

TOKENIZING AND LIBERATING THE MOBILE DATA MARKET

CRYP2NOVA

Token sale Whitepaper 10 July 2017

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“We are here to put a DENT in the Universe.”

Steve Jobs

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1. Executive summary

The world is changing, barriers are falling, the usage of the Ethereum Blockchain and Smart Contracts is removing the middle-men and reducing costs across several industries. Banks are changing the way they do transactions while the industry is reducing complexity in manufacturing, supply chain and logistics. This white paper describes the DENT Exchange we are building: the transparent marketplace for selling, buying and donating mobile data packages.

Mobile data is the next commodity to be liberated

Mobile data access is becoming an essential human need, as much as hot water and electricity. However, according to GSMA, in 2016 still less than half of the world's population uses mobile data. For data users, usage vary vastly across geographies, which shows the huge potential to be unlocked. Reasons are, besides network availability and handset affordability, the perceived high cost of data, which varies from below 1 USD / GB to well above 10 USD / GB between operators and regions for domestic usage. Furthermore, operators are locking-in customers with rigid data offerings that are made to expire when unused within a given time, which lead to even higher prices / GB that customers effectively pay. As a consequence of the customer lock-in, data usage abroad can become prohibitively expensive with prices / GB in the hundreds or thousands of USD. All this generates billions of dollars profit for operators but inhibits unlocking the full potential of mobile data.

We want users to own their mobile data and bandwidth. They need to be able to freely sell or donate unused data to other users. World-wide.

Three Disruption Megatrends on Mobile Operator Business that DENT is addressing

1. Liberation of Mobile Data. DENT enables a "Data Sharing Economy" where users are able to freely buy, sell and donate their mobile data, from any user to any user. The DENT Exchange acts as horizontal marketplace for trading of mobile data. The DENT Token will be the world-wide currency for Mobile Data between telcos and the user community.

2. Disruption of international Roaming. DENT facilitates the removal of data roaming cost drivers, such as expensive routings between telcos. For example, with local data break-out, the foreign

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telco terminates the user traffic directly to the internet, instead of routing the pay-load to the home telco.

3. Facilitation of mobile data purchase. DENT enables automated purchase capability of data packages for consumers and IoT devices. The user always gets the best price from the most suitable operator in his region, without having to worry about buying too much or too little data. Operators can easily connect with the DENT platform to serve a global customer base, without the need to establish silo'ed own platforms.

DENT driven liberation of the mobile data market towards an open marketplace

DENT will be the global exchange for mobile data where - in the final scale - the world's mobile data is sold, bought or donated, just like other commodities such as currencies are traded today. DENT will make data pricing transparent, and through automated bidding increases efficiency of purchase, just like spot markets and mobile advertising today.

DENT Tokens will be the global currency for the exchange of mobile data packages. The possibility of exchanging a package to a more suitable one, especially in the advent of eSIMs will allow the use of multiple operators on a single phone will drive telcos to compete.

Mobile Data Liberation – DENT aims to turn unused $4.8 Billion USD per month into usage

According to a recent study of CISCO, the world-wide mobile data grew year on year 63% to 7.2 billion Gigabytes per month in December 2016. According to a study of Parks Associates, mobile operator data revenues stood at $386 billion USD in 2015, equivalent to $32 billion USD per month. Assuming just 15% to be unused due to expiry, in a way users lost a value of $4.8 billion USD. In a more transparent and connected market, this value shall be unlocked to drive mobile data usage.

References: CISCO study about data traffic: http://bit.ly/1W26UQo
Parks Associates Study of Mobile Data Revenue 2015-2010: http://bit.ly/2sGwaar

Layperson comparison to gasoline

The gasoline market is also controlled by a few companies, but if you buy 100 liters of gasoline, you can use the gasoline as you want or pass it on as you like. This is unlike mobile data today, where you cannot give your unused capacity to someone else. Some roll-over or pooling has been introduced but these remain islands and – in the case of data roll-over, data will still expire if not used in the following month.

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2. About the Company

DENT Wireless Ltd, based in Hong Kong, was founded in 2014 as Commando Coder Ltd when Tero Katajainen decided to develop an automated FOREX trading system with built-in risk management functions. Parts of this product are now being integrated into the DENT Exchange to allow buying, selling, and donating of mobile data packages on the marketplace. In 2017, the other founders invested in the company and joined Tero in the adventure to develop and bring DENT Exchange to the world.

