which fostered the current regimes were created.

Therefore, what must be kept in mind is whether the current regulatory goals are limiting creative disruption and, if they are, what changes are needed. Also, roundtable participants described shared ledgers and cryptocurrencies as a nascent but disruptive innovation, so that there must be a dedicated effort to identify gaps in current regulations and determine how to fill those gaps without premature or overly burdensome regulation.

While there have been signals to regulate bitcoin exchanges and wallets, it is important to distinguish between custodial and noncustodial wallets and the grey areas of multi-signature custodianship.

Regulators commented that with new innovation brings new risks, but that cryptocurrencies and shared ledgers represent a cheap and efficient global payments infrastructure, the use of which should not be over regulated at this time.

The roundtables explored a variety of topics, such as the need for a government-issued cryptocurrency that enables the instant settlement of transactions, the amount of integration work needed now to implement the technology, and the lack of any evidence that cryptocurrencies pose a systemic risk or are a good conduit for money laundering.

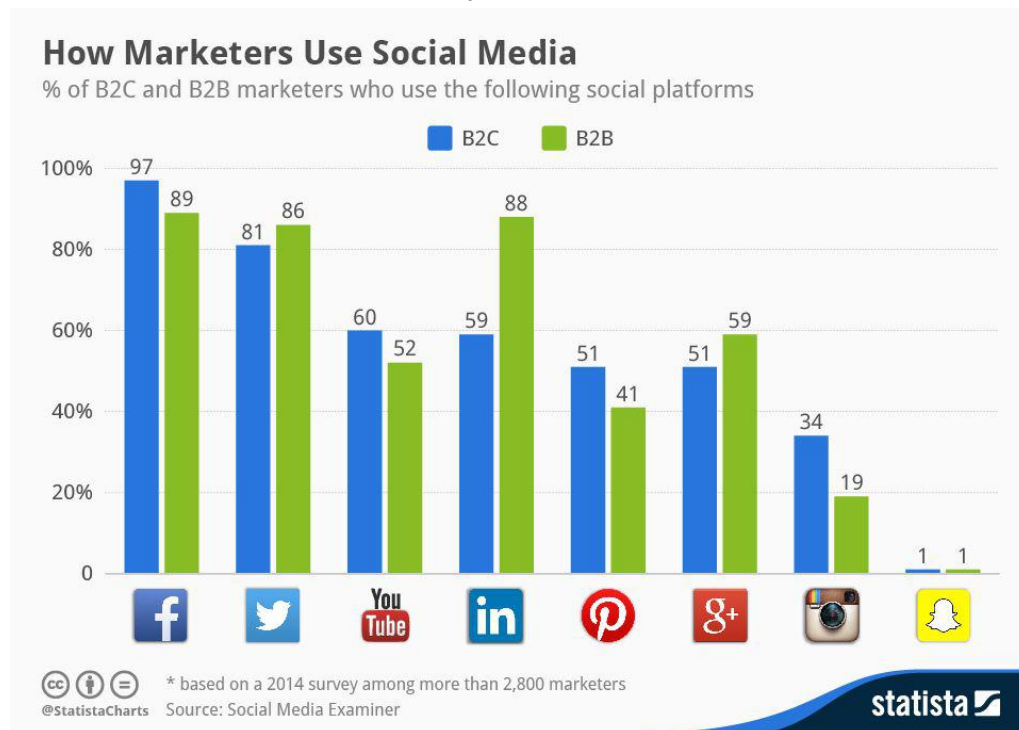
Perhaps the most powerful message of the EU Parliament-hosted conference was that we need a permissionless environment in order to truly innovate, and that premature regulation would only stifle the use of cryptocurrencies and shared ledgers.”

#### ***1.3.3 Use of Social Media: Hunor***

Social media platforms give a good opportunity to share knowledge about the system and its possible use, implementation.

As we made interviews the answers of the interviewees made it clear that the most commonly used social platform among them was Facebook.

The following diagram made by marketers shows 97% of B2C marketers use the world's largest social media platform professionally.



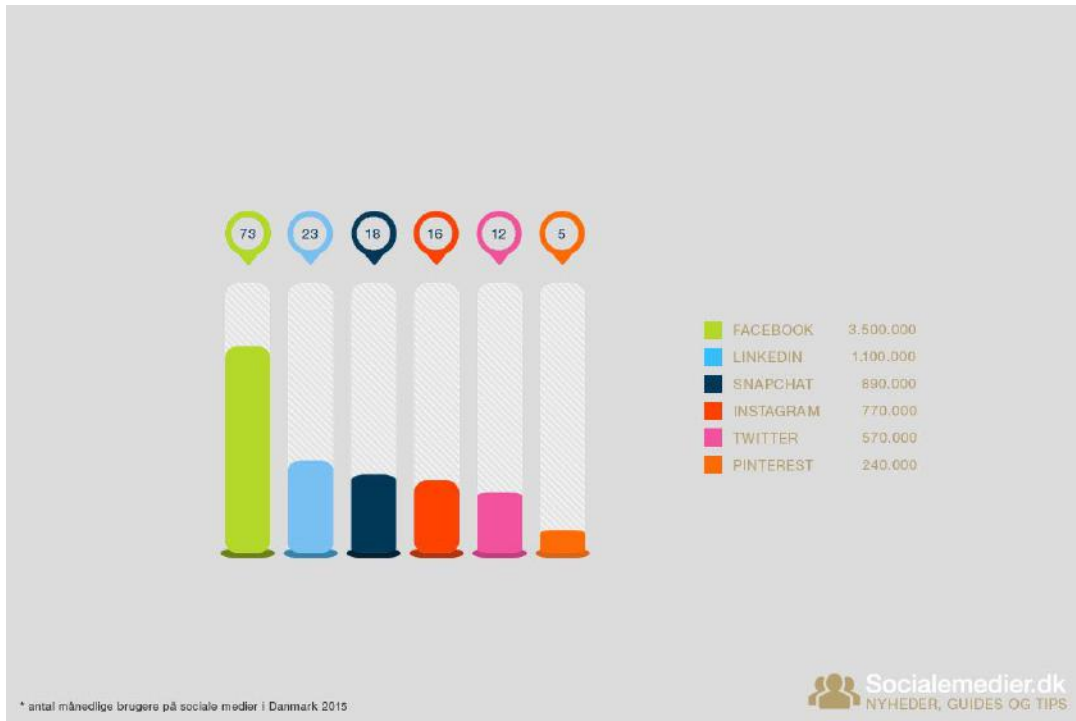
How marketers use social media<sup>18</sup>

Having a closer look at Denmark according to the article of Social media guide for Denmark<sup>19</sup>: there with 3 million Facebook users Denmark's Facebook penetration is 54 percent. Contrary to the high number of users the articles claims that companies have failed to make use of the full potential of the different social platforms. So social media would be used to brand the company rather than interacting with the users or clients.

