PHASE 4

Build or Reuse… and Refine

begin blockchain

enabling new growth for sme's

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the Erasmus+ Programme of the European Union

CONTENT

01 Disclaimer 3

02 About this Document 4

03 Summary 5

04 Different Options For L1 & L2 6

05 Resources 8

06 Establish your Learning Goals 10

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the Erasmus+ Programme of the European Union

DISCLAIMER

01

Project **BEGIN (ref. KA202-9980B432)** has been funded with support from the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

ABOUT THIS DOCUMENT

02

In this phase, the students need to evaluate the decision of building a new piece of technology (not a new blockchain but maybe a new protocol or DApp), or reuse or build on top of existing ones. If the solution is simple and the resources or initial funding small, reusing can be the right option.

Further:

- In the case of a public DApp, the incentives model needs to be defined and tested here.
- In the case of private/consortium, the rights and obligations and roles of the participants in the business network need to be clearly specified.

SUMMARY

03

In this phase, you need to evaluate the decision of building a new piece of technology (not a new blockchain but maybe a new protocol or DApp), or reuse or build on top of existing ones, to go through a study of concrete alternatives, and to assess their level of adoption or maturity.

If the solution is simple and the resources or initial funding small, reusing can be the right option. Also, any other decisions regarding user engagement and experience need to be analyzed at this moment.

Further:

- Which particular blockchain/solution? Which are the costs and benefits of existing ones and their degree of maturity?
- Are there specific existing protocols that provide interoperability or standardization to my solution?
- How will the user experience be devised? If the DApp needs wallets, which will be supported? A mobile version is needed?

This phase is also intended to refine and give more level of detail if needed to the outcomes of the previous phase.

This step moves to the concrete and focuses on feasibility. In the blockchain space, most of the technology is open source, but this does not mean that everything is ready to be used or mature.

The end of this stage should be a concrete implementation plan, focusing on cost control and evaluating if the team has the skills to build or it is preferable to reuse.

The decision point to move to the next step is having a clear plan and commitment with particular technologies. This is the logical step after selecting the type of blockchain in the previous step.

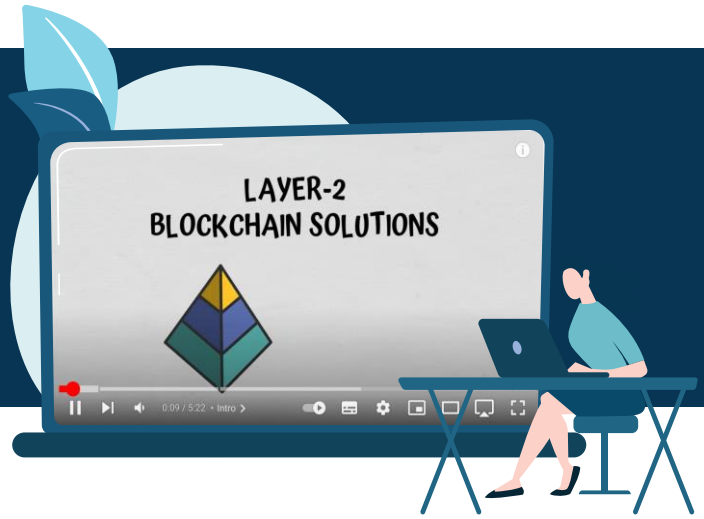
A fundamental concept here is that of reuse. There are many functionalities in different blockchain applications that have become what is often called in the space “primitives”.

DIFFERENT OPTIONS FOR L1 AND L2

04

*The first important concept here is using **Layer 1 (L1) and Layer 2 (L2) blockchains** and the security, maturity and decentralization/security.*

This video gives an overview of the topic



The basic problem in the public space is that L1s (as Ethereum) are expensive to use and slow for some applications, and there is a wide variety of solutions that build on top of them to give more speed and lower fees. However, in the blockchain space, this is always a tradeoff, and the critical point is to understand how the particular solution and tradeoff chosen affects our users and if this appears to be acceptable for them. It is possible that the discussion on L1 and L2 may have already appeared in the previous stage. In that case, this can only be a check or validation.

If the solution is based on **PUBLIC, PERMISSIONLESS BLOCKCHAINS**, review the following:

- Do you need tokens? Of what kind? Which is the particular role of each of them? Are there standards or best practices for them?
- Do you need governance structures? That should be clear from the previous step, but now it is time to go to the specifics.