2.1 The DENT Wireless Team

The DENT Team is a unique combination of serial entrepreneurs, industry veterans, specialists in Ethereum smart contracts, open-source applications, payment systems, mobile apps and secure large-scale transaction systems.



Tero Katajainen, CEO and Founder

DENT Wireless CEO and Founder, Tero Katajainen, originating from Finland, has co-founded several Internet startups in his 20-year career. He holds a Master of Science degree in Electrical Engineering from University of Tampere, Finland. His deep knowledge about FOREX trading systems is a big advantage for DENT. Tero was also one of the first developers ever to implement direct mobile operator payment systems to consumer applications. As a specialist for transactional systems and Blockchain, Tero is the mastermind of all tech at DENT.



Mikko Linnamäki, Co-Founder

DENT Wireless is backed by Mikko Linnamäki, Internet pioneer and serial entrepreneur with a track record of founding successful Internet businesses since 1994. Mikko, also from Finland, is Co-founder of DOVECOT Oy, the company behind DOVECOT, the world's most popular IMAP Server with a world market share of 72% and over 4 million installations. An estimated 2,5 billion users are entrusting their Email storage to Dovecot every day. Mikko recently received a patent for his invention "Ad Hoc Injection of IMAP Objects".

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Andreas Vollmer, Co-Founder

Andreas is the Mobile specialist in the team with 12 years' experience developing Mobile Apps, from Symbian in 2005 to iOS and Android today. Andreas is Co-Founder of leading German mobile app development company TDSoftware, which is developing apps for companies such as Mercedes-Benz, Audi, Deutsche Post, GLS, and others. Andreas is also an expert in mobile CRM systems, and will deploy the latest tools to analyze user behavior in order to accelerate user growth and hit target metrics.



Michael Wirth, Director Payment Systems, GM UK & Ireland

Michael is taking care of the perfect flow, analytics, and easy user experience for the exchange of DENT Tokens in our customer- and carrier-facing applications on mobile, Web and M2M. Michael has 20 years of experience in large-scale transaction projects. He was Director of Products and Services at eNett International, a Travelport company and leading specialist for payment solutions in the travel industry.



Ville Sundell, Smart Contract Specialist

Ville is a Finnish smart contract developer who has pioneered smart contract based legal entities, being the first to create companies solely on the Ethereum blockchain without any human intervention through Etherprises LLC. Ville has over 10 years of experience on limited and mission critical embedded systems ranging from automotive to mobile systems, being the ideal background for secure smart contract development.

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2.2 The DENT Advisory Team



Dr. Rainer Deutschmann, Advisor

Rainer advises DENT Wireless on how to create a long-term sustainable and scalable business which creates a win-win for all market participants – customers, telcos and DENT. He brings in 20 years of experience in consulting, telco and tech industries, at companies like McKinsey, Deutsche Telekom and Reliance Industries. Rainer held senior executive positions in strategy, product and innovation across mature and developing markets. Most recently, as Chief Product & Innovation Officer, Rainer with his fellow leadership team launched Reliance Jio, the 25 billion EUR telecom and digital services venture of Reliance, and acquired 100 million customers within six months. Jio disrupts the telco landscape to democratize mobile broadband for the 1.3 billion people in India.



Ransu Salovaara, CEO of TokenMarket

Ransu is a financial industry executive specializing in crypto-currencies, digital assets, and blockchain technology. He launched Europe's first Bitcoin-backed Exchange Traded Instrument, BitcoinETI, that is listed on the Gibraltar Stock Exchange as well as traded on the Frankfurt Stock Exchange. TokenMarket is an information, crowdsale, and exchange platform for digital assets.



Mikko Ohtamaa, CTO of TokenMarket.net, crypto technology specialist

Mikko is Co-Founder and CTO of TokenMarket and an early blockchain and Bitcoin expert, as well as Python and JavaScript developer and an Open Source advocate, taking care of the back end systems of the Token Sales on their platform.