Another fact is that 73% of all Danes are active on Facebook monthly - meanwhile other social platforms fall behind.

<sup>18</sup> <https://www.statista.com/chart/2289/how-marketers-use-social-media/>

<sup>19</sup> <http://businessculture.org/northern-europe/denmark-business-culture/social-media-guide/>



Sociale medier 2015 i Danmark<sup>20</sup>

### 1.3.4 Video Production: Mate



**Video Link:** [Zibat Blockchain Demo Teaser 2016](#)

**Image Link:** [Image Behind the Scenes](#)

**Image Link:** [Storyboard Scenes](#)

<sup>20</sup> <http://www.socialemedier.dk/sociale-medier-2015-i-danmark/>

We decided to make a <sup>21</sup>“Hype” as a Demo Teaser video about our idea. With other words it is a some kind of commercial to advertise our service. Our goal with this video is that to get some attention to increase the members and the users who they gonna join to this network in the future.

Actually it was not easy to make this part of the project. We planned many things what we wanted to do, but soon it was obvious for us, there is not much time to build everything so we stayed at the “Demo Teaser” instead a “Trailer”. Basically this topic is huge, so it is needed to show and describe the main parts of it. We are on two so we show and we will describe step by step, but it is would be just a minimized description. The whole method is needed more time too. As a school project we decided to present the blockchain in a nutshell, to present the main parts. If we will success, we would like to involve students to start build this network. But now we just focusing the importance.

The first stage was very difficult for us, “what should we show or describe?” In general the blockchain is very new for the people. Most of the people do not know what it is? For example You may heard about Steve Jobs. At least once. You may know who was He and what He did during his life. That is how simple it is. If the subject of a conversation or project or anything else is known You may not wonder about the updates, because You already know the source of it. To follow that line You may understand why is that a little bit more difficult than the other topics, if you want to describe or present. So, it was a challenge for us to figure out what we gonna put into the Demo Teaser.

The first task was that “how to get some material for the video”. Well, it was difficult at first. After we took a deep research how others they do, we found some useful possibilities. The first was to just make a “Flat Design Animation”. For this it is needed to have lots of materials like shapes and other tools, and it is also a huge time to edit piece by piece. So, we skipped that part. The second was to use a simple program which is already contain all of these materials and would be easy to edit with it. Well, it is not worked again. Most of these softwares are licensed so you have to pay for those programs. Or if you have a trial version you will not able to use all of the basic functions. Shortly after this we found a very useful site. This site was the [VideoBlocks](#). We got the hang of it how the [Bitcoin](#) movie trailer was made.

On the site you will find anything what you looking for. In fact you need to type in your credit card number to get access into. It is just a necessary step from the site to prove you are not a robot. They will count 5¢ from your bank account. But it is not a big deal. After this you will able to download from 10k video collection. Most of it have a price, but there is an option if you just looking for the free stuff. Every video resolution is full HD (1920x1080) at least. You will have no problem about the editing part with this resolution range. Sum up everything this site is solved our task how to make the video.

After we came up with the story, I draw down everything, I started to edit. It took appr. 2 day to get the final result what we planned. The story is all about the method how this technology

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<sup>21</sup> **Hype** (derived from [hyperbole](#)) is [promotion](#), especially promotion consisting of exaggerated claims.

could improve the people's need in the real life and how they share this through the network. Just like the Bitcoin did.

We also made some tests, how the people gonna react about the Demo Teaser. So, based on the feedbacks we changed a bit and the final version was satisfying (according to their answers (thanks again Szilvia, Adam, Bence and Petr)). All of them asked that "is it something which is growing?" - Basically that was our goal with it.

Our conclusion with the video is that, the people need to have a little knowledge about the blockchain. As I wrote it is a "must have" thing to understand or just to continue that knowledge. We know that this technology is bigger than a school project, but this video is just another way how we wanted to present this complex system. We took a try.

### **1.3.5 Written Communication: Hunor**

The aim of the promotional website was to make people aware of the blockchain technology and its possible use. There is a basic explanation of the technology and how it could be used and implemented.

The level of the text was adjusted to the possible users being interested in the system. It is worth noting that the website does not give a full in-depth knowledge into the field nor getting into the technical aspects of the system.

## **5. 1.4 Results & Conclusions**

---

> **Tests**                      > **Realization**                      > **Conclusions**

---

### 1.4.1 Results & Conclusions Description:



Here we collected most of the information what we experienced and noticed during the project. We learned several new things which improved our knowledge about topic. Now we know where we are and what could be the next step to push the things further to build something incredible and useful at the same time.

Our vision was that to create a Blockchain network on the school. A community which is totally different than the others or the old ones. A special place where the students have the chance to build things together online and then develop it further. So far so good we made it and we are satisfied with the result. As we wrote we learned so many things especially the technical solutions and it's advantages, there is a lot worth in it.

What we know exactly is that, we need more student to make it real and pull everything to the reality. Community without members is nothing. So, we are looking for volunteers to build this network after this project. Actually in this way you can be your own boss, because this is the start to build something exciting from the ground.

### 1.4.2 Tests: Mate



We also made some tests about our project. We recorded them and uploaded here. We modified the project reflect on these reactions and feedbacks. So, thank you again for those who made our usability test.

