

# Rimulation

*Imagine Big*

White paper

# **BLOCKCHAIN BASED SUPPLY CHAIN MANAGEMENT**

**Technical Overview, Nov. 14, 2017 by ...**

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# Introduction

The World's first cryptocurrency – Bitcoin- appeared in 2008 and presently a huge trade of approximately \$ 7 billion happens in cryptocurrencies. Appearing in 2015, Ethereum brought the concept of 'smart contracts' to cryptocurrencies. A smart contract is a computer protocol intended to facilitate, verify, or enforce the negotiation or performance of a contract. The aim with smart contracts is to provide security that is superior to traditional contract law and to reduce other transaction costs associated with contracting.

The Rimulation technology described herein, and cryptocurrency termed as Rimules based thereupon aims to simulate real world supply chain management virtually while exploiting the power and characteristics of secure distributed ledger and smart contracts enabled by Ethereum. A rimule is a standard ERC20 token distributed in the Ethereum blockchain network. In this manner, the Rimulation technology and cryptocurrency rimule based thereupon is solidly grounded in real world economic system. It aims to provide a solution to an aspect of the real world economic system, the solution representing a huge profit potential. The ICO proposed will build an ecosystem that will provide stable benefits and success to rimule owners through facilitating such a solution, as elaborated further.

# Project Highlights

- Rimulation creates value for imagination and enables humanity to realize it by connecting voids around the globe and enabling people to collaborate and fill such voids, wherein voids represent shortage of supply that can be filled by another void of shortage of demand (leading to excess supply) at another place.
- An implementation of Rimulation technology will be by means of rimulators and a virtualgodown will be the world's first rimulator. Virtualgodown as conceptualized and implemented using the proposed Rimulation technology not only connects abilities and values globally but also enables any user to exchange resources digitally around the globe through exchange of crypto-assets. A virtualgodown provides an exchange medium in terms of crypto-assets that is referred to as Rimule.
- Founders of the proposed virtualgodown and Rimulation technology foresee blockchain, Robotics, Artificial Intelligence (AI), Mixed Reality, and Virtual Reality (VR) combined with quantum computing improving upon current human abilities. Rimulation is conceptualized to make full use of these evolving technologies to build a space for humans in a computer-filled universe.

# Achieved so far

- A singular computer system self-capable of mapping sources and destination in an automated supply chain ecosystem that includes computable blueprints, rimmaterial, rimproducts, piping mechanism called v-tubes process along with source and destination mapping. The system reduces the number of intermediates in the chain and improves efficiency by pre-planning the products to be manufactured. Such system enables creation of virtual blueprints and virtual pipeline (v-tubes) of rimorders to be executed. Rimmaterial can be created unequivocally and can be replicated in other blueprints which can be re-modified till it reaches immutable state for manufacturing, logistics and storing. Methods and systems for automation and/or an artificial intelligence and/or software for emulating a virtual world in future time are provided, that can integrate and achieve blueprints, thereby creating goods at reasonable cost by streamlining and improving the process involved in their manufacturing.
- Rimulation technology enables real-time creation of a stockarea and efficiently associating the stockarea with other stockareas. Automation and/or an artificial intelligence is used to create a stockarea in real-time and associate the stockarea with one or more material products associated with one or more other stockareas to place an order or a demand of the material products. A unique identification (UID) is allocated to the stockarea created, and the user automatically updated on parameters selected from any or combination of availability of the other stockareas, non-availability of the other stockareas, availability/non-availability of the one or more material products in the other stockareas, and location of the other stockareas.
- Rimulation technology retrieves information associated with the materials and/or the products at a location from the sources. Utilizing the information based on a query received from a user and one or more characteristics of the information, a logical inventory is formed that is a logical space for the sources to define the capacity associated with the materials and/or the products. Location of the logical inventory is

pinpointed on a computer-implemented map of a geographic area that is of interest to a user and based on the query received from the user expressing an interest in purchasing the materials and/or the products from the logical inventory, a graphical icon is positioned on the computer-implemented map indicative of the location associated with the logical inventory in the geographic area.

- Rimulation technology enables a cost estimation system that includes a receiving module, a current cost estimation module, a pricing module, a set of pricing models, and a future cost estimation module. The receiving module can receive information on raw materials required for production or manufacturing of the product in terms of their current price/value. The current cost estimation module can estimate a current cost of the product based on the information of the raw materials. The future cost estimation module can estimate the forecasted pricing information of the product by utilizing the pricing module and pricing models. The cost of products which are dependent on material whose cost is likely to be varied are also estimated based on the cost estimation of the material.

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# Rimulation—Supply Chain Management (SCM) from Virtual to Real powered by Blockchain

## The Problem

Matching of Demand to Supply – be it of products or services- is the biggest challenge of any enterprise and indeed nations. A solution to mitigate at least partly the problem of a supply-demand mismatch, is that of “inventory” or “storage”. There are five basic reasons for inventory mismatch/inconsistency:

1. Time: Time lags present in supply chain from supplier to user at every stage require that every link maintains certain amounts of inventory to use in this lead time.
2. Seasonal Demand: While seasonal demand (for example, warm clothing) varies periodically, producers' capacity is fixed, which can lead to stock accumulation.
3. Uncertainty: Inventories are maintained as buffers to meet uncertainties in demand, supply and movements of goods.
4. Economies of Scale: While ideal solution is obviously each unit exactly being available when and where needed, this is generally not economically viable considering production, storage and transit costs, resulting in bulk buying, movement, and storing to bring in economies of scale, thus inventory.
5. Value appreciation: Some stocks need to be aged-wines, for example. Hence, some stock gains the required value when it is kept for some time to allow it to reach the desired standard for consumption or for production.