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3. Power to the people – telco's most valuable asset

DENT gathers mobile operators' users into a collective group with billion dollar buying power, giving targeted global partnerships sufficient weight

The most valuable asset for the mobile operators is you, the customer. The value of a customer is determined by his average spend per month (ARPU), how long he stays with an operator (the inverse of what is called "churn rate"), and the customer acquisition and retention cost. Taking global averages of about 10 USD per month blended ARPU, a 25% annual churn rate, and customer acquisition and retention cost of 20% of operator service revenues, the lifetime value of a customer is approx. $460 USD. No operator wants to risk losing this value.

Our strategy to liberating the data market starts with you, and ensures sufficient negotiation power with the telcos

- We invite and unite users in the DENT community
- The DENT community represents a "union" of telco customers, which leverages its collective power to liberalize mobile data
- The DENT team represents the DENT community in partnership negotiations with the telcos
- Assuming a start with even just a few million customers, the DENT community represents a collective buying power of $460 USD per user, reaching hundreds of million USD at stake for a telco
- Telcos will want to secure and grow this value, rather than handing it off to a more open and innovative peer players

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4. Our roadmap to launch and scale DENT

Phase 1: Development and DENT user acquisition

- Organize mobile operator customers in key countries into a collective power by acquiring members with the help of the DENT Token sale and other incentives, such as sign-up data bonus of operator partners
- Launch the DENT Exchange on Ethereum blockchain for buying, selling, and donating mobile data packages
- Partner with telcos to offer mobile data packages and enable user-to-user data transfer

Phase 2: Enrich domestic offering via the DENT Exchange

- Grow DENT community and operator partner base to allow their users to transfer data packages even across networks
- For multi-national operator partners, the DENT Exchange represents an ideal platform to facilitate international data transfer for their user base
- Enable users to donate excess data as DENTs, e.g. to people in developing countries

Phase 3: Provide international data offers via DENT Exchange

- Lobby with public bodies, such as EU regulation (which successfully enforced "roam like at home" and removed roaming fees within the EU) and governments of key countries to discuss rules for data liberation for their citizens
- Continue adding more users to the network, start interconnecting domestic DENT markets to create the international DENT Exchange
- Allow users to internationally sell and buy data packages
- → DENT Token is the standard instrument for world-wide mobile data exchange

A simple use case of how DENT Exchange will work internationally:

Mike is a customer of a US carrier, he owns 2,000 DENT Tokens. As he lands in Australia, he accesses the DENT marketplace at the airport though Wi-Fi and buys the mobile data he needs. This data could, for example, have been offered by Jane, who is a customer of an Australian carrier. Mike needs no extra agreements with any carrier, no SIM card changes, he just starts to use his phone on the Australian network. Jane is happy to earn DENTs and will spend them on her next trip to Europe during her summer holidays. Mike's US carrier earns transaction fees, and Jane's Australian carrier has increased his utilization against his respective cost share.

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5. The world-wide currency for mobile data exchange – The DENT Token

The currency used in trading, the DENT Token, is what powers the platform. The actual sale, purchase and donation of data packages enters the Ethereum blockchain, utilizing ETH. The instruments, i.e. data packages, will be Smart Contracts in the Ethereum blockchain. DENT Exchange will drive Ethereum Smart Contracts, effectively making the system a blockchain-based trading platform. The crowdsale will allow participants to purchase DENT with a low starting price, before it becomes used in the exchange.

Should the exchange become a de-facto place for trading mobile data bandwidth, it would then become the principal method for determining the floating price of mobile data worldwide. Telcos, market participants, and end-users will all interact in a true market driven way to determine the current price. Eventually this will lead to increased competition, providing new packages to the exchange and further enable the DENT Exchange to become the dominant force in the mobile data space, utilizing the DENT currency.

What can users do with the DENT Tokens?

- When the DENT Exchange is live, users will be able to use DENT Tokens to buy and sell data on an international marketplace.
- In the build-up phase, users obtain DENT Tokens to participate in the DENT community to use the collective power together with fellow mobile users to demand data liberation and changes in the way the telcos do business with mobile data.
- DENT Tokens can be acquired at the crowdsale or later from marketplaces.
- The DENT mobile app serves as the central interface for users to buy, sell or donate mobile data packages. Mobile app downloads are being incentivized with DENT Tokens.