**Bence Kovacs:**

*Video link: [Bence\\_Promo\\_Test](#)*

*Video link: [Bence\\_Teaser\\_Test](#)*

**Petr Jiranek:**

*Video link: [Petr\\_Promo\\_Test](#)*

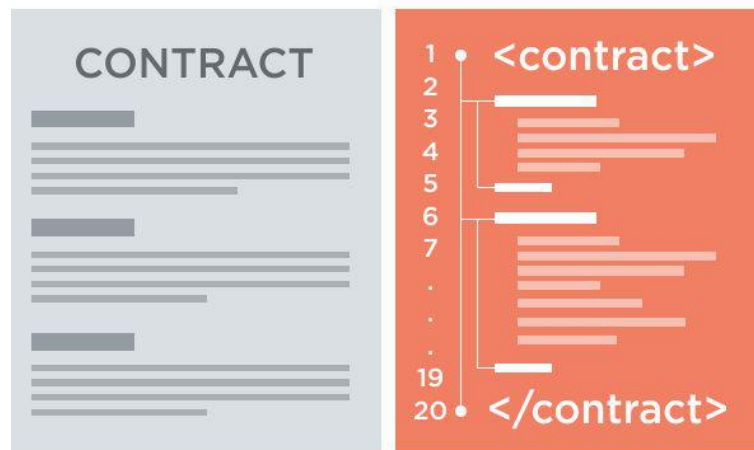
*Video link: [Petr\\_Teaser\\_Test](#)*

**Adam Fekete:**

*Video link: [Adam\\_Promo\\_Test](#)*

*Video link: [Adam\\_Teaser\\_Test](#)*

### 1.4.3 Realization: Mate



Smart contracts are account holding objects on the ethereum blockchain. They contain code functions and can interact with other contracts, make decisions, store data, and send ether to others. Contracts are defined by their creators, but their execution, and by extension the services they offer, is provided by the ethereum network itself. They will exist and be executable as long as the whole network exists, and will only disappear if they were programmed to self destruct.

What can you do with contracts? Well, you can do almost anything really, but for our getting started guide let's do some simple things: To start you will create a classic "Hello World" contract, then you can build you own crypto token to send to whomever you like. Once you've mastered that then you will raise funds through a crowdfunding that, if successful, will supply a radically transparent and democratic organization that will only obey its own citizens, will never swerve away from its constitution and cannot be censored or shut down. And all that in less than 300 lines of code.

Our prototype will be a blockchain system which could contain the diplomas. Like a [LinkedIn](#) profile system, but in this case the school collect and store the diploma's informations. This would be elite, because the school will store the whole datas about your education. For the employers would be so efficiently to hire people for their companies for example. This network going to be perfect with the blockchain.

### 1.4.4 Conclusion:

**Video Link:** [ENVIENTA\\_Sharing\\_Community](#)

As we mentioned we would like to solve real problems with this network not just to build useless services. We would like to focus for big issues such as "energy hunger" or "pollution". Together with this Blockchain technology we could make the change to build something incredible to build a Sharing Community.



As our conclusion, we would like to conclude that despite to the fact of the deadline until which we have to deliver our report we are willing to carry on with the project. We would be following up on our timeline and as our goal to the examination would be to put together a prototype which represents the functionalities of the blockchain system. The prototype would be a blockchain node where student certificates would be authenticated by the blockchain system.

***1.4.5 With this system/network you will able to do the following:***

- Stream lessons
  - Make startup zones
  - Make services & companies
  - Design products
  - Make communities
  - Create groups
  - Develop platforms
  - Distributed system nodes
- ... and much more!

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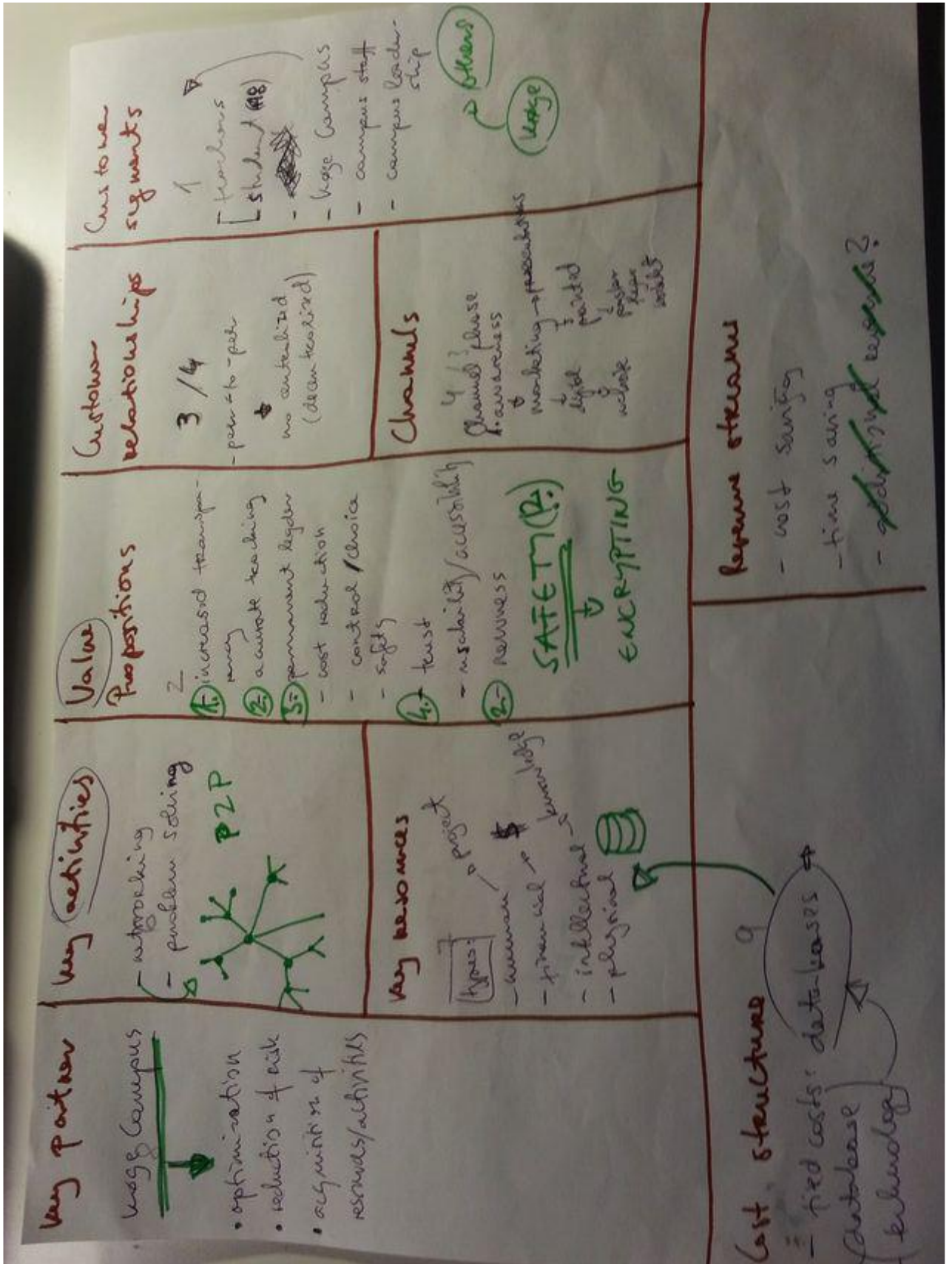
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# Appendix