However, inventory also represents resources/values that are unutilized or underutilized, for instance:

- Raw materials - materials and components scheduled for use in making a product.
- Work in progress (WIP) - materials and components that have begun their transformation to finished goods.
- Finished goods - goods ready for sale to customers.
- Goods for resale - returned goods that are saleable.
- Stocks in transit.
- Consignment stocks.
- Maintenance supply etc.

Even an order in supply chain that is not fulfilled immediately represents an unutilized asset. For example, a buyer may have given an advance to book his /her order and is now waiting. At the same time, the seller/manufacturer cannot immediately fill the order and so, is sitting on cash outflows (and associated risks) while it arranges raw material and plant/labor to fill the order. All above adds on to a liquidity crunch since inventory cannot be readily converted into cash. Besides, no transparent escrow mechanism that leverages current inventory holdings, whatever might be the state of the material, exists.

It is estimated that at current price, world's inventory would be roughly 25 to 30 trillion US dollars. To put this in perspective, the US federal budget is about US \$ 4 Trillion only. Such inventory represents locked up value. To release this value, further investment –such as in manufacturing, distribution and logistics is required.

Hence, present supply chain networks and associated Supply Chain Management (SCM) techniques are highly inefficient/have high resistance/friction. To elaborate:

- 1) Product movement in existing SCM networks cannot be leveraged, which causes liquidity crunch, leading to resistance.

- 2) Current SCM networks are not transparent, that is, at any time, status of a product is not known. Only endpoints of a link (receipt of raw materials and dispatch of finished products, for example) can be known with some certainty and that too on/after the event. This lack of transparency, inherent to present SCM networks, prevents various participants from taking informed, timely decisions, thereby increasing resistance.
- 3) Orders presently in the network but in different stages of production / dispatch have essentially null value. For instance, a customer of a motor is not prepared to pay till the motor is delivered to it. In case the network is transparent with full information flows, the customer can easily be persuaded to pay at least some amounts. Hence, a supply network as it exists now does not allow for leveraging of orders/ semi-finished products.

While some existing supply chain systems using power of information technology and Internet (for example, e-commerce websites, JIT techniques and the like) alleviate above problems to some extent, a huge gap still exists.

## The Rimulation Solution

Rimulation aims to simulate supply chain management as it happens in the real world, while making the full chain completely transparent, responsive and frictionless thereby obviating problems as above leading ultimately to a reduction in inventories and associated costs.

Even a 10 % reduction in worldwide inventories can translate into an asset unlocking of about 4 trillion dollars!

Rimulation uses digital concepts such as cryptocurrency/blockchains, artificial intelligence and virtual reality optimally. As these technologies evolve and mature, Rimulation can make full use of them, using novel techniques and methods such as rimmaterial creation, v-tube, stockarea, S-D algorithm and rimescrow elaborated further.

Rimulation brings a worldview where the complete supply chain - right from ordering to delivery - leverages information to the maximum and in as transparent a fashion as required by various stakeholders. Transfer of value at any step of the chain will be handled in an equally frictionless manner by means of an exchange medium called Rimules (that translates to currency in the real world, but with strong advantages that a cryptocurrency based on blockchain brings). Value can be determined and unlocked at every intermediate step between order and delivery, thereby bringing strong liquidity to production and distribution processes. Such liquidity obviously enables each link of the supply chain to in turn optimize its processes, hereby leading to an ever-increasing cascading positive effect.

In a rimulation worldview, an order can be placed digitally from anywhere at anytime, for delivery in any space-time coordinate (including future time), and used to make other orders or liquidate existing inventories wherever they might be. As production of goods is simulated, each intermediate product can as well be simulated and its value determined at a common Rimule platform, thereby realizing value in the supply chain even before the final product is produced/ delivered. Space/time as in real world (for example, place and time of delivery) can be simulated digitally. Any relevant information at anytime can be communicated at speeds of light to all stakeholders in a transparent fashion. Rimulation opens up possibilities of people/ communities collaborating on a global scale to design and produce various products (and services too) in as optimal, transparent and frictionless manner as possible.

Complete stockarea information-required as well as available – at any space-time coordinate is readily made available, enabling logistics to be planned to a precision hitherto not possible. Logistics requirements are provided in terms of square area requirement that can be expressed in linear coordinates rather than on loads. For instance, one could predict that in 2019, at a coordinate of  $(x, y)$ , area from  $(x, y)$  to  $(a, b)$  will be required to store inventory that'd be available at the time. The time period such storage may be required, as well as onward trajectory of further processed material (wherein stockarea may increase/decrease

as well) as well as space-time coordinate of next node ( as well as all nodes till consumption) can as well be planned.

Rimulation grows in intelligence as it is used and corresponding databases, information bytes etc. stored, updated and retrieved. As a result, it makes full use of adaptive intelligence/ artificial intelligence principles to make itself more and more useful as time passes. Collaborating on global scale enables super mass production, and of products not even imagined presently using best of capabilities and resources available. Nash equilibrium ([https://en.wikipedia.org/wiki/Nash\\_equilibrium](https://en.wikipedia.org/wiki/Nash_equilibrium)) considering decisions of various participants in the process can be achieved.