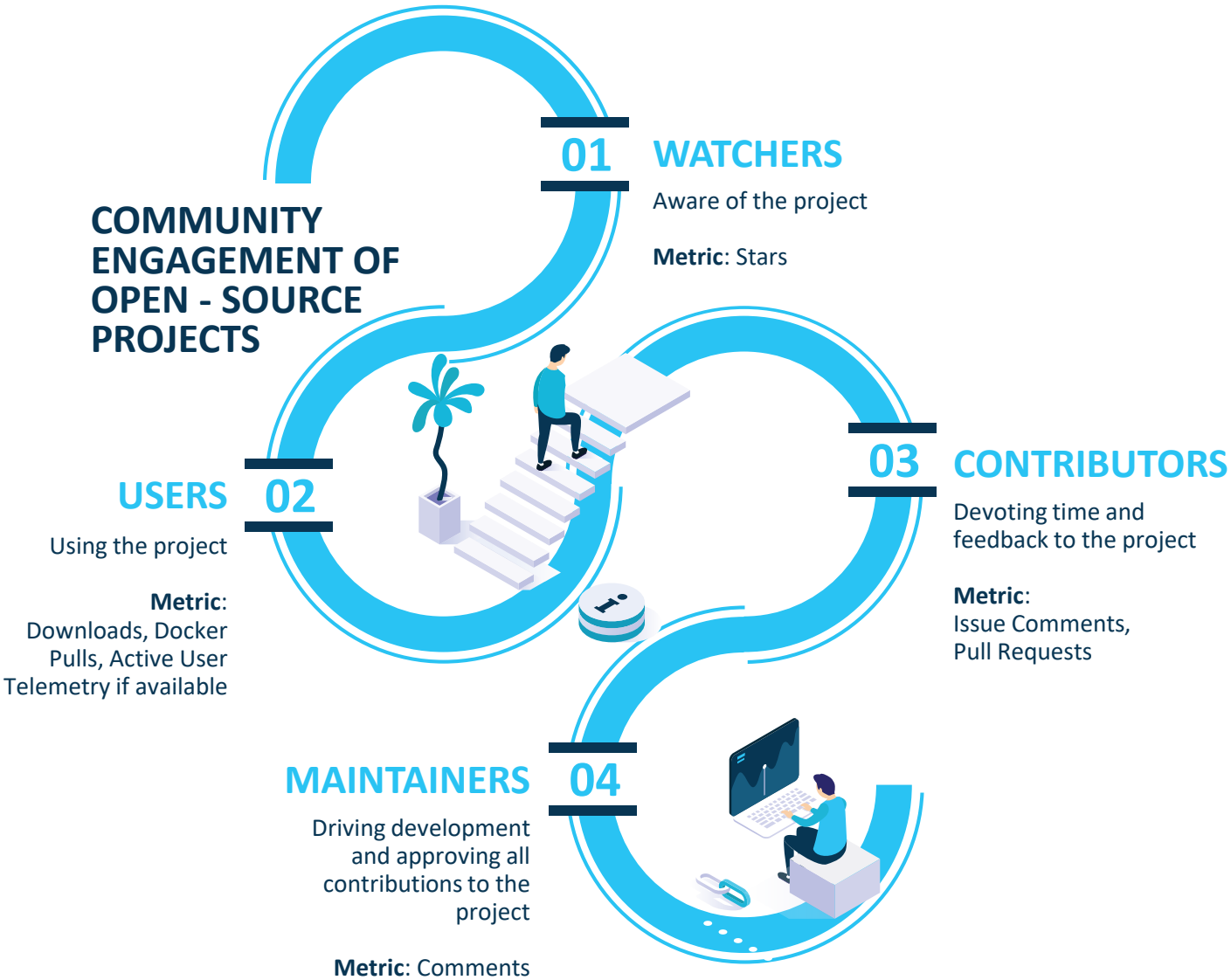
Now it is time to move to the **"COST STRUCTURE"** section of the MVC and introduce the details of the infrastructure costs. There are two very different analysis in these two cases:

1. In the case of a public permissionless DApp, typically, those costs are for the users of the solution, not for our company.
2. In the case of private or consortium blockchains, the costs are often sustained by the participants in the business network (yet defined in previous stages), but now it is time to go to the concrete numbers

After the discussion, it should be clear if there are problematic issues with the infrastructure costs, and this phase is fundamental to move from concept to some workable plan for implementation.