#### 1.4.5.0.1 Business Canvas Model - draft

#### 1.4.5.0.2 Qualitative Interviews made in Campus Køge and Næstved

Age: 23

Sex: Female

Education: Marketing Management in Næstved

Where do you live? Næstved

What are your hobbies? Fashion, animals, travel

Have you heard about Bitcoin?

- Yes I did.

What is Bitcoin?

- it is like money - you can pay with it on the internet.

Have you used Bitcoin?

- No but it seems interesting so I wanna try it at some point.

Have you heard about Blockchain?

- Yes, I saw an article on Facebook. I saw the headline actually.

What is Blockchain?

- Do not know. Did not read the article. Did not seem any of my interest.

Do you follow any technological news?

- No I do not. I am interested in the latest technologies but I more like to get to know about technologies that affect the environment.

What social media do you use the most often?

- Facebook, Snapchat, Instagram

How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)

- Smartphone, Laptop, Tablet



Age: 24

Sex: Female

Education: Marketing Management

Where do you live? Køge

What are your hobbies? Travel, fitness

Have you heard about Bitcoin?

- Yes.

What is Bitcoin?

- It is a currency. You can pay with it online - it is like a currency.

Have you used Bitcoin?

- No but I would like to try.

Have you heard about Blockchain?

- No.

What is Blockchain?

- Do not know.

Do you follow any technological news?

- No I do not.

What social media do you use the most often?

- Facebook, Snapchat, Pinterest, Instagram

How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)

- Smartphone, Laptop

Age: 23

Sex: Female

Education: Commerce Management in Næstved

Where do you live? Næstved

What are your hobbies? Travel

Have you heard about Bitcoin?

- Yes

What is Bitcoin?

- it is like a different type of money. A some kind of currency.

Have you used Bitcoin?

- No. Someone showed me how it works on a website. And I also saw on a website that it was possible to pay with bitcoin.

Have you heard about Blockchain?

- No, I did not. What is it?!

What is Blockchain?

- Do not know.

Do you follow any technological news?

- Sometimes I see some tech articles on facebook and pinterest. If it is interesting I will read it.

What social media do you use the most often?

- Facebook, Pinterest, Snapchat

How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)

- Smartphone, Laptop

Age: 22

Sex: male

Education: Marketing Management

Where do you live? Køge

What are your hobbies? Gym, football, computer games

Have you heard about Bitcoin?

- Yes.

What is Bitcoin?

- It is a money, it is a currency you can pay with.

Have you used Bitcoin?

- No not yet.

Have you heard about Blockchain?

- Yes I did.

What is Blockchain?

- It is a different network. It is better and safer.

Do you follow any technological news?

- Yes I do. I like to play computer games so I read a lot about games and new things in the technology world.

What social media do you use the most often?

- Facebook

How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)

- Laptop, Smartphone

Age: 21

Sex: Male

Education: Marketing Management

Where do you live? Køge

What are your hobbies? Motorbikes

Have you heard about Bitcoin?

- Yes

What is Bitcoin?

- A digital currency

Have you used Bitcoin?

- No but I would like to.

Have you heard about Blockchain?

- No, I do not know what it is.

What is Blockchain?

- Don't know

Do you follow any technological news?

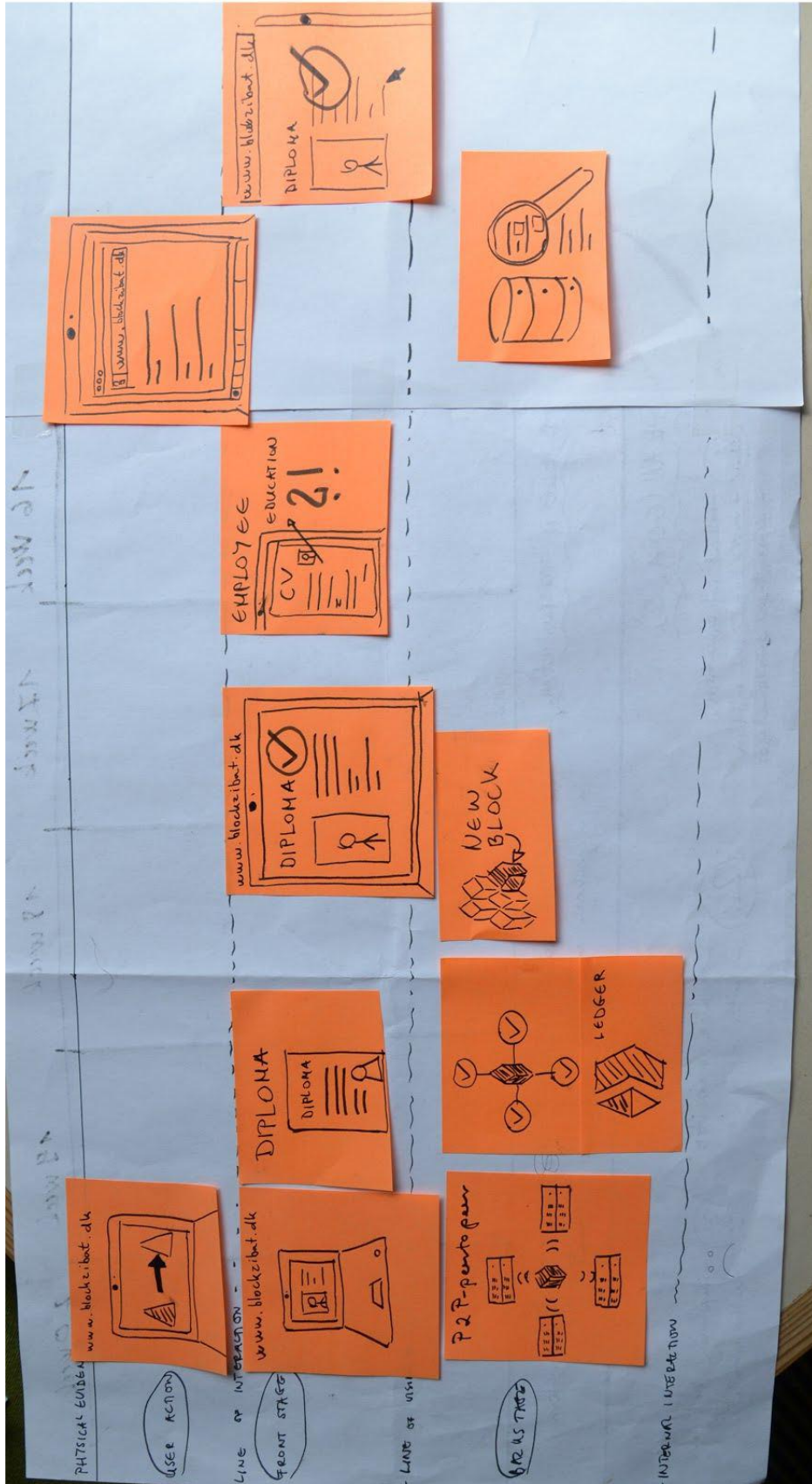
- Yes I read some articles on new technologies