The power of Internet is evident in connecting people and communities both for personal as well as professional reasons. E-commerce is well established as a means of leveraging people /communities to achieve economies of scale. Integration and automation of production lines using AI and robots with minimal human intervention is well on the way. Rimulation builds on these existing technologies to bring in a paradigm shift in how goods are produced and inventories managed optimally. Orders can be created and traded globally in different supply chains thereby creating value even before they are produced. Not only can orders be traded, they can as well be pledged for liquidation with various financial institutions. A supply trajectory can be developed right from blueprint stage. The trajectory can be transparent to all stakeholders and corrected/ modified as and when required. All sources and destinations can be integrated globally. And all of this can be achieved in almost a zero friction environment wherein at each step / modification the most optimal of choices is automatically acted upon, or presented to a human for his/her further actions. We can “Rimulate in a computer and produce in the world”.

# Rimulation Overview

## An Example

Rimulation helps optimize a singular system, that, in one implementation, can be conceived as a supply chain management system. For instance, if in 2020 copper demand in the USA is 60,000 tonnes, Rimulation can provide a platform where anyone can order(simulate) copper for 60,000 tonnes using rimules, wherein people can invest only 10% (say) cost initially to produce copper and when time comes they can sell it to people who want this quantity of copper in real world. Vendors globally can collaborate to fill such orders. Even though order would be realized in 2020, the person holding the order would become owner right now. As days progresses the order should get more sustainable as it would add/require more rimules to it. Orders can be leveraged and pledged.

Six important interfaces in rimulation are:

1. Rimmaterial creation mechanism and repository itself.
2. V-tube, ledger to record transaction and accessing S-D algorithm .
3. S-D algoritm and AI module to map maker and taker.
4. RimEscrow , mechanism to compute leverage for orders in v-tube
5. RimWallet a wallet to hold rimules and leverage values.
6. RimExchnage a module to buy/sell rimules with other crypto or fiat currencies.

These interfaces have to implemented by rimulators. So an order created by any of the rimulators will be visible in v-tube. Similarly any of the rimulator creating rimmaterial and being accepted by network will be accessible by all rimulators.



100 rimules (1 tonne copper @ 10% cost for 2020)collaborator

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Buy for 90 rimules (1 tonne copper @ 100% cost for 2020) end user in real world



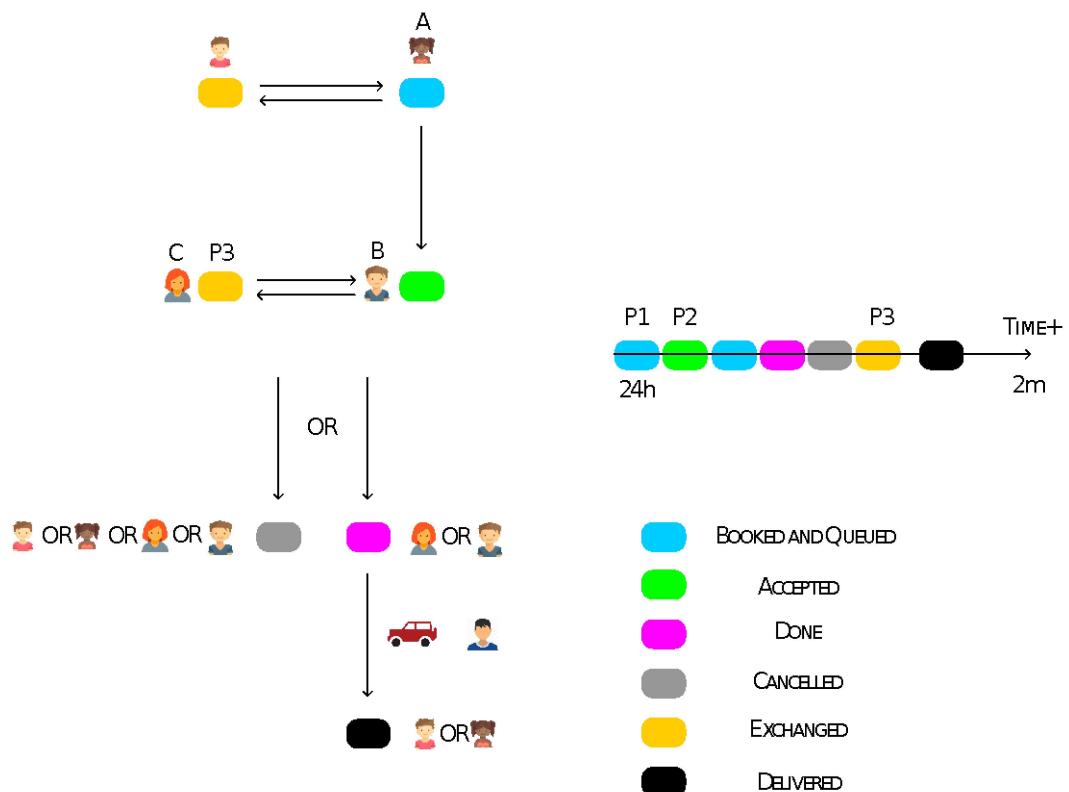
Note: We anticipate a deflating currency.