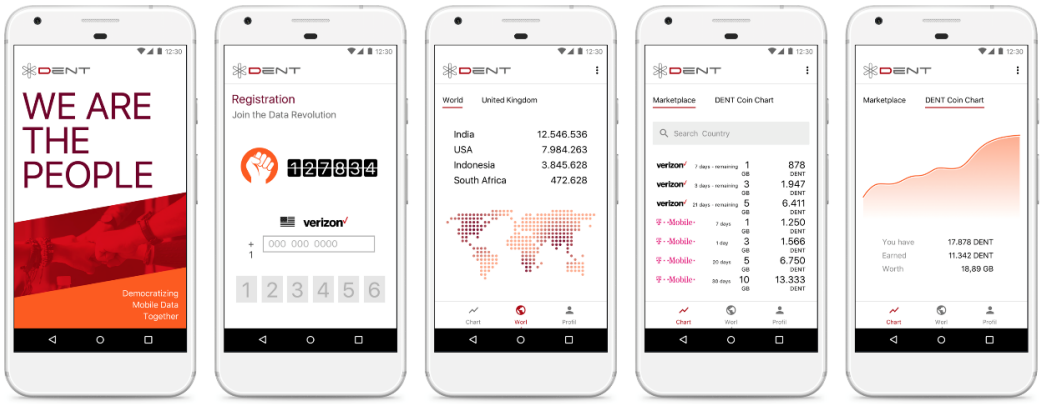


Image: The DENT Mobile App

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6. DENT for developing markets – "Gigabytes for Africa"

DENT aims for donations of unused mobile data to the ones that need it

DENT wants to help the developing world by providing access to mobile data. Data packages may be donated through the exchange by the users. We will look for strategic partnerships with operators enabling access to information in rural areas.

In 'The Sustainable Development Goal 9' of the United Nations, the UN calls for building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation. Mobile data is specifically mentioned as a key component in these goals:

"*Infrastructure and economic development also rely on information and communications technology. Mobile cellular services have spread rapidly around the world, allowing people in previously unconnected areas to join the global information society. By 2015, the percentage of the population living in areas covered by mobile broadband networks stood at 69 per cent globally. In rural areas, the share was only 29 per cent.*"

Source: Report of the Secretary-General, Progress towards the Sustainable Development Goals, E/2016/75

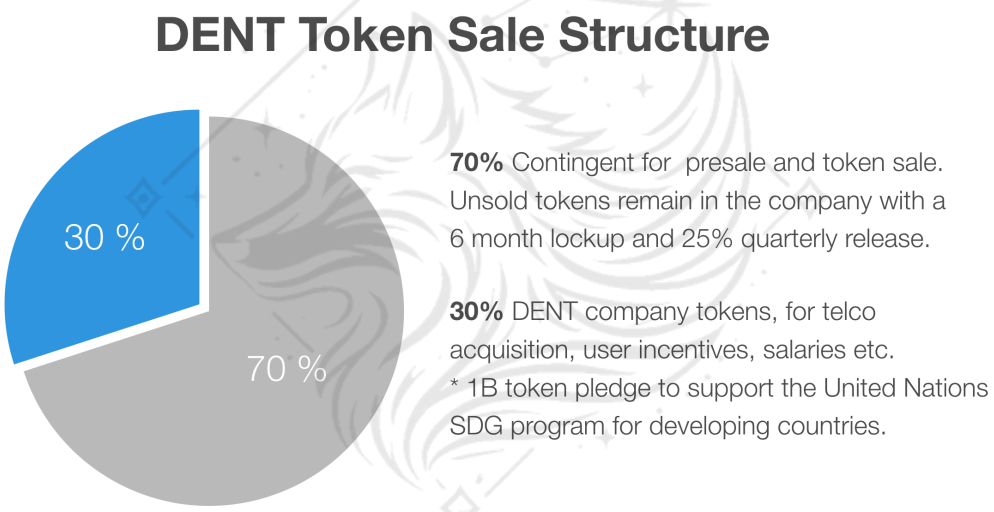


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7. The DENT Token Sale details

- Estimated token value in ETH offered in this token sale: 152,000 ETH,
  (subject to variations through the crowdsale)
- 100 Billion (100,000,000,000) total DENT Tokens created, of which 70% are sold in the token sale (presale + public token sale)

The Company will conduct a public sale of Tokens (the "Crowdsale"), which will begin at 21:00 HKT (13:00 UTC) on July 12, 2017 (the "Crowdsale Launch Date") and end at 06:59 HKT (22:59 UTC, July 26) on July 27, 2017 (the "Crowdsale End Date") or when 70,000,000,000 DENT ("DENT") Tokens has been sold, whichever is earlier.



