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ABSTRACT

ZERP is a platform for decentralized Open Source Intelligent ERP solution that utilizes the advantages of blockchain technology.

VERP is a core component of VERTEX; an existing traditional ERP software that has been operating over 25 years, with over 6,000 users. ZERP is the new generation ERP that uptakes the best features of VERP and utilises disruptive technologies for the benefit of all kinds of enterprises and their future needs.

As a decentralized platform, ZERP's foundation is based on the decentralization of actors which is characterized by the ZERP's coins called "Zygots."

ZERP has 'lightweight' character which offers accessible and affordable decentralized ERP architecture available for all company sizes - micro, SME, corporate, and institutional.

We are introducing a dashboard and ZERP engine that will provide the benefits of blockchain-integrated ERP systems to users and collaborators with various budgets, profiles, and needs.

By integrating the EOS blockchain's peer-to-peer networking, distributed validation, and smart contracts to ZERP, we aim to build the ZERP platform that is generic enough to cover the entire supply-net of diverse domains and businesses and become the unifying ERP platform of the business ecosystems of the future.

We aim to completely revolutionize the ERP systems using the Blockchain and EOS technology.

"Zygot is [the team](#) that designed and facilitates the development of ZERP decentralised platform"

1. Introduction

What is ERP?

ERP is an acronym for Enterprise Resource Planning, but even its full name does not shed much light on its entirety of operations. To understand ERP, one must scrutinize all the processes necessary to conduct business, including inventory and order management, accounting, human resources, customer relationship management (CRM), etc. At the most basic level, ERP software integrates these functions into a complete system that simplifies processes and information throughout the organization.

The central function of all ERP systems is a common database that supports multiple functions using different business units. In practice, this means that employees in different departments, such as accounting and sales, can rely on the same information to meet their specific needs.

Timeline of developments towards ERP

ERP systems have become a core part of the business landscape. They help companies to smoothen out their business processes and to efficiently manage operations. Here's how they evolved through the years:

1960-1970

With the increase of modern factory production and computing being born, a need to manage and balance production and customer demand arose. Afterwards, a software known as Materials Requirements Planning - or MRP was designed. Even though these programmes were in an early stage, they helped plan manufacturing, purchasing and delivery. They also made it easier for companies to keep their stock levels low, which sequentially reduced the amount of funds being "locked up" in their inventory.

1970-1980

By the year 1975, there were already 700 companies that were running MRP. A downside at the time was that it could only be afforded by large manufacturers and corporations and ran on enormous mainframe computers that didn't even have the computing power of a present-day smartphone.

MRP software companies main goal was to create a business software that worked in real time. In a time of punch cards, real-time working was something that hadn't been done before.

Financial management software was being developed at this time too by some companies, albeit in isolation from other systems.

1980-1990

In the 1980s, MRP was developed a lot and grew in effectiveness. Later it became what was addressed as MRP II - Manufacturing Resource Planning. This added more manufacturing processes and greater capability, especially around capacity requirements.

1990-2000

The abbreviation ERP (Enterprise Resource Planning) was first used in the 1990s by the Gartner Group. This "term" described software that extended MRP and MRP II to enclose other features that had to do with a company's "back office". It included features such as engineering, finance and accounting, HR and project management.

By the mid-1990s, ERP software was available from suppliers such as SAP, Oracle, JD Edwards and Baan, addressing the core functions of a company.

With the approaching concern of the Y2K bug and the forthcoming debut of the euro, companies in the 1990s rushed to update their legacy systems. Many companies entirely updated their old systems by accepting the new ERP solutions.

Later, in 1998, NetSuite was founded, with the ambition to create a system that works across a company and will be delivered over the internet.

2000-2010

In the year 2000, the Gartner Group again played a part in the history of ERP when they introduced the description of ERP II. This was internet-ready software that gave real-time access to the ERP solution. It was also imagined that it would provide such functionality that would help a company to integrate with other systems outside of their own. This was planned by the integration of supply chain management, customer relationship management (CRM) and business intelligence.

During the early 2000s, interaction via mobile devices evolved and more web-based functionality emerged. Furthermore there was also much consolidation of suppliers. A number of mergers and acquisitions saw the industry transform and go into the 2010s to become dominated by a much smaller number of vendors, including Microsoft, Oracle, SAP, Infor, Sage and NetSuite.

Present time

The modern ERP systems have become state-of-the-art technology. They are mostly cloud-based, delivered via the software as a service (SaaS) model, they have remote access through apps that run on smartphones. Also, they are exceptionally flexible and every vendor's tool is customized and different. Each application provides the company with a capable, dynamic, real-time tool that runs a shared database of information for the entire enterprise. Modern ERP solutions not only focus on manufacturing, supply chain, and financial and accounting capabilities, but they also envelop other areas. Modern ERP systems have: advanced reporting and business intelligence; sales force and marketing automation; CRM; ecommerce; and service and warranty management and much more.

1.1 Our Vision

Zygot is bringing the benefits of tailored software solutions to all companies, regardless of their size, with regards to their needs.

1.2 Our mission

Conceptualize, design, facilitate and sustain an ecosystem and mechanisms for decentralized stakeholder co-competition - with international scope in diverse domains of software development, application and advancement.