What social media do you use the most often?

- Facebook, Twitter

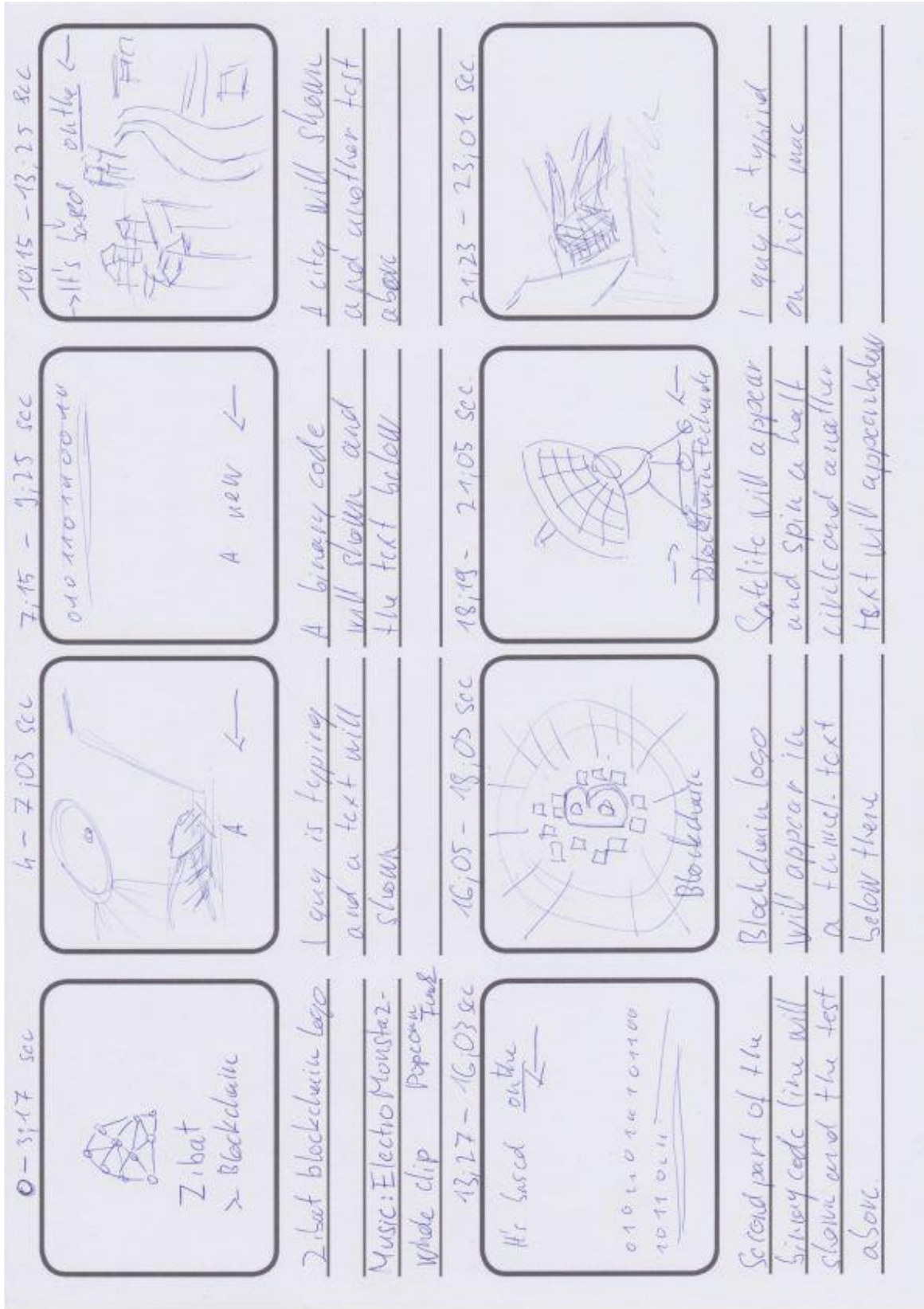
How do you connect to these social medias? (e.a. Phone, Tablet, PC, Laptop)


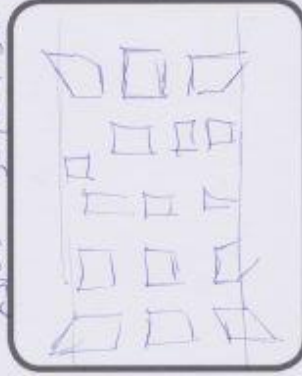






- Smartphone, Laptop, Tablet



1.4.5.0.3 Service Blueprint

Storyboard\_Images:



23,02 - 24,0 sec		<p>A guy with a tablet he is calling SMS "peer to peer" text will appear from the left</p>	29,03 - 30,07 sec		<p>Abstract screen will appear to present a "blockchain" generation virtually</p>
24,17 - 25,21 sec		<p>A girl will appear with a phone. She's typing "Easy" text appear</p>	30,13 - 31,19 sec		<p>Another guy is tapping closely</p>
25,25 - 27,01 sec		<p>Student appear around the desk They are having a chat "Easy" text will appear from the right</p>	31,23 - 32,01 sec		<p>Two girl will appear with a tablet, they are searching. "text" above left</p>
27,07 - 28,29 sec		<p>Counter will appear and counting the blocks number</p>	33,13 - 34,23 sec		<p>Another girl with another tablet she's zooming in the tablet. atext appear</p>

34:25 - 35:23 sec.