Rimulation creates an ecosystem for producers, creators, movers and buyers in a sustainable production model. For instance, a booker books a Rimproduct (that is a product being offered/procured using the ecosystem proposed). It is accepted by a source (maker/supplier) and, if not cancelled by the maker or the booker within pre-set time, is made in real world and delivered to the booker who now owns the Rimproduct. Rimules are used to purchase the Rimproducts and, just like physical currency, can be used to make further transactions. In any transaction, there are at least two parties- a maker and a taker. The taker finally owns the Rimproduct made by the maker. Rimules are used to purchase Rimproducts. Rimule is a deflationary token because of its influence on future have many users/stakeholders in interest (like Bitcoin or Litecoin). Rimules will help to shape our future in ways that we would never imagine.

Dear Sir, a gentle followup on the below appended email.

Tarun

## Rimproduct Process Status



The Rimulation technology brings together smart contracts and blockchain technology with a payment /settlement procedure based on rimules to provide for trustworthy contracts with transparent process flow monitoring. A secure blockchain based ledger updates itself in real time as rimules are transferred from one entity to another. The ledger can clearly indicate the supply chain queue and developments therein in a transparent fashion to all its stakeholders.

As illustrated above, a buyer A places an order that is booked and queued in a Rimulation technology based system and a supply chain queue is initiated, as indicated at P1. Smart contracts enabled by the Rimulation technology ensure that the order is trusted. The trust can be established, for instance, by an escrow amount that buyer A can deposit into the system, using rimules.

The order/requisition can be sent to different potential vendors for their information and bidding. The technology can automatically select set of such potential vendors based upon past historical data, for example, as well as factors unique to the present requisition of buyer A (that can be, for instance, an urgent order to be executed within 24 hours). Various options can be configured within system itself. For instance, the technology can evaluate bids made by interested vendors and automatically select one, or can send various bids (or a subset of them for instance, lowest 3 bids) to buyer A for its final selection. Upon acceptance of order by a selected vendor, for instance Vendor B, the supply chain can be updated in realtime, as illustrated at P2. Smart contracts enabled by the Rimulation technology ensure that the acceptance is trusted. The trust can be established, for instance, by an escrow amount that vendor B can deposit into the system, using rimules.

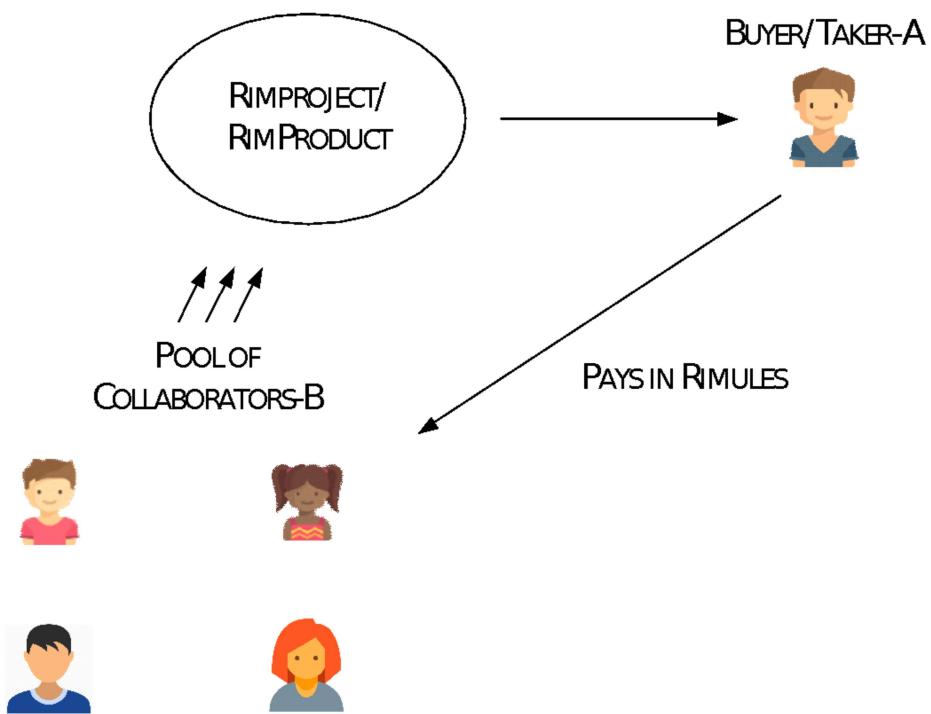
The Rimulation technology can enable the process to be repeated as much as required. For instance, Vendor B can in turn require a sub-component of A's order be procured from others and the sub-component order can be accepted by a Vendor X. Upon such an acceptance, the supply chain queue can be updated accordingly. Vendor B can even exchange full/part of an order with another entity, say Vendor C as illustrated. For instance, the order may require machining of some items and at the moment vendor C may have spare machining capacity available that it can exchange, for instance, with excess casting capacity that may be available with vendor B. Such exchange can occur at any time during execution of the order placed by buyer A, and can be represented in the supply chain queue as P3.

In a similar manner, any aspect of execution of order placed by buyer A, including cancellation of order(s), completion of an order (that can be a sub-order as well), delivery of

an order/ sub-order etc. can be easily tracked and represented in the supply chain queue. Each step of execution of order placed by buyer A can be represented by blocks as illustrated, and can be enabled by blockchain technology to be highly secure and trustworthy. Buyer A, and likewise any other stakeholders can access the queue (or relevant portions of the queue) to determine progress of their relevant orders.