- Exchange Rate: 1ETH = 400,000 DENT*
- Token Type: Apps token to purchase and sell mobile data packages
- **30% of DENT tokens remain at the Company** for telco acquisition and market seeding, user incentives, salaries and bonuses.

- Any Tokens that remain unsold at the crowdsale end date (26 July 2017), will be added to the Company Inventory and will remain in a locked state for at least six months from the crowdsale end date. 25% of the total amount of the unsold tokens will be released from the lock up quarterly, first time at the date of 6 months after the crowdsale end date.

- The Company will pledge 1 Billion, or 1% of the DENT Tokens to further the UN SDG program for the purpose of enabling mobile data access in developing countries

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- **Bonus Tiers:** DENT Bonus tiers allocate bonus tokens to buyers as per the following schedule based on sold volume in ETH:
- Tier 1: Up to 45,000 ETH: 10% tokens as a bonus
- Tier 2: From 45,000 ETH and up to 90,000 ETH: 5% tokens as a bonus
- Tier 3: From 90,000 ETH: No bonus Tokens

- No tokens will ever be added to the supply.
- Founders will not take any DENT Tokens off the table.

** The conversion rate ETH/ DENT will change during the crowdsale due to the bonus discounts. This price is without any discounts*

Timeline of the DENT Token sale:



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8. Driving forces for appreciation or depreciation of the DENT Token

As the DENT Token come from a limited pool and the market has the possibility to expand as more and more data packages are introduced into DENT Exchange and as those data packages have a price in FIAT currencies, the price of DENT against those currencies might rise due to the growing demand in face of limited supply. For market participants, this presents a unique opportunity to leverage an existing market.

The value of DENT may appreciate or depreciate

If mobile data products are relatively cheaper to buy from the DENT Exchange rather than from current markets, or packages become more attractive due to f.e.x being able to sell excess data, users will need to buy DENT Tokens to buy those packages. The amount of DENT available will not increase, this might cause the value of DENT to appreciate due to increased demand, the supply being fixed.

With DENT being the token in the mobile data space, the rate of appreciation might follow the size of the mobile data market traded in DENT. According to GSMA, the size of the mobile data market is predicted to increase, larger market traded in DENT could lead to DENT price increase.

In general, the value of DENT most likely reacts to the market value of the data packages in the DENT Exchange.

Risks: Unknown regulatory measures towards cryptocurrency and operator slowness

As the cryptocurrency market is still young and the technology is in its infancy, there might be issues with scaling the transactions to mass market speed. There is also uncertainty regarding potential cryptocurrency regulations in the future. We are building our services on Ethereum, and should Ethereum fail, we would have to change the technology platform to another blockchain technology.

As we are disrupting an existing market of mobile operators, who provide data packages to the market, it can take longer than anticipated to get the marketplace filled with supplier-side products.

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9. DENT leveraging key drivers of the telco industry

9.1 Key drivers and trends in the telecommunications industry —Pre-cursors to a "perfect storm" for DENT Wireless

9.1.1 Globalization of consumers and businesses with increasing services transparency.

Global travel is on the rise, and businesses are increasingly spanning across multiple geographies. Telecommunication service provisioning must cater to those global needs, and provide global services despite the local nature of telecommunications infrastructure, leveraging global entities and partnerships. Telcos have responded to the globalization by forming regional and global conglomerates, partnerships and joint ventures.

However, there is no truly global telco service today, on par with the OTT (Over-The-Top) players, who run off a single platform. Telcos have traditionally leveraged local platforms for local markets. More and more, local platforms are replaced by global platforms, which is the only way how to compete with the OTTs such as Google, Amazon, Facebook, WeChat and WhatsApp, to name only few, who develop once and scale their platform globally. Global platform usage has taken off in the telecommunications industry. Examples are platforms for global roaming, several white label platforms for cloud based communication and other SaaS offerings, and the take-over of Jibe mobile by Google to adopt the GSMA RCS standard, which likely becomes a core element within the Google Fi proposition.