1.3 Our goal(s) with ZERP:

To make a blockchain-powered, global, inclusive for all company sizes, domains, industries, ecosystems, affordable, community-improved, collaborative and sustainable ERP modular solution - ZERP.

2. Problem Analysis

2.1 Problems

"In 2018, manufacturers and distributors around the world will embark on the process of selecting an ERP system. Whether it's the first ERP system they'll install or an upgrade from a legacy system, the selection and implementation will be a significant undertaking. The main issues they face with existing software companies (i.e. centralized) is data leaks (example), data manipulation, and company transparency.

The challenges encountered by existing ERP solutions are;

- Inefficiency
- High Initial and Maintenance cost
- Data vulnerability (Data leaks and manipulation)
- Trust
- Adaptability
- Modularity
- Difficult Integrations - lack of standards, and protocols
- Dependence on single provider

The cyber-attack against small businesses, especially manufacturers, is increasing. The recent Symantec security report showed that small companies now account for 43% of all cyber-attacks and that manufacturers are among the largest.

ERP systems can be a particularly vulnerable target because they contain some of the most critical data of the businesses. ERP systems also serve as a business data centre that connects to other systems, customers, suppliers, mobile employees, and purchasing machines.

Incorrect ERP security role and profile designs can create security access combinations which can create unauthorized or back-door access to a system allowing for fraud or misuse of data

Compromised data is bad. Security breaches that shut down operations are arguably even worse. That is what cybercriminals can do if they gain access to your ERP system.

Involved exploitation of ERP vulnerabilities poses a significant threat for any business that relies on its ERP system—which would be just about every business.

2.2 Solution

Integrating Blockchain into ERP solutions

The disruptive profile of the blockchain technology should allow reliability and security in the development and use of the ERP software. The blockchain technology enables registration of the operational transactions in blocks, and due to its decentralized nature, data can be shared across a p2p network.

Due to the immutability of the blockchain technology, existing data which are held in blocks cannot be altered or manipulated, as the blockchain platform provides safe chronological evidence for every transaction.

Blockchain enables easier tracking of transactions and improved privacy, efficiency, transparency and greater confidence for ERP-solutions system. Using blockchain technology in ERP systems allows greater control in the utilization of the existing company data regarding generation and transfer of new information into a distributed ledger.

Cloud Blockchain ERP

Cloud blockchain ERP primarily perceives decentralized platform of databases with integrity to which the users can access in real time from any location. Scalability and security are qualitatively new transformative content that differentiates decentralized blockchain ERP from on-premise ERP. ERP structured in this manner employs greater developing efficiency and agility in the process of business decision-making and business process re-engineering, responsive to the dynamic changes in the global competitive environment.

The ZERP concept is founded on developing a broad ecosystem that includes integration of many users to the blockchain platform where they can freely use their ERP applications, develop the functionalities and more easily articulate their needs connected with the ERP used. This refers to the implementation of innovative and more advanced ERP solutions to a functional ecosystem based on the new blockchain technological paradigm as a source of added value for the companies.

ZERP will be an open interoperable software powered by EOS blockchain system where the companies will be able to have access to a more sophisticated ERP software. The peer-to-peer network configuration of the blockchain will allow the peers in the chain to permanently qualitatively improve the software, and develop and strengthen its performance and functionality.

The provision of open access ability to quality and more sophisticated ERP solutions is especially important to those companies who have limited financial resources, and limited availability to purchase expensive commercial software from the big ERP providers. Considering the benefits of using of ERP systems in increasing efficiency and agility in the business management, the attractiveness, and interest to use open source or CRP increase. Gartner research confirms these tendencies of substantial investment to use open-source software. Their investigation of 547 companies shows that nearly 46 percent of organizations have deployed open-source applications for specific departments and projects and 22 percent of the surveyed businesses use open source consistently across all departments. While lower cost of ownership remained a significant factor, at 29 percent, nearly one-third of executives cited flexibility, increased innovation, shorter development, and faster procurement as reasons for picking open source over proprietary software.

In our preliminary investigation, the companies prefer the cloud ERP option as more attractive. The advantages of distributed and decentralized ERP is in the direction of reduction (or no) investments in own computer infrastructure; no licenses for software use; avoidance of the expenses for software maintenance; possibility for upgrades of the open source code; feasibility for access from various geographical locations; greater security, scalability, and elasticity of the system; reduces counterparty risk.

EOS Blockchain and Smart Contracts

In order to reduce the misunderstandings between the providers/implementers of the ERP software solutions and the clients, a decentralized system offers several improvements. The EOS operative system, its decentralization, its dispersion as well as possibility to use smart contracts, gives remarkable opportunities to overcome the challenges being faced by ERP solutions. The ERP software solution will be Open Source, which can be updated and maintained by, independent software teams, independent implementation teams, and the clients who are many (many-to-many, not one-to-one). In such a decentralized system for which the perfect solution is EOS, the users will be able to use various implementation teams for the same software solution, also use multiple units for software production and different for software updates. We will create a dashboard on which the users will publish their needs as well as state how many tokens will be transferred to the implementation team, the cumulative number of tokens offered from many users with the same requirements will be the incentive for the teams to uptake an assignment and fulfill it with best possible quality. That will maintain high level of motivation, quality and user service as well as mechanism for improvement of the ERP on a continuous basis.