As can be readily understood, the supply chain queue thus formed can be updated in real time as various transactions happen, and can be totally secure and trustworthy. It is not necessary for various stakeholders to physically transact with each other and indeed the Rimulation technology can very easily facilitate global transactions. Smart contracts enabled by the technology ensure high level of security and trust. Likewise, all transactions in rimules can automatically create the supply chain queue as elaborated above. All data can be stored and used for historical analysis, further purchases etc. thus creating a global supply chain fully capable of exploiting various ‘voids’ wherever they may exist. Overtime, problems of stockouts and excess inventory can be eliminated leading ultimately to a fully efficient global supply chain (leading right from ore mining, for example) to a completely assembled product delivery to a customer.

## Collaborative Supply Chain Management



The Rimulation technology enables very strong and secure collaboration between a buyer/taker and various vendors, as described herein. The collaboration can be as transparent as the buyer prefers and granular control can be exercised upon what is revealed and when. For instance, the buyer can configure the supply chain queue to inform various collaborators manufacturing status of sub-components of a product they are manufacturing so that each collaborator can schedule its production planning accordingly.

As illustrated in figure above, a taker/buyer A can collaborate not only with one but a pool of collaborators as shown at B. Not only products but projects can as well be handled efficiently by proposed technology. As can be understood, a project requires collaboration amongst several vendors that can be indicated as a pool of collaborators above. The various collaborators have to perform different functions. For instance, for building a bridge, firstly site investigations will have to be carried out, next designs/ blueprints will have to be made and approved. Thereafter, preliminary site work such setting up of temporary site facilities,

dewatering etc. will be required. At the same time, digging of foundations, casting pillars etc. will commence. Casting pillars will require procurement of various materials such as concrete, pre-stressed steel bars etc. As work progresses, horizontal beams, expansion joints, roadside barriers etc.etc. will need to be laid that will require procurement for different materials. While some activities can proceed together, some others will require other activities to be completed before. While some may be done by the main contractor, some other may be done by sub-contracts and sub-sub contractors. As the project progresses some activities may be delayed for various reasons. Other dependent activities will have to be adjusted accordingly.

As can be understood, the project requires monitoring and control over various activities, including procurement. Rimulation technology can enable the project to be optimally handled right from blueprint stage. A Project Manager can provide details of the materials needed, quantity and time, on an interface that may be provided on his mobile device in form of a blueprint that include the materials needed, quantity and time in a specified template or format and can be uploaded to a server/cloud. The technology can choose a set of orders, decide the best manufacturers/sources for them and send them the requests. Sources that give the best offers can automatically be selected. The ordering procedure can similarly proceed towards backward integration, right upto the basic ores (for example iron and the like) required. Excess inventories or their lack (voids) can be factored in while evaluating suppliers. Historical data can be used as well as stored for further analyses and usage. Blockchain based payment system can enable orders to be securely released to various vendors while further payments can be based upon delivery schedules that can be accessed/ provided anytime to relevant manufacturers / sub-contractors/ service providers.

Further, as already elaborated, Rimulation technology can develop a supply chain queue that can transparently provide to anyone so authorized, details of each transaction such as orders queued, accepted, done ( finished), cancelled, exchanged, delivered etc. Rimulation technology can create smart contracts supported by blockchain based rimules to enable a

singular system, for instance a supply chain management system that can create, maintain and update in realtime a highly secure and transparent supply chain queue.

## Some Terms and Concepts

**Rimulation:** Technology or method to create rimmaterial/ rimproducts and voids in the system to enable pricing or trading of various products and help in planning and programming with an intent to make products available in real world. Rimulation is a dynamic blueprint sketching that influences other processes within rimulation with intent to channelize production or redistribution of products to make an impact in the real world. Output of Rimulation will be a set of rimorders generated and queued up in V-tube (Similar to blockchain).

**Rimulator:** Simulator for real world goods manufacturing and redistribution that encompasses Rimproduct creation, blueprint mechanism ,and v-tube mechanism .Virtualgodown will be world's first Rimulator and will implement Rimulation's Rimmaterial creation engine and v-tube engine. Any Rimulator wishing to implement Rimulation will be required to implement all interfaces in mentioned earlier viz. rimmaterial creation mechanism and repository itself, V-tube , ledger to record transaction and accessing S-D algorithm, S-D algorithm and AI module to map maker and taker.

**RimEscrow:** Mechanism to compute leverage for orders in v-tube, RimWallet -a wallet to hold rimules and leverage values

**RimExchange:** A module to buy/sell rimules with other crypto or fiat currencies.

**Rimorder:** An order generated out of Rimulation. Dear Sir, a gentle followup on the below appended email.

Tarun

These orders can be booked or transferred using rimules, and can be queued up in V-tube. A rimorder requires two important factors – location and time. This representation of location

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and time is called a stockarea (elaborated further). Any order in Rimulation has to come from a stockarea. Stockarea has to be implemented by rimulators to make their clients create any order.

**Source-Destination (S-D) algorithm:** An AI module used to map best possible maker for a Rimorder with respect to space-time (that is, location of delivery and time of delivery of a Rimorder). This algorithm also supports allocation and re-allocation of orders based on real-time impact. S-D algorithm will have access to capacity database . S-D algorithm will be able to perform aggregation and segregation of orders. S-D will try mapping maker for a taker and vice-versa( similar to ask/bid mapping in a trade platform). S-D will evolve naturally to a stage where orders will be created automatically based on knowledge gained.

**V-tube:** Superconductor for material flow, a digital pool or ledger to record all transactions in the rimulation. Any sell/ buy order will be recorded in v-tube. V-tube will have access to source destination algorithm, rimescrow mechanism and capacity database.