While different teams would be able to come to different levels of depth in the technical definition, it is essential to move as far as possible. But it is important for the instructor to avoid the team getting stuck in the technical details. Once the problems and some alternatives are known, open technical issues can be tackled later, eventually when the startup or project has acquired the technical skills or hired the technical team.

Another important element to consider here is the level of maturity of different solutions, L1, L2 or both. Since these technologies are open source, this is an example resource that considers aspects of OSS projects:In that resource, a key element is community engagement.



While not an exact science, these insights can show us that the project is healthy. Of course, this is in addition to other apparent measures specific to the blockchain space, such as the number of nodes in the network, volume of activity measured in transactions or number of developers working in a project for that blockchain, to name a few.

RESOURCE 1:

Smart contract standards

If your solution entails some form of token, it is important not to reinvent the wheel and comply with standards. These are actually "community standards" as they are not de iure standards curated by international bodies as ISO.

They are proposals that stem from the community of developers, and some of them are widely adopted. For example, the vast majority of DeFi is built on top of the ERC20 token standard, which allows for the interoperability of tokens.

The first and most prominent example is that of popular "token standards" in Ethereum. While they come from that particular blockchain, they have become popular, and you can find similar "standards" in other blockchains.

If the team has no technical knowledge, understanding the technical side of those standards may seem daunting at first. A possible way of overcoming initial fears is to understand how a token can be "programmed" very easily by using existing open-source libraries.

OpenZeppelin, a company devoted to creating smart contract libraries and associated tools, provides a playground to reuse their libraries to create tokens. The trainer may, at this point, provide some technical hints based on it.

You must consider which standards are relevant at least in the following situations:

- If your solution entails tokens, be them fungible or not.
- If your solution needs some form of governance or DAO.
- If your solution needs to reuse components from DeFi protocols, e.g. if you need some form of compatibility with DEXes like UniSwap.

RESOURCE 2:

Planning the user interface

In almost every digital business, there is some form of a user interface, which nowadays is typically either a Web or mobile interface or both

Blockchain applications are not different in that you would need to plan for hiring a frontend developer that is fluent in some of the typical "frameworks" the following figure shows some of the most used ones nowadays.

But in the blockchain space, you need to plan also for supporting different wallets. For example, the following are some of the ones that support Ethereum.

Understanding wallets and the usability of the interaction with the blockchain is important to devise the user experience. This needs to be considered in the solution. Account must be taken for the fact that "regular" Web or mobile developers, or designers require some insights on the blockchain practicalities.

This is, in general, not a big deal for a developer, but it is important to consider that to avoid confusion and lack of fit of the design to elements as fundamental as that part of the interaction may be mediated by a wallet.

This needs to be considered in advance, and this is the right moment to attempt to devise some user interface sketches, even if they are just drawn on a piece of paper. This is important as part of the MVP, since it makes tangible the concepts that have been considered so far.

ESTABLISH YOUR LEARNING GOALS

06

*At this point, you will need to have a **plan for implementation**. This requires a decision to go through a new cycle of this stage (right-hand side box below) or to finalize this and progress to Stage 4 in the group's next meeting. The trainer should not bias the decision on iterate or progress, but any missing elements not discussed that may affect that decision should be raised. Here it is crucial to provide some technical support to the group if needed to choose the technology.*

THE DECISION OF THE IMPLEMENTATION PLAN IS CLEAR

- At this point, while not required, it would be helpful to present your implementation plan to some technical expert, if available, at least once before moving to the next stage.
- It is also expected that you have some rough sketches or low-quality prototypes to show end-user functionality to potential users or investors.

THE DECISION OF THE IMPLEMENTATION PLAN IS UNCLEAR

- Time to pivot the implementation plan!
- Prepare your list of learning goals for the next round of this stage.

www.beginblockchain.eu

begin blockchain

enabling new growth for sme's

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the Erasmus+ Programme of the European Union

national enterprise network

momentum [educate + innovate]

European E-Learning Institute

Universidad de Alcalá

TARTU ÜLIKOOL

UIIN University Industry Innovation Network