When a team considers the number of tokens sufficient for their work, they will be able to complete the task and obtain the tokens, on the first-come-first-served principles. This allows decentralization and liberation of the process of acquiring, production and implementation of any software solution. The teams that would work on maintenance and improvement of the software based on user needs or its application would have to stake a certain number of tokens and will be in a position to uptake tasks that are in number maximum 20 times higher than their frozen tokens. The smart contract will allow distribution of the tokens to the team who has completed the task, if and only if it is done correctly and with the expected quality. The teams who receive negative references for lousy performance will not be able to uptake future tasks or assignments or will be excluded as teams from the decentralized systems. Such framework, based on blockchain technology would allow more fair competition (collaboration and competition) and the position of both providers/implementers and users.

3. Why the Blockchain technology and EOS?

3.1 Why blockchain?

Blockchain technology is characterized by five attributes which makes it the go-to technology which can completely revolutionize ERP solution systems.

These attributes ensure the solution is scalable, compliant, and flexible to incorporate newer requirements, and have privacy and security.

Permissioned and Private:

This attribute writes records exclusively for member and any third party can be granted access and/or excluded from general access. The permissions can be architected to specific data as required for the application.

Transparency through decentralization:

As the information in the block once verified is copied to every node, there is absolute transparency with access based on permission.

Immutability, irreversibility, and data integrity:

Records in the nodes are cryptographically secured, with no possibility for anyone (without key access) to change the data, so there is no threat to data integrity.

Scalability:

As it uses shared computer capability and servers, it has the ability to secure billions of transactions. As the information is copied to nodes, there is no need for synchronized networks, data security, accessibility, or integrity.

Security:

Blockchain networks support data encryption, decryption and enforces complex permission for participants and third parties

ZERP on Blockchain

The ERP integration in a blockchain will trace a path for the revolutionary concept that integrates the power of decentralized community and underlying blockchain technology.

The ERP integration on blockchain would allow the transformation of the ERP community into a collaborative platform. EOS's blockchain advantages enable complete ZERP integration.

The ZERP engine will provide API integration with other ERP solutions with which its power and functionality would increase immensely.

Another big advantage is the opportunity for the companies whose ERP's are integrated into the ZERP platform. With the few centralized ERP solutions that exist today, this functionality is possible only if they are users of the same ERP system, and this connectivity means that

dispersed company entities are isolated islands with little qualitative connection. The centralized systems don't allow collaboration with other ERP solutions, which is a major downside compared to ZERP.

The clients depend directly on a centralized system of software development. This represents a sort of conditioning regarding prices, implementation deadlines, and continuous improvement and servicing. ZERP as decentralized platform represents a scaled 'economy' that allows for internal competition and offering and development of custom functionalities in the certain modules, internal competition for ZERP integration into the business processes for the clients as well as internal support teams competition. All these aspects represent a foundation for ZERP's complete business ecosystem as self-standing 'economy' of sorts.

One participant (company, individual) can have multiple roles such as developer, user, implementer, supporter. The prospect of taking more steps towards the establishment of consortia of numerous groups of developers, implementers, advocates - all of which regulated through smart contracts.

Each development community can build their own ERP, in the ZERP platform, using the documented ZERP Engine API - which is ZERP itself.

ZERP helps integrate and re-use the collective knowledge but also the intellectual power of the decentralized community(ies) of users, developers, implementers, supporters.

3.2 Why EOS?

One of the main reasons for the ZERP and EOS integration compared to Ethereum is because the chain processing is much faster with EOS, and their ambition to maximize the speed and number of transactions processed, complements with ZERP's needs.

EOS is designed to be useful for busy entrepreneurs, through holistic model and approach, designed to solve issues once and for all and bring focus, discipline, and accountability (reference: <https://www.eosworldwide.com/why-eos-works>) - all of these principles are working towards our integration, affirming our belief and choice that the integration with EOS will produce synergic and emergent effects.

EOS platform will support the workflow management to be very secure and reliable for the companies. The blockchain will enable traceability in production, WMS, CRM, Supply Chain Management, HR, Project Management, and disable untracked data changes.

Each company would activate different ZERP modules to cover its business processes. Each of the modules means processing encrypted data in chains - ensuring trusted environment to respond to the trust-less expectations. We are also chaining the logs and essential subsequent steps that lead to any given status to enable traceability, integrity, and consistency.

Electronic document exchange between the companies with crypto- and smart-contract protection will support the business process management released of many manual manipulations that drain precious resources. One direct advantage is the reduction of costs that service the functions with ZERP integration transfer to the blockchain.

The smart contracts reduce the need of intermediating authority that would oversee and facilitate the contract settlement. They provide security and safety, along with confirmation of the electronic document exchange. Of course, when one key player such as central authority is

removed from the ecosystem, the duration of the processes and the costs get reduced, as well as the business processes that need to be automated - can be, in the most efficient manner.

The integrity of the chained data allows tracking of the data inserts and updates. The auditing and tracking of inserted and altered data are simplified - and numerous more data chain advantages, such as confidentiality due to the encryption and chaining. Real time auditing solutions by third-party companies can be attached to ensure reliability and transparency.