**Cascading cost effect:** Cascading cost effect of different Rimproducts can be seen in Rimproduct exchange because one Rimproduct affects the other, and also many participants in the system affect others, for example, cost of production varies as per suppliers selected.

**Bought in the advance:** Rimulation can incorporate advance orders, which improves production cost, time, and quality because it can be well programmed.

**Pool of collaborators:** People who join hands and create projects or Rimproducts, and then sell to the market when taker pays them for it.

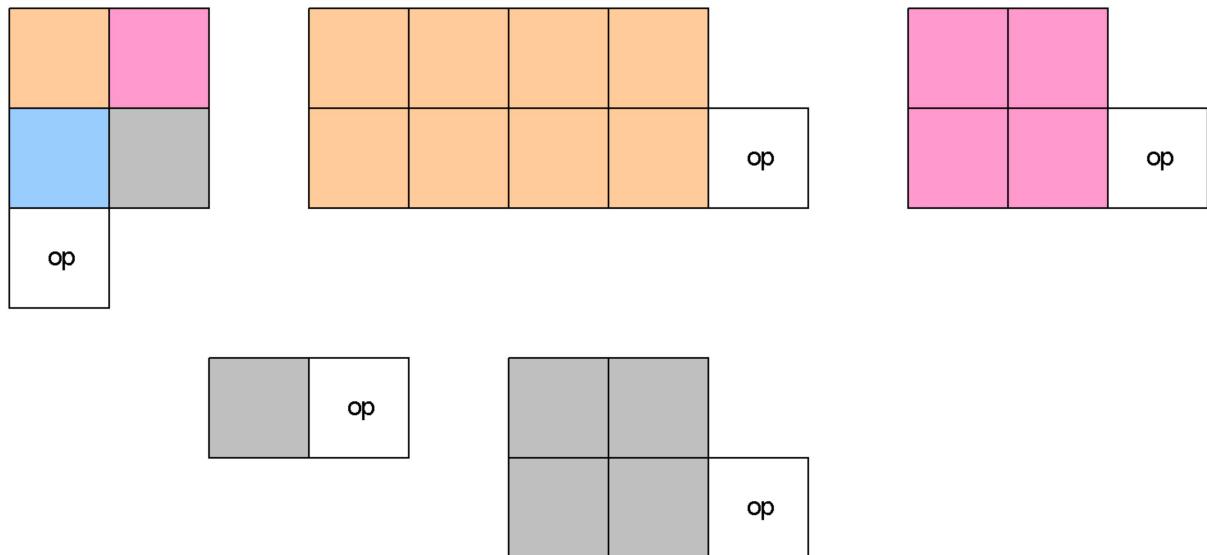
**Stockarea:** Unique representation of a particular product. Any or a combination of product availability, holding capacity, production ability, demand or production process are some of the salient aspects to consider when creating a stockarea in a specific space-time. Stockarea forms the base for Rimulation and S-D algorithm. Stockarea can become unit of

intelligence that will be owned by resource owner. This intelligence can be replicated across space-time, can become proprietary right of the creator within the system, and can be exchanged for royalty.

**Rimproduct Creation:** A merkel tree implementation for creation of different products/materials ([https://en.wikipedia.org/wiki/Merkle\\_tree](https://en.wikipedia.org/wiki/Merkle_tree)). Virtualgodown scans naturally available ores as Rimmaterial, wherein the system evolves with layered limited intelligent system with open option(op), using adaptive machine learning.

Rimescrow : An AI algorithm to implement escrow. Rimescrow will have a leverage computation mechanism.