A light bubble will appear and stick to the screen.

35:29 - 38:09 sec.



A server will appear and lighting it LEDs "text" in the center.

38:11 - 40:25 sec.



Some people appear and they are walking past "text" still on the screen.

40:27 - 43:09 sec.



Kids are talking around a desk.

43:11 - 45:27 sec.



A woman is typing.

46:01 - 48:19 sec.



A student walking on the ground "text" below coming from the left.

48:21 - 51:09 sec.



Counter again showing the 4051 block meaning.

51:11 - 54:01 sec.



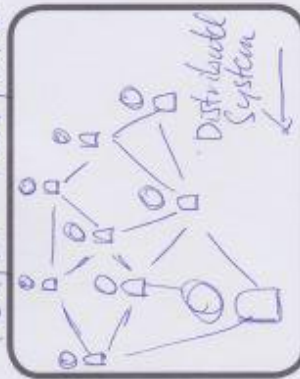
A guy's back showing front of the computer and another guy then in the back of his face.

54:03 - 56:17 sec.



A guy swiping a screen on a tablet

1:04:25 - 1:07:07 sec.



Distributed system grid example with connections  
"text" from the right

56:21 - 59:09 sec.



A girl in glasses searching on the internet, then

smiling "text" from left



A woman in the park with her tablet walking around. "text" come from the bottom

59:11 - 1:01:03 sec.



A similar girl front of the PC searching on the internet "text" from the right

1:10:17 - 1:15:17 sec.



A woman and a guy walking on the highway "text" come from the bottom and right

1:02:05 - 1:04:23 sec.

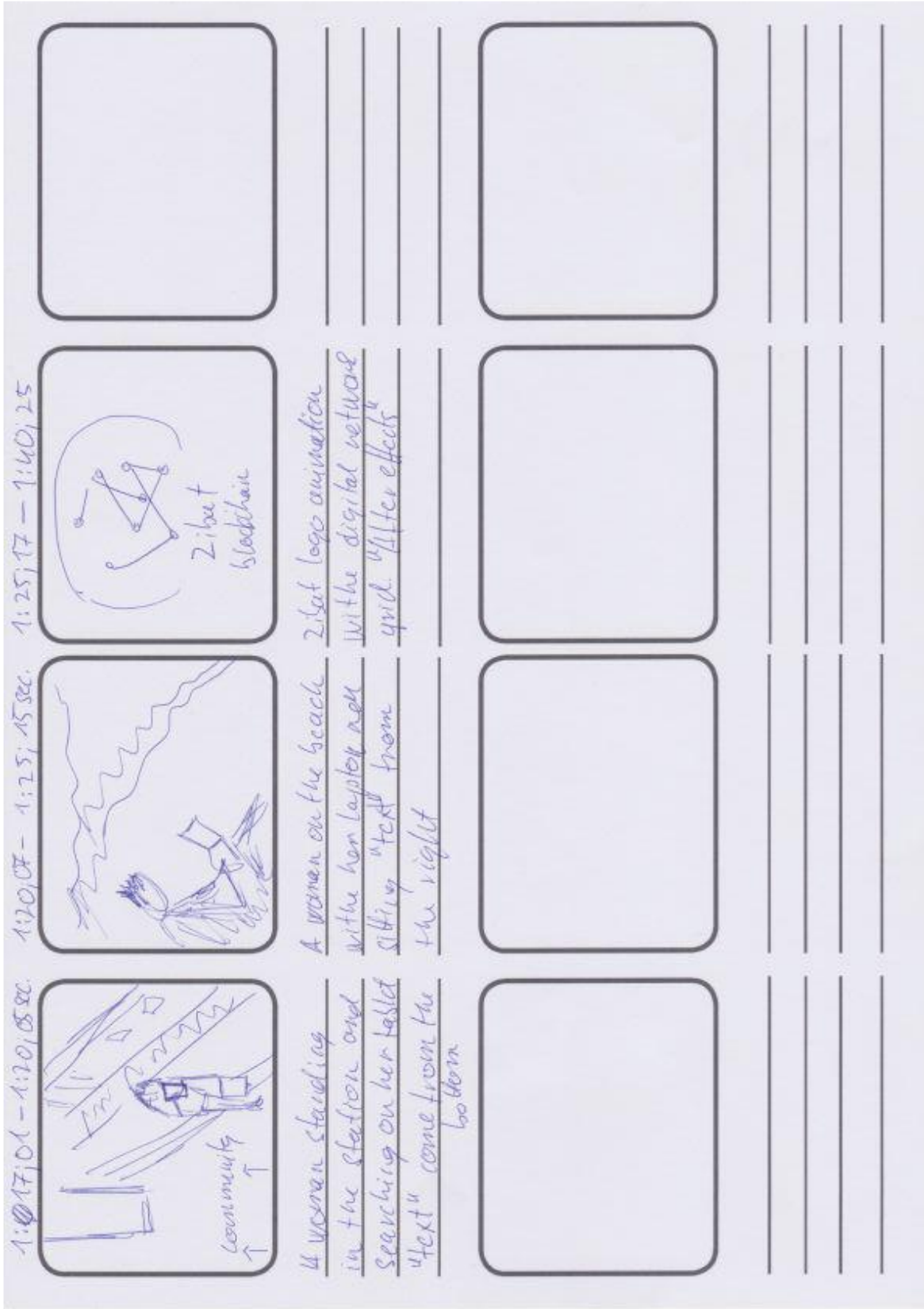


Similar girl #2. camera angle from the left "text" from the right

1:13:19 - 1:16:29 sec.