4. ZERP Ecosystem

4.1 Technical Overview

Building on top of the EOS blockchain

Ethereum is a blockchain platform that allows people to send and receive funds, without the need for a third party, such as a bank. The Ethereum project became the first blockchain protocol to install something called 'smart contract' technology, which allows strangers to agree in a trust-less environment. The technology is based on predefined conditions, and once these are met, the smart contract can release the funds automatically without the help of an intermediary (<https://ethereum.org>).

"Blockchain platforms, such as Ethereum, allow a set of actors to maintain a ledger of transactions without relying on central authority and to deploy scripts, called smart contracts, that are executed whenever certain transactions occur. These features can be used as basic building blocks for executing collaborative business processes between mutually untrusting parties."

(<https://arxiv.org/abs/1808.03517>).

Our platform, ZERP, builds on EOS. EOS is one of many Ethereum alternatives which is a relatively new blockchain project that also can handle smart contracts and also has a promise to speed up transaction time. Just like Ethereum, EOS also has its own cryptocurrency which can be used to send and receive funds, wallet-to-wallet. "EOSIO Software is developed under an open-source MIT license. Anyone can use the EOSIO Software for free. Entrepreneurs interested in building their blockchain derived from our EOSIO Software can fork our repository and customize it for their use. This customization can include configuring token supply, initial distribution, default seed nodes, token symbols, and more (https://www.reddit.com/r/eos/comments/98qf9x/daily_discussion_monday_august_20/).

We are building upon what EOS brings as the foundation:

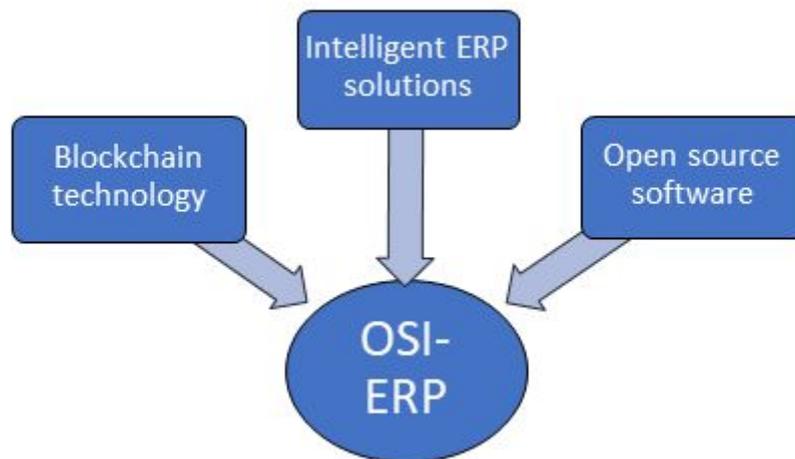
- Blockchain technology
- EOS uses 'smart contracts' technology, allowing strangers to agree in a trust-less environment
- It is designed as a platform for decentralized applications
- EOS are planning to process and scale to millions of EOS transactions per second - which makes it the most scalable blockchain in the industry, being able to handle any real-world application
- NO transaction fees to pay when sending and receiving funds. EOS can achieve instant, free and millions of EOS transactions per second
- EOSIO software is free to use for derivations projects

4.2 The Platform designing principles

We are proposing a new vision for implementation of the next generation ERPs - that incorporates intelligence, richer analytical capabilities from the end-user perspective, and

broader scope of coverage potential across the entire business ecosystem - which help establish or re-enforce the existing and generate new relations among the business stakeholders. The main principles are flexibility, efficiency effectiveness, security, and adaptability.

- This model remaps the ERP potentials based on the synergy of three main components:
 - Intelligent ERP Solutions
 - Blockchain technology
 - Open source software.



4.3 The ZERP core ecosystem and mechanisms

4.3.1 Core components

The ZERP components as illustrated by the figure above;

- Decentralized community of cooperating/competing teams of developers
- Decentralized society of collaborating users (micro, SME companies)
- Decentralized community of implementers
- Dashboard of requests/tasks
- EOS features (smart contracts, blockchain)
- Core ZERP modules (production, supply chain, CRM, HRM, invoicing, warehouses, marketing, retail/wholesale modules)
- Additional modules and features (developed in time according needs)
- Smart contract service processing settlement and clearing engine

4.3.2 Decentralization

The ZERP project has several aspects of decentralization:

The ZERP open source software will be improved (maintained and sustained) through users' requests on a dashboard, where the users also propose some tokens to be paid for the service to the ones who deliver it

- On the other side, there will be teams of developers that monitor the dashboard for work on the software modules, and if capable and interested to do the job, they dedicate to a specific user(s) request. After completing the assignment, through 'smart contracts' they receive the aggregated coins offered from users side for the specific job, because so many users needed it

4.3.3 Use Cases

Use case scenario 1: *New user (company) wants to join the community.*

Step 1 - the user needs to purchase tokens from token owners

Step 2 - the user chooses the necessary modules by staking a certain amount of tokens according to the module value and receives full functionality in return

Step 3: Alternative 1 - Self-implementation according to instruction manuals, and default configurations for autonomous implementation

Step 3a: Alternative 2 - The new user approaches the dashboard and posts a request for execution according to own needs and offers some tokens or asks for an offering

Step 3b: User chooses implementer, and the system binds a smart-contract

Step 3c: After successful implementation (complete or in stages), the smart contract is enforced. If satisfied, the user rates the implementer for the quality, effectiveness, and efficiency of the service positively. If not satisfied, the user evaluates the service negatively. Each of the ratings is influencing the next engagements of the implementer. If the implementer has remarked, they should have been incorporated in the smart contract.