# Layered Limited Intelligent System with Open Option

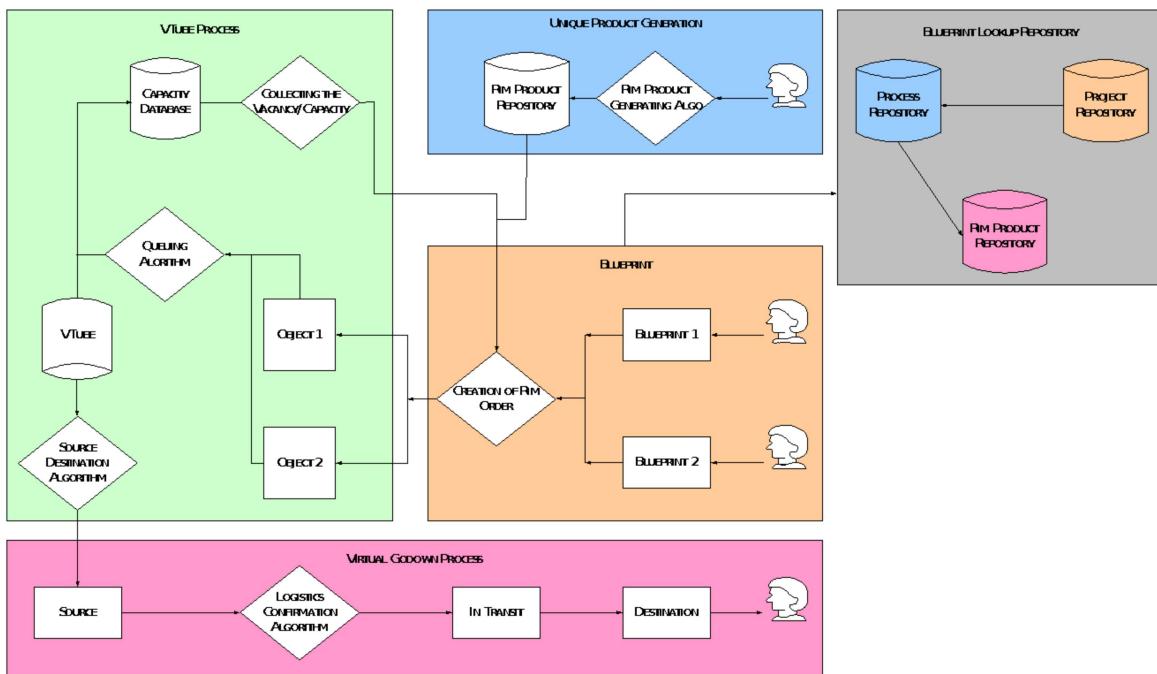


Rimulation technology provides a layered limited intelligent system with an open option as conceptualized in above Figure. A user is provided with different sets of questions that are varied based upon his/her inputs, that are further determined through, and continuously adapted via machine learning. If, for example, a user is looking for bricks, he is further asked if he is looking for bricks made of cement or sand. Such inputs finally lead to a 'Rimproduct', and each rimproduct is provided a unique ID for further reference. The technology provides the user with different options based upon prior machine learning. Different coloured blocks in figure above represent these options that can further be 'drilled down' to open more options as needed. User friendly interfaces such as tick boxes are provided for the user to select different options and so, finally make up the specifications of Rimproduct required.

Based on inputs received from the users, a Vg factor for the user requirement or for the RIM product may be derived. The Vg factor may be provided along with the specification of the product as per the requirements of the user.

Layered limited intelligent system will be used to evolve rimmaterial in the system. In first implementation, Rimulation will initiate the chain by creating a root node and leaf node. i. e. let us materials. As is known, all materials are combination of elements from periodic table. Materials will be the root node and all elements in the periodic table will be the leaf node. Rimulators in the system will able to form any material with the combination any elements or further any number of complex combinations of combinations. This can be a Merkle tree implementation, for instance ([https://en.wikipedia.org/wiki/Merkle\\_tree](https://en.wikipedia.org/wiki/Merkle_tree)). Hence, any intermediate node in the network can be tracked till element level. And so, network so formed has potential of becoming the world's repository of all materials available in the Universe. Rimulation verifies any new node creation before being added to the network. Materials added in the network can also be private or shared within the community. Such nodes need not be verified by rimulation. Those nodes will be visible only to creator or the collaborators with whom he wishes to share such nodes. Rimulation can include introducing a new root node wherein all existing root nodes will become children of the new root node. In this manner, new factors may be brought into the system. Rimulation will enable introduction of the new factors purely by consensus.

# Overall architecture of Rimulation



Above Figure illustrates a virtualgodown using the proposed Rimulation technology , wherein the virtualgodown can form part of an automated singular system that can include a blueprint process, v-tube (pipelining) process, unique product generation/ creation process, and blueprint lookup repository. Virtualgodown is a rimulator that implements rimulation's interface. The blueprint process provides a user interface to a user to submit his/her query in terms of materials needed, quantity, and time when needed. Based on the query received from the user, the blueprint process creates a set of orders. The set of orders created by the blueprint process are fed to the v-tube (pipelining) process. The pipelining process involves buffering/queuing of the set of orders based on various parameters, for

example, cost of the order, time required to manufacture, or the delivery location of the order, and the like.

When the order is selected for processing, the v-tube (pipelining) process utilizes the source destination (S-D) algorithm to select the right source (suppliers / manufacturers / traders) for the destination based on different factors. The source (i.e. the manufacture/supplier) of items ordered/ can pre-book the orders and pre-booked sources will get the order first. If no source pre-booked, the algorithm chooses the best source using pre-determined factors such as historical price/delivery performance, nearness to the user etc. The source can transfer or buy orders from, or sell orders to other sources.

There can be a buffer time for orders. If a source (maker) cancels an order after buffer time then, depending upon various order policies, the source may be blacklisted. Buffer quantity is the percentage of the order given to a source and would depend upon the user's priority. Similarly, if a user /destination / orderer cancels an order before buffer time expiry, pre-determined cancellation policies shall hold. Likewise, if a user cancels an order after buffer time has expired, aspects as per cancellation policies shall hold and the manufactured product may be rerouted to another destination.

If neither the source nor the destination cancels the order, the order will be manufactured and shipped to the destination simulating logistics as in virtual godown process, and the user receives the delivery of the order.

The set of orders while processing can also be utilized by capacity database for storage purposes thereby utilized for collecting vacant / capacity of the order. Such set of orders based on their unique characteristic may also be utilized by the unique product creation process when the user submits his query to the system for creating a new unique product (Rimproduct) in the database.

The blueprint lookup repository can be used to track/record overall process of the supply chain from the receipt of the order to the delivery of the order.

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# Rimule Creation Protocol

Rimule is an exchange medium in crypto that will be backed by material existence. Rimules are standard Ethereum ERC20 smart contract-based tokens that implement the Rimule creation protocol, wherein the Rimule creation is backed by goods manufactured or services provided. We anticipate a deflation currency, as rimules exchanged in the platform are utilized to fine tune the future. Every rimule spent in the Rimulation technology described will help human to realize their potential.