The solution we deliver: DENT will provide the missing global platform to the consumers, who are weary of being locked to one operator in one country and of being limited in terms of mobile data purchase and usage. With DENT for the first time consumers will obtain full transparency on cost of the data they use, and they will have access to a global mobile data pool as if it was gasoline.

DENT will also provide the missing global platform to the operator ecosystem, to trade the key commodity - mobile data. The DENT platform can be employed locally in single markets with single operators, but it is designed to scale cross operator and cross geographies. This is vastly different from the traditional telco model which does not scale beyond the realm of the individual player, and provides a much more cost-efficient platform approach. DENT is open to partnerships and will make it easy to partner with them, with ready to use and adaptable interfaces.

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9.1.2 Smartphone adoption and customer digital services literacy.

Customers now naturally use their smartphones to communicate via video, watch movies, manage their telco subscription and to purchase goods and services. Less and less there is a need for a local POS, and even voice interaction is increasingly supported by chat bots.

The solution we deliver: DENT provides a fully digital experience, without the need to ever visit any POS or call a call-center. Buying, selling and donating data are all easily facilitated through a smartphone app, which works in parallel or – if the operator agrees – integrated with the operator self-care app functionality to give information about the customer's actual data usage.

9.1.3 Top and bottom-line pressure on telcos

Telcos are increasingly struggling with maintaining their revenue line. Despite the data growth in users and usage, the decline in voice and SMS can hardly be compensated, and customers increasingly consider their telco service as commodity like electricity and water. Telcos respond by trying to differentiate with products and partners, but a sustainable differentiation has surely been to deliver an outstanding quality of service (coverage and speed) for a fair price.

Consolidation and retirement of legacy technologies in telecommunications industry are in full swing, driven by the ineffectiveness of building and maintaining multiple mobile infrastructures in one geography, especially for legacy networks. Good recent examples are in India, accelerated by the 4G pureplay market entry of Reliance Jio, where the #1 Bharti Airtel has taken over several smaller players, #2 Vodafone is in process of merging with #3 Idea Cellular, and #6 RCom & #7 Aircel shareholders have approved their companies' merger.

The solution we deliver: With DENT the telcos obtain a vehicle to differentiate and get close to the consumer. DENT provides a cost-effective distribution channel, and allows to experiment with new pricing schemes to determine the sweet spot for data sales. The cost effectiveness stems from the inherent architecture of being blockchain-based and by leveraging one central platform which scales across all market participants.

9.1.4 Disruption from within.

History shows that untapped profit pools eventually get disrupted. In the case of mobile data, vast differences in profit pools exist across global geographies and operators, where ARPU levels span a factor of > 20x, despite main cost drivers such as spectrum and infrastructure being comparable. T-Mobile US and Reliance Jio are good examples of disrupting in their markets from within, while establishing and maintaining profitable business models. However, in other cases short sighted disruption purely on pricing was not sustainable, as the telco players need to be able to maintain the required CAPEX for coverage, capacity and next generation infrastructure provisioning.

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The solution we deliver: DENT will allow the telcos to be part of the disruption, rather than being disrupted themselves. Telcos can become part of the journey to a fully transparent and fair ecosystem. For global data usage, especially for IoT use cases, dedicated MVNOs have been established. One example is Cubic (www.cubictelecom.com) which serves the likes of Audi and HP for their global needs. DENT is open to partner with existing MVNOs or even establish an own MVNO if required, in order to serve the global customer base.

9.1.5 Regulation in favor of consumers and pre-cursors of data sharing economy.

Over the last years the regulation in EU has been driving down interconnect and roaming rates. Most recently the long anticipated "roam like at home" proposition is mandated and took effect starting June 15, 2017 https://ec.europa.eu/digital-single-market/en/roaming. Customers are free to use their data volume as purchased with their home operator, across the entire EU operator landscape. Pre-cursors of data sharing propositions are visible in some markets, such as "data roll-over" to the next months for un-used data, data pooling within a certain user group (e.g. a company), data voucher transfer to any other subscriber (such as implemented by Reliance Jio). However, all these solutions are restricted to a certain user group, a certain geography, or for certain data plans.