Step 4: ZERP offers two types of support.

Type 1 - A continuous, as core component which can be directly acquired by staking number of tokens. It is standardized and unified and goes along with regular updates and helpdesk.

Type 2 - An on demand, which goes through the dashboard requests, smart contracts, and rating or direct approach to any of the stakeholders that offer support, implementation, and development.

Use case scenario 2: *New developer team wants to join the community* (this goes same for the implementer, and support)

Step 1 - the team needs to purchase tokens from token owners

Step 2 - the team registers as developing team (background, and information) and becomes eligible to take requests from the dashboard. The number of tokens in possession of the team dictates how big and how many tasks the team can assign for, in the proportion of 20 team tokens for one token value of responsibility

Step 3: The team completes the assignment, and the smart-contract is activated after which the users rate satisfaction.

Step 4: The team can apply for other requests bearing its rating and number of tokens to be frozen for up taken tasks. The process continues as needed. In case of negative ratings (will be prescribed by the community) the team may reach a point of being penalized and excluded and may lose part of the token as a penalty.

5. Standing on shoulders of giants – the ZERP backbone

The ZERP software development will benefit from the know-how that our team (in this project also named ZYGOT) has engineered in the past 25 years working on ERP projects (cloud and on-premise) and combined IT/Management/Academic/Entrepreneurial experience of the core founders of over 80 years.

Our existing ERP software is named VERP (derived from Vertex ERP).

5.1 From VERP to ZERP

VERP is an enterprise solution software designed to enable complete enterprise resource planning and management. With its modular organization, it allows timely information flows, accuracy, precision and simple user interfaces towards collaboration.

The visual interface enables easy and fluent acquisition of information, reports, and results. The programme is conceptually designed with modules that represent logical units, allowing the users to choose the appropriate module according to own needs and problems to be solved. VERP is flexible enough to provide fast adaptation to new needs and developments. VERP is scalable according to the company size, which makes it the best choice for small companies, but also, due to its robustness, scalability, and modularity - companies with complicated hierarchical or another kind of organizational structure. It has the following modules:

- Accounting
- Customer Relationship Management
- Warehouse Management
- Production
- Supply Chain Management
- Retail
- Human Resources Management
- Billing Systems
- Fixed Assets Management
- Business Intelligence
- And more
 - Web-shop sales;
 - Auditing reports;
 - Business analysis - per profit centre;
 - Archiving module;
 - SMS-service;
 - PDA devices for retail;

- Mobile app for orders and sales;
- Treasury;
- And extends to any domain, company size and industry, among which:
- Milk buyout;
- Norms in the textile industry;
- The buyout of agro products, and solid waste;
- Cable operators - cable services distributing network
- Veterinarians module;
- Restaurants module;
- Driving schools module;
- Vehicle technical requirements checking services module;
- Housekeeping module;
- Motor vehicles servicing;
- Gas stations - selling of fuels;

Core modules:

● Accounting

One of the foundations in ZERP is the Automated updates of accounting data from all business processes and the Integrative component of each of the other modules (even though each of the other modules is independent and can work separately). This module provides control of financials and accounting in companies, automated and on-demand reports, status reports with collaborators, expenses, revenues, balance sheets, managerial reports, graphical interfaces of the company performance based on no latency updated data, consolidated statements - all according to ISO standards for this domain.

Importance of Blockchain

Security and trust in the data and their alteration.

The current software solutions have a database where any direct intervention can be done - by a developer, admin - sometimes even without management (authority) awareness. Also if the data is encrypted, the developers have access and knowledge of the coding schemes too which still raises some concern.

The Storage of data on a blockchain public ledger guarantees the authenticity of the data due to the immutability of the blockchain ledger. But the need for data modification comes cannot be overlooked - which confirms the security and trust. Often, the ERP users need to have accurate information on the subsequent steps that led to certain data statuses which can also be easily altered in the current solutions, which breaks the data integrity without traceability in the software.

This disturbs the integrity and the data consistency. The blockchain implementation in these processes will mean high degree of security, integrity and trust. By using public blockchain (EOS or alike) these principles are satisfied. If using private blockchain, all of the aforementioned gets to be questionable and there is no use of these claims. In the case of decentralised, dispersed blockchain, such as EOS, we will be able to provide information security, safety, trust, integrity, confidentiality, and consistency.

Importance of Smart Contracts:

The implementation of the smart contracts regarding the Accounting module goes in the direction of providing a process to allow efficient financial management through implementation of the accounts receivable and accounts payable - influencing positive collaborator relations without the need for an intermediary or third party.