## Exemplary Use Case1

- Maker(M1) makes a sell order [*I am producing 100 tonnes*] for Rimproduct(R1) at specific space-time (ST1) for say 100 rimules. That is, maker M1 pre-books the next buy order.
- Maker(M1) confirms the order by injecting base price into Rimulation through escrow say 10 rimules. This makes M1's pre-booking sustainable. An escrow protocol (implemented using rimescrow) may be used for the purpose.
- Sell Order gets queued up in V-tube - blockchain
- Rimule creation engine[*ethereum contract*] mints 100 rimules at ST1. This is how rimule supply will be handled.
- Taker(T1) confirms the buy order from V-tube through escrow say 10 rimules. Taker will be able to buy the sell order queued up in V-tube, or S-D algorithm will map an order automatically.
- Taker(T1) buys the 100 rimules and exchanges them with the system to complete the sell order.

## Use case2

- Taker(T2) makes a buy order[*I am buying 100 tonnes*] for Rimproduct(R2) at specific space-time(ST2)] for say 100 rimules.
- Taker(T2) confirms the order by injecting base price into Rimulation through escrow say 10 rimules.
- Buy Order gets queued up in V-tube - blockchain

- Rimule creation engine[*ethereum contract*] mints 100 rimules at ST2.
- Maker(M2) confirms the sell order from V-tube through escrow say 10 rimules.
- Maker(M2) get the minted rimules from Taker(T2).

Rimule exchanged with virtual godown for crypto-assets will be archived, and therefore total rimules in circulation will be always synchronized with product/service in existence. Every rimule created in the technology will be backed by a product created, thus making the rimule a sustainable exchange medium for goods and service in Rimulation. Maker(M1) has option to use the rimule as an exchange medium for placing any further sell order in Rimulation Such returned tokens will be destroyed in the technology.

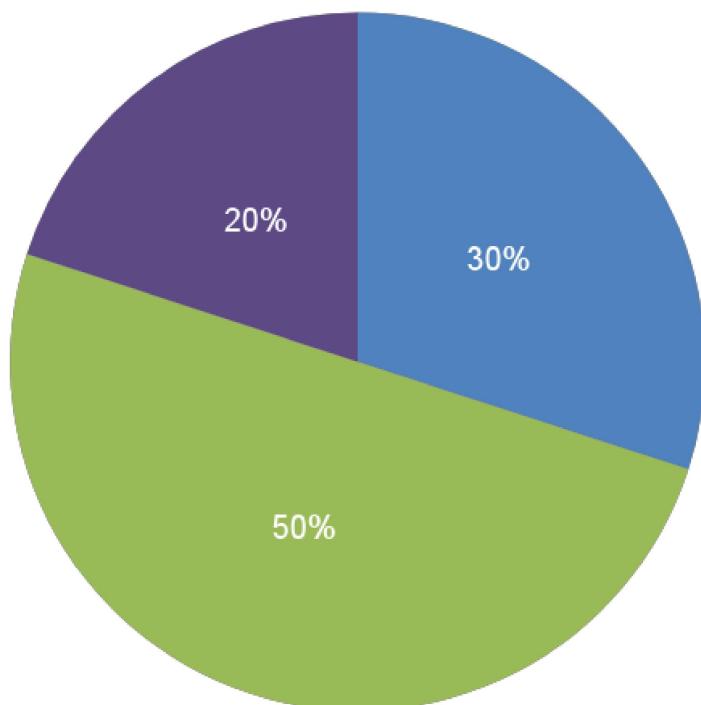
# Initial Coin Offering (ICO)

500 Million rimules will be setup in sale through ICO, with a proposed time span as under. Out of these, 150 million rimules will be put up for presale, and the remaining 350 million rimules will be put in cold storage for kick starting Rimualtion. Therefore, rimule creation formula will be Total supply = 500M rimules + Material/service in existence – Destroyed rimules that are exchanged for crypto assets.

Sale	Time span	Rimule sale limit	Coins per Ether	Coins per Bitcoin
Presale1		50 M	260	5000
Presale2		50 M	260	5000
Presale3		50 M	260	5000

## Total Rimule distribution at ICO

■ Sale at ICO ■ Rimulation kick start ■ Communities



# About Inventors

## **Vinoth Raja**

Raised and brought up in Madurai, Tamil Nadu, Vinoth earned his graduation degree from Velammal Engineering College, Chennai where he developed a passion to build his own startup that lead to formation of virtualgodown. He foresees a future where convergence of robotics, artificial intelligence (AI), Mixed and virtual reality would make current human abilities meaningless. He has adept knowledge in technology and has also published four patent applications on powering human imagination to a harmonious reality that would make humans realise their innate capacity i.e convergence of these technology will make way for better human abilities. His vision is moulded by the strong background in Computer application and AI major fields.

## **Rajasekar**

Rajasekar completed Genetic Engineering from a reputed college and then started working in Cognizant Technology Solution as a computer engineer where he was awarded an innovation award and prize money of Rs. 10 lakh for his innovation tools. An avid gamer with strong interest in AI and virtual reality, virtualgodwn is very close to his heart where one can create simulate a real world system virtually with strong potential of human improvement. After working 2 years in CTS, he joined his father's business of importing chemicals from different countries wherein he experienced firsthand problems in traditional business methodologies that virtualgodown seeks to overcome. To everyone virtualgodown (coined term) may appear as "Go Down" but Rajasekar has a unique vision. He thinks virtualgodown as "God's Own" company.

# About the Company

# Advisors

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