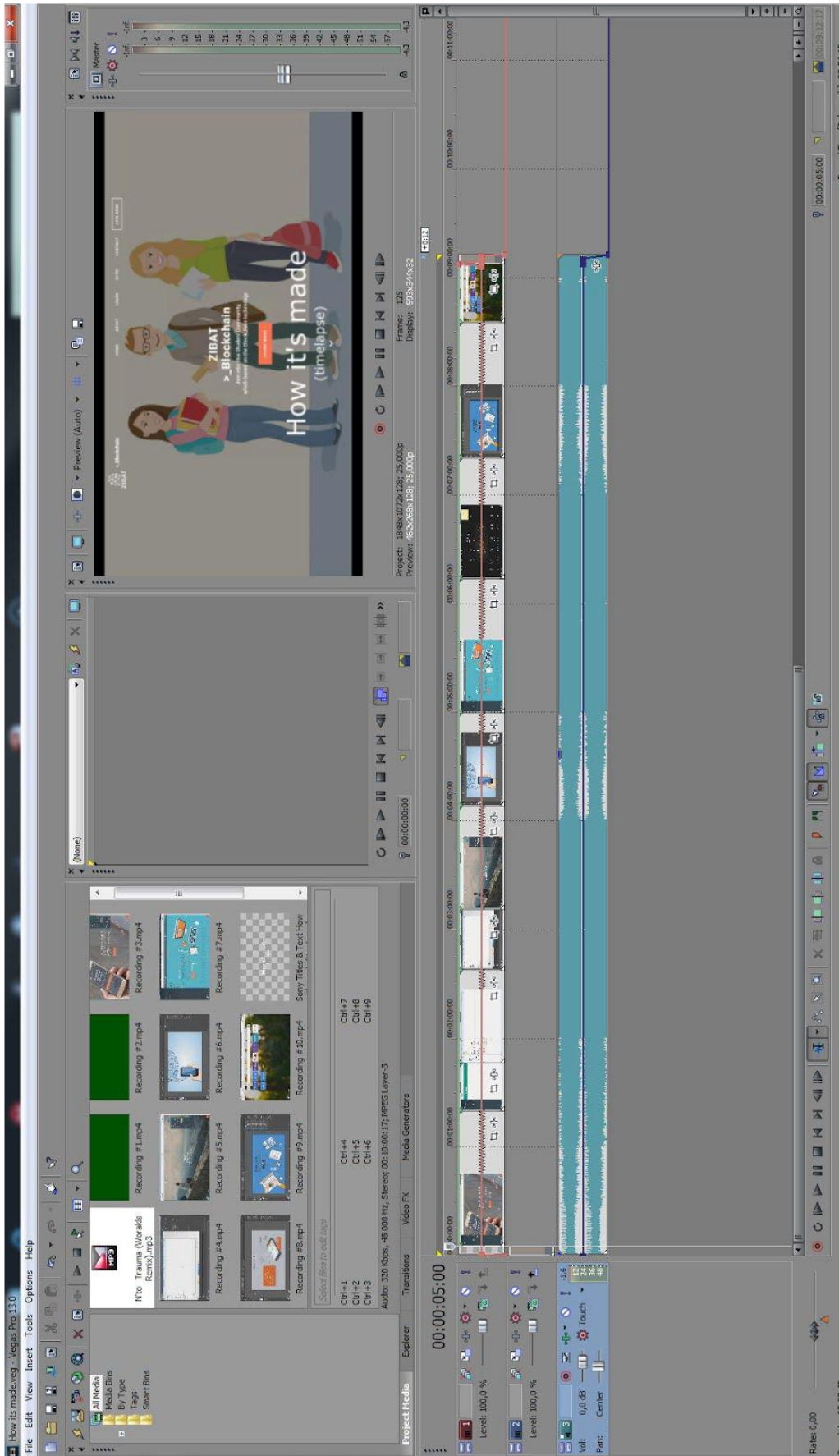
A man standing with his tablet and searching on it "text" come from top left corner