Importance of Cryptocurrency:

Automated invoice payments in crypto-currency in the countries where such payments are allowed (which is an increasing number). These payments can be processed repetitively and fast, regardless of the timing of the payment. Such automation can be achieved through automated shopping - upon predefined conditions such as the currency value on the stock markets.

● **CRM**

The Customer Relationship Module incorporates customer data from acquisition, service, and retention, cross-selling, up-selling as well as process flow for excellent customer collaboration. It is filled with data from various sources, but it revolves around the managerial (or customer management) needs for profiling the customer, on one side; his/her relations with the company, on the other. Also, the CRM information in aggregated or timeline manner assists managerial decisions on success, issues, problems but also future actions regarding the customer base.

Importance of Blockchain

The implementation of blockchain in CRM will allow data integrity, trust, consistency, and immutability. The event logging will be secure and unchangeable. This module will extract data from all the others plus its own - here blockchain will allow accurate and unalterable chronology of the events in an integral manner.

Importance of smart contracts

In this part there will be entries possible, also alterations, erasing, corrections (completely controlled by the blockchain technology) and all policies for the collaboration with clients will be created.

Importance of crypto:

It allows automated, simple and easy payment supported by smart contact. Also opens the possibility of creative ideas for engaging with customers (loyalty programs, rewards.) - providing high module performances and increased client trust and collaboration.

● **Warehouse Management**

This module allows for efficient warehouse management. The warehouses can contain inventories, supplementary materials, semi-products, parts, finalized products, and commodities. This software ensures efficient warehouse management, in terms of positioning, placement, search, filtering, FI-FO and LI-FO systems, materials management according LOT number, production date, expiry date, quality, inventory reduction redlines and alarms,

automated orders, surplus or inventory indicators, future needs and prognosis, purchase control by price, quantity and quality.

Importance of blockchain

The trade and distribution with material goods is a natural chain of events for which blockchain is the perfect technology. Traceability in the purchases and selling, LOT creation, control, documentation is also perfect.

Importance of Smart contracts

Production is usually connected to outsourcing, or with separate contracts that can be covered with smart contracts - which would increase contract efficiency.

● Production

This module facilitates the organization and production process management in companies. It embodies production planning and monitoring, analyses, customer orders, production plans, production resources efficiency, alarming due to discrepancies in the production process with standards and plans, total production cost and price calculations, LOT numbers, semi-products management, production process traceability, ISO standards implementation, production technologies, product reservation and orders.

Importance of blockchain

Chaining of events and data in production will allow strong ISO standardization incorporation as well as strong trust in the process - being carried out according to all procedures and principles. This would be in each stage and segment of the production. Analysis, work orders, reservations of supplies, orders, selling analysis accompanied by immutable chronology (logs) in documenting the production.

● Supply Chain Management

https://en.wikipedia.org/wiki/Supply_chain_management

Functions:

“Supply chain management is a cross-functional approach that includes managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end consumer. As organizations strive to focus on core competencies and become more flexible, they reduce their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other firms that can perform the activities better or more cost-effectively. The effect is to increase the number of organizations involved in satisfying customer demand while reducing managerial control of daily logistics operations. Less control and more supply chain partners led to the creation of the concept of supply chain management. The purpose of supply chain management is to improve trust and collaboration among supply chain partners thus improving inventory visibility and the velocity of inventory movement.”

Importance of blockchain:

This is a perfect module for blockchain use.

Importance of crypto:

Smart contracts ensures transparency and seamless transactions, between clients

● **Retail**

<https://en.wikipedia.org/wiki/Retail>

The retail module will integrate many functionalities: product and service sale, easy and functional combination of various strategies for auction sales, customer loyalty programmes, future sales forecasts, order automatisisation, action proposals, customer analysis and categorisation, e-mail and SMS notifications to clients based on the shopping habits, discount reminders, profitability reports, best-selling products, most profitable products, largest quantities sold, supplier analysis per product, per timeframe, ...

Why blockchain:

Immutability, not having the possibility to intervene in the data officially or unofficially; unmistakable chronology of the purchases.

Why smart contracts:

Possibility to implement customer loyalty and customized policies for each client - a novelty in these modules. Smart contract implementation is regarding the chronology of events, especially interesting for retail companies. It would be personalized customer approach - impossible to have without the blockchain.

● **HRM**

https://en.wikipedia.org/wiki/Human_resource_management

This module is used for employee information aggregation, from recruitment through employment and post-employment. It incorporates qualifications, advancements, salaries, awards, penalties, benefits, job migration. But also former positions, references. The workflows are automatised, and there is an opportunity to process the requests faster and according to the prescribed process.

Importance of blockchain:

Integrity, consistency, trust, prevention of unauthorised data modifications.

Importance of smart contracts:

Defining the conditions and terms with the employees during the entire employment, payments settlement, automated smart contract activation. Also, possibility to disburse remuneration in cryptocurrency.

● **Billing Systems**

This module is used in companies serving regular clients and have various modalities of payments - fixed, counted, For example, cable operators, utilities and others. This module is very useful when the company sends invoices (in periods or monthly) for services to the clients. There is an opportunity for various packaged offers, contracts, email, e-payments. This module allows increased productivity, efficiency and effectiveness.