The solution we deliver: DENT fuels the already ongoing movement towards a greater transparency and fairness, as seen with some operators who provide sharing, transfer and pooling propositions for their customers. With DENT this will come to full fruition, and will available to all customers. DENT will finally make data packages comparable, stripping off unnecessary bells and whistles.

9.1.6 New technologies. eSIM, 5G and IoT.

With eSIM the physical SIM card is being replaced with an on-device secure chip. This offers the opportunity to provision a user "over the air" to a certain mobile operator without the need to physically replace a SIM. It is yet to be seen how user friendly the actual implementations are going to be. Business Models range from the need to subscribe with an operator up-front and then only to provision the mobile device, to having the full choice of operators right on the home screen of the mobile device itself.

With 5G, a number of new use cases and businesses will be supported by mobile operators. Not only the bandwidth will be further increased beyond 4G and 4.5G (carrier aggregation), but also new functionalities are introduced and latencies are further reduced to ms time-scales by novel architecture concepts such as edge-computing, network function virtualization, and network slicing.

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Industrial IOT and – as supported by recent announcements of Vodafone – also consumer IoT is expected to become a next growth engine. While the majority of connected devices will be aggregated through non-SIM based connectivity, the SIM based connected devices will require novel ways of management and to support ease of use for the entire IoT solution

The solution we deliver: DENT is set to embrace the new technologies and support the resulting use cases.

The DENT market place perfectly complements eSIM enabled devices, so that the user can freely choose the optimal data package needed, nationally and internationally. This ease of use will require the support of mobile terminal OEMs and telcos.

DENT Wireless aims to provide the most cost efficient and user-friendly architectures and technologies. For international roaming today, the data traffic of the roaming customer is sent to his home operator, and only there is terminated into the internet. This is done to have control over the data traffic for billing purposes, and is used to impose for many customers perceived high roaming charges.

However, an alternative architecture called “local break-out” (“LBO”) can be more favourable and has long been discussed – also in the context of the EU regulation. With local break-out the customer’s traffic is directly terminated into the internet from the roaming network, thus avoiding (high cost) international data transfer and associated latencies, much more in line with the spirit of 5G, and giving the host operator much more flexibility to serve the roaming customer with favourable rates and dedicated quality of service.

The DENT platform – being fully automated and globally scalable – is ideally suited to support IoT use cases, where a connected device with certain software requires dedicated connectivity, but all this at ideally zero maintenance. Connecting IoT devices automatically to the DENT platform can guarantee availability of mobile data at fully transparent cost control.

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9.2 Why Mobile Roaming up for disruption – and the role of DENT

- Drivers for the high – and sometimes incredibly high – retail prices for roaming customers are interconnect costs, data carrier fees, margin to the home operator and others
- Total costs could be reduced by terminating the customer's data traffic directly into the internet, rather than routing it back to the home operator, as well as by reducing the expected margin and by otherwise smart data traffic management (caching etc.)
- Local break-out for data traffic is not employed today. Reasons are multi-fold, such as
    - Economic considerations of local retail vs. international wholesale prices
    - Existing bi- and multilateral roaming agreements, which are further complicated by the balance of in- and out-roaming customers, which are also optimized by traffic steering into different roaming networks
    - Lacking billing relationship of the local provider with the in-roaming customer
    - Overall traffic steering considerations, e.g. cashing of local content
    - Standard practise to avoid direct customer (marketing) communication to foreign in-roaming customers
    - In case of pure data local break-out, the customer would not be reachable on GSMA voice and SMS
    - For first-time network connect, the customer has to manually select the right operator for local break-out (unless it happens to be the home operator pre-defined preferred network)
- DENT is set to provide the platform to overcome those challenges
    - Data pricing will be at local level, through the transparent DENT marketplace
    - No complex roaming agreements need to be considered
    - Billing relationship is already established between the global DENT user base and the DENT platform, which will be made available to all operator partners
    - All customers of the DENT community will have the DENT mobile app, so communication will be targeted and direct to customer, rather than sending old-style SMS
    - Voice services can be provided through IP services, such as WhatsApp, Skype, or an own DENT communication platform; in addition, DENT can provide circuit switched routing services to be always reachable
    - DENT mobile app will also give an easy to use access to the right roaming network for local breakout
- There are further opportunities to disrupt the roaming market and provide a global service, such as by leveraging an own MVNO or by partnering with innovative service providers