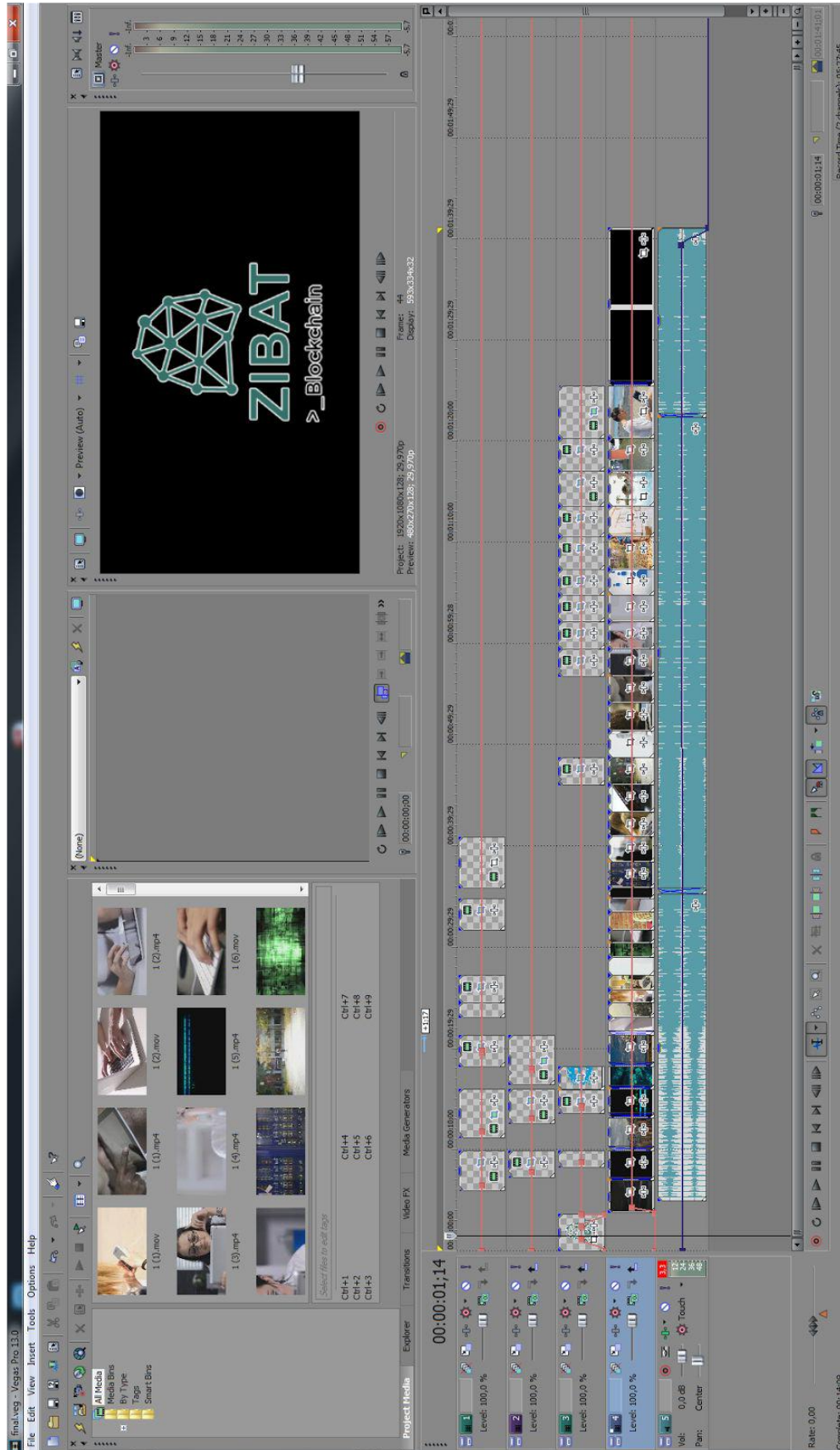
**1.4.5.1**



Behind\_The\_Scenes\_How\_Its\_Made - Promotion\_Site



Behind\_The\_Scenes\_How\_Its\_Made - Demo



Blockchain\_Usercases\_And\_Startups



Blockchain Use Cases: Comprehensive Analysis & Startups Involved

Merchandising\_1



Merchandising\_2



Merchandising\_3







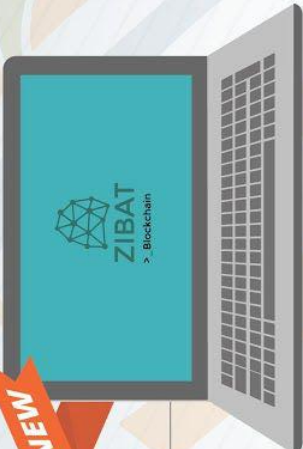





### ZIBAT\_BLOCKCHAIN TIMELINE

- 01 PROJECT MANAGEMENT**  
Money no good and the plan. Who are you going to build this?
- 02 DESIGN**  
A needed design plan to be developed and the architecture to be developed.
- 03 CMS**  
Recommended source of CMS system which supports your requirements.
- 04 PROMO**  
"Who's your" partner to build your ambitions, "where do you want to go"?
- 05 BLOCKCHAIN**  
The core of the steps to build the foundation of the block.
- 06 SERVICE**  
After the blockchain is in place to build the market to ensure the convenience.

### COMMUNITY FOR STUDENTS





### > BLOCKCHAIN FEATURES

- 1 Vision**  
Digital concepts such as Bitcoin rely on an underlying technology called a block chain. This means every transaction made in chain is recorded and stored in a public ledger among peers. This Shared Ledger approach could streamline a plethora of different services, both in government and the wider economy.
- 2 Governance & Regulation**  
Both the legal and the digital spheres are governed by rules, but the nature of these rules is different. The digital world has no lines legal code and infrastructure but the chemical code regulate activity. The impact of both have to be considered in setting out regulations that cover distributed ledger systems.
- 3 Security & Privacy**  
There are many different types of distributed ledger systems, each offering various security and privacy features. The level of security and privacy requirements of any proposed implementation before deciding which type of ledger to use.
- 4 Technology**  
Physical cash is unlike any other form of money. It is a tangible asset that can be held, stored, spent, the production or partition of any third parties such as banks or governments, given and it's blockchain have shown us how to peer-to-peer and the opportunities of this digital technology are much broader.
- 5 Applications in Government**  
Distributed ledger technology is already having a significant impact on government. Governments are exploring it, applied within government it could reduce costs, increase transparency, improve citizen services, and stimulate economic growth. This chart contains five case studies that illustrate those benefits.
- 6 Disruptive Potential**  
Distributed ledger technologies (DLT) represent a significant challenge to existing business and governance models. Technical innovation and the potential for disruption are likely to be most pronounced in those areas, ultimately causing major changes in the way in which the economy and society itself is organized and governed.
- 7 Global Perspectives**  
Organisations that do digital business, in particular, must be able to trust - and be trustworthy - in their partners. They also need to be able to trust the data they receive from the multiples of other organisations around the world. Block chain have the potential to contribute to both.

### BASIC FEATURES:

- THESE ARE SOME FEATURES WHY THIS IS THE BEST OPTION
- MARKET: THE MARKET OWNERS ARE AS A PART OF THIS STUDENT NETWORK



# Zealand Institute of Business and Technology

DIGITAL MARKET

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# HOW THE BLOCKCHAIN WORKS

## The bitcoin illustration



Anna buys a book online.

Her online book retailer accepts **bitcoin** and Anna already holds a bitcoin wallet.

The retailer sends Anna its bitcoin **address** (a chain of 26 to 35 characters).



Anyone can verify the transaction, with the public key.

Anna sends her payment to the address of her retailer. She signs the transaction with the private key of her own address, created for this given transaction, and adds her own public key to the transaction.

To ensure **privacy**, addresses are usually different for each transaction. An address is linked to a private key and a public key.



Blockchain\_Payment\_2

**This is where the miners come into play.**  
Miners are techy blockchain enthusiasts, located all around the world.

Transactions are recorded in **blocks**. The ledger is a chain of blocks. **Blockchain is the realisation of a public ledger.**

The blockchain, shared in real-time on the miners' computers, stores the record of all confirmed bitcoin transactions.

As a new block is created every 10 minutes, modifying a recorded block would require modifying all the following blocks, which is nearly impossible.

**A block contains the hashes of the previous and current blocks, and a 'nonce' (a random number).** All blocks are linked to one another. It can be viewed as a wax seal.

To store a transaction in the blockchain, miners' computers create cryptographic **hashes** (strings of letters and numbers).

A hash must look a certain way (starting with a number of zeros). **Miners must generate many hashes before finding a successful one.**

The successful miner is **rewarded** in bitcoins.

Anna's transaction is now complete and verified!