Importance of blockchain:

Excellent technology for implementation of this principle of payments. Also logging and invoicing, as well as payments and settlements - in strong relation with CRM and Accounting module.

Importance of crypto:

Payments can be automated in cryptocurrencies

● **Fixed assets management**

This software module allows efficient fixed asset management:

purchase, maintenance, selling, productivity analysis, maintenance expenses, interest, recommendation for replacement, Prediction of inventories to replace broken parts and provide optimal support and continuous business processes, Execution of inventories with mobile devices, NFC, barcode readers, RFID, Vehicle maintenance and all fixed assets used in companies, Comparison of the productivity, efficiency and rentability of the different fixed assets categories.

Importance of blockchain:

Events chronology, immutability, integrity, data consistency, and trust.

Importance of smart contracts:

Automatically executes contracts with partners for fixed assets maintenance. There is also a Possibility to have employee contracts for these purposes.

● **Business Intelligence**

https://en.wikipedia.org/wiki/Business_intelligence

This module allows analysis of data: historical, current and forecasts. This module serves managerial needs on all levels - strategic, tactical and operational. The data gathered for the model derived from the entire ecosystem - and horizontal, vertical and cross-sectoral analyses are possible.

Importance of blockchain:

Analysis of the core data for the business existence, as well as cross-sectioned data for components, departments, including historical and current data and providing forecasts.

Importance of smart contracts:

Connected with the other modules - smart contracts

5.2 Our gems invested in ZERP

To wrap it up - these are our gems, invested in ZERP:

- Existing VERP with 20+ core modules and customizable plugins
- Used by 200+ companies in the Western Balkans region
- Extended supply network collaborators of 6000+
- 25 years of Vertex company experience
- A team of 12 everything-is-possible developers and engineers
- The founding team of passionate and creative hard-workers and wise managers
- An incredible collection of international one-of-a-kind advisors

We are setting the scene and opening horizons so that developers, users, consultants, implementers, investors and innovators cooperate and compete, co-creating ERP value for all.

6.0 Business Model

6.1 SWOT Analysis

<p>Key Partners Who are our Key Partners? Who are our Key Suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform? Vertex, EOS - blockchain, Teams of developers, Around 200+ VERP business partners, Marketing specialists</p> <p>Activities: Scanning and defining business processes, software testing, Cross-platform providers, marketing activities,</p>	<p>Key Activities What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue streams? VERP existing base of users, partners, modules, ... as foundation for ZERP kick-off Referrals from existing customers with incentives, Regional business developers, Alpha-version feedback from global community,</p> <p>Key Resources What Key Resources do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams? 25+ years knowhow on software and ERP development Financial - Individual investors, Semi-financial - ZERP stakeholders, Consulting capabilities and experience</p>	<p>Value Proposition What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment? Which customer needs are we satisfying? Unique Selling Point - accessible, affordable, inclusive ERP modular solution for micro&SMEs that is continuously improved by cooperative community of stakeholders Problems solved: access to functional ERP in timely, cost-effective and need-specific manner; modular, cross-platform solution, community improvement of relevant modules; inherent mechanism for fair competition and cooperation amongst teams of developers; usage of modules tailored for user needs</p>	<p>Customer Relationships What type of relationship does each of our Customer Segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they? Existing VERP users - strongly established New ZERP users - micro companies, small and medium enterprises (globally)</p> <p>Channels Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines? Existing customer base referrals, Promotions, Geographic responsibilities for business development, ...</p>	<p>Customer Segments For whom are we creating value? Who are our most important customers? Micro companies, family businesses, SMEs - as primary focus, Enterprises in general. Most important stakeholders are large number of companies that don't have cost-effective access to ERPs</p>
<p>Cost Structure What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive? Developers, Organizing team, Management, Marketing, Equipment, Facilities, Licences, ...</p>		<p>Revenue Streams For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Stream contribute to overall revenues? Crowdfunding, Access to 'live' ERP that micro&SMEs usually cannot afford, New customers ... because the main idea is for ZERP to be self-sustained as collaborative ERP blockchain ecosystem.</p>		