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9.3 Summary of mobile operator benefits: Revenue increase at lower cost in an expanding market

- Increased revenue thru easier access to buying demand world-wide
- Increased revenue thru the user-to-user sales, while getting commissions
- Easy to launch new services and packages, just introduce the package to the exchange
- No special agreements with the operators, just connecting to the DENT Exchange
- Cost efficiency, though one central platform approach with easy to connect middleware and APIs; scales favorably with users and usage, no increased human effort
- Platform to test data proposition, such as reaction to seasonal pricing levels
- Enables M2M (machine-to-machine) exchange of mobile data packages with IoT devices Example: A Vehicle in a GPS-tracked fleet manages its own Internet connectivity using DENT Exchange.

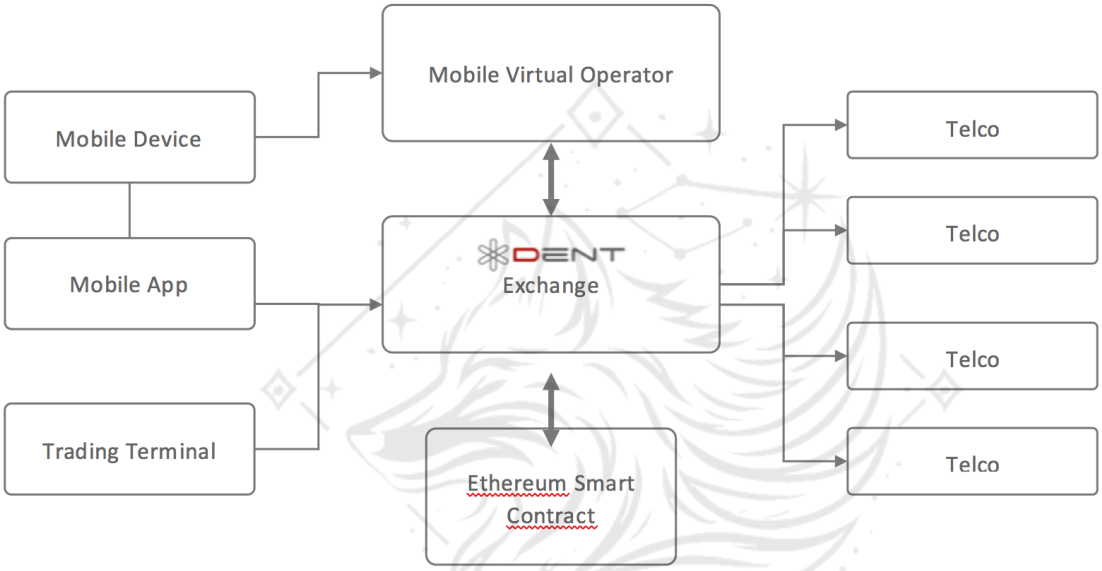
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10. Technology – Architecture

10.1 Architecture Overview

The DENT Exchange is a mix of current state-of-the-art technologies. The trading side of it is familiar from Stocks, Forex, etc., while the connectivity between DENT Exchange and telcos resembles that of a virtual operator. The technological challenges there are well known and defined.



10.2 Component Overview

10.2.1 DENT Web-app

The DENT Web-app allows market participants to view quote feeds, see the order book and market depth, place buy/sell orders, review portfolio, order history, etc. It is analogous to FOREX trading terminals such as MetaTrader.

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10.2.2 DENT mobile app

The mobile app is a simplified version of the Web-app. It allows the user to see quote charts and place basic orders, as well as see current portfolio and DENT balance.



10.3 DENT Exchange Component Structure

DENT Exchange is the main container for the business logic. In addition to being a trading platform, it will provide integration with 3rd party telcos and the Ethereum blockchain.

DENT Exchange contains the trading instrument repository (mobile data packages), manages the market participants and their portfolios, distributes price data feeds to trading terminals, calculates the spreads in the bid/offer prices, executes and manages orders, etc. As such it is a usual trading platform.

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