6.2 PESTLE Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> → <i>What advantages does your organization have?</i> → <i>What do you do better than anyone else</i> → <i>What unique or lowest-cost resources can you draw upon that others can't, how do you get the sale?</i> → <i>What do people in your market see as your strengths?</i> → <i>What is your organization's Unique Selling Proposition (USP)?</i> 	<ul style="list-style-type: none"> → <i>What could you improve?</i> → <i>What should you avoid?</i> → <i>What are people in your market likely to see as weaknesses?</i> → <i>What factors lose you sales?</i>
<ul style="list-style-type: none"> → Experience in providing modular ERP solutions in different domains/industries → Large base of existing customers and distribution network → Business-academy relations → Scientific and practitioner approach to design and implementation → Established project management flow → Established product maintenance and upgrade flow → Established in designing generic modules and shortest route to customisation → Broad international network of the founders, advisors, team → Existing ERP on market that is a foundation for Technology Readiness Level 6 of the novel ERP → Experienced initial developers team → Diverse competences in the partner and advisor team with global outreach → Addressing business-as-usual-motivation - profit, and qualitative improvement - inclusive ecosystem for any entrepreneur → Standing on shoulders of giants - by basing the solution on EOS blockchain → USP - accessible, affordable, inclusive ERP modular solution for <u>micro&SMEs</u> that is continuously improved by cooperative community of stakeholders → Modelling prospects for (i) components of the business model and (ii) business process flow towards easy (re)configuration and (re)engineering from the users/implementers. → Simplifying the coin purchase/selling from/to individual investors by introducing coin engine that handles the transactions and certification internally within <u>Zygot</u> 	<ul style="list-style-type: none"> → Early acceptance of blockchain technology - which needs more time to mature and lessons to be learned → Scaling-up may be an issue of international growth because of lack of dedicated persons to be properly induced to the project and take-over expansion → Seed funding stage may take too long, while the competition may advance → Developing and introducing not very appropriate marketing strategy and inability to adapt it
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> → <i>What good opportunities can you spot?</i> → <i>What interesting trends are you aware of?</i> → <i>Useful opportunities can come from such things as: Changes in technology and markets on both a broad and narrow scale; Changes in government policy related to your field; Changes in social patterns, population profiles, lifestyle changes, and so on</i> 	<ul style="list-style-type: none"> → <i>What obstacles do you face?</i> → <i>What are your competitors doing?</i> → <i>Is changing technology threatening your position?</i> → <i>Do you have bad debt or cash-flow problems</i> → <i>Could any of your weaknesses seriously threaten your business?</i>
<ul style="list-style-type: none"> → Early penetrator opens opportunity to acquire the market <ul style="list-style-type: none"> ◆ In the sense of micro & SMEs ◆ In the sense of blockchain ERP on EOS → Getting partnership with one of the big players because of providing functional Proof of Concept (PoC) → Facilitating increased fairness on the market for all parties (providers, customers, intermediaries) - principle supported by institutions and unions (such as EU, WTO, USA, ...) and their acts → No current indebtedness - opening space for additional funding (especially if death valley occurs after seed) → Document exchange among parties 	<ul style="list-style-type: none"> → Crypto-market volatility → Bad reputation schemes and fraudulent projects dettracting investors → Regulations and legislative in different countries may become <u>harsh(er)</u> or change → Low total circulation and supply of crypto-based currencies compared to the fiat currencies on global level

7. Tokenomics

7.1 Token Utility

The zygote token is the core resource that powers the ZERP engine. Its usage will be present in multiple mechanisms throughout the ZERP ecosystem.

THE MODALITY OF USAGE:

1. Token stake:

- The users will have to stake a certain amount of tokens based on the modules they want to unlock.
- The tokens will be locked in a smart contract for certain amount of time (e.g. 1 year).
- If the user decides to unlock the tokens and disable a module, he/she will be 'penalized' with certain amount of tokens based on the timeframe of usage. If necessary, the amount of tokens locked for the modules can be voted by the community and recalibrated accordingly.

2. The tokens will fuel the smart contracts that are used as a mechanism for interoperability between different instances of the engine. Examples of these are documented exchange between companies, automated contracts between companies (e.g., supplier and consumer), cross-integration between companies and access management (permissions to federated users and policies) to their databases (extranet).

3. General governance of the system:

The users can vote on a variety of properties of the system (module pricing/staking, dispute mechanism, protocol changes, etc..). The tokens will also be used in the ZERP marketplace. Development teams will have to stake a certain amount of tokens in order to be eligible to accept tasks from a certain company (which also uses tokens in order to be able to request/pay a change/addition for their instance).

7.2 Token distribution

From the very beginning, Zygot's vision was to respect certain governing principles. At first, the idea was that those principles are respected internally in the company, and then iteratively expand to the broader community. One of them is transparency. That is why we decided to follow Aragon's transparency model. As per our Transparency Model, we do quarterly Transparency Reports of our use of funds and about the overall progress of the project.

Applying the above principle, below is the token distribution information:

Total Tokens: 100.000.000 Zygot tokens

67% in the private token sale

9% sold to seed investors

6% to the team (locked up for 12 months)

12% cold storage liquidity reserve

6% legal / token sale expenses

7.3 Zygot market Sync

Due to the current nature of the crypto ecosystem, it is cumbersome for new users to acquire tokens. They are required to go to unfamiliar 3rd party exchanges, verify, set up pins and additional security layers. This creates friction and makes our product onboarding more complicated, while our basic principle is a fluent optimized route. That is why from the very beginning we will implement a mechanism that would provide a way to acquire tokens directly from our website. This would be done in a transparent way, where our backend will buy tokens on the available exchanges on behalf of the user, according to current market prices, with no margin or any alteration whatsoever for acting as a kind of intermediary in the process. Since this would be a completely decentralized/open source solution, we (Zygot LTD) do not require a money transmitting license. Besides the ease of access, this would provide more liquidity of the token on the exchanges. Reports including links and audits will be provided so that everyone can monitor this process. This will by no means affect the price decided by the open market.

8. Team

The team can be explored here: <https://zygot.io/about>

9. Roadmap

We have added an interactive roadmap on our site: <http://zygot.io/roadmap>.

This roadmap will be updated very frequently, and will also connect to dev updates / release notes.

Besides that, we also have an interactive FAQ page: <http://zygot.io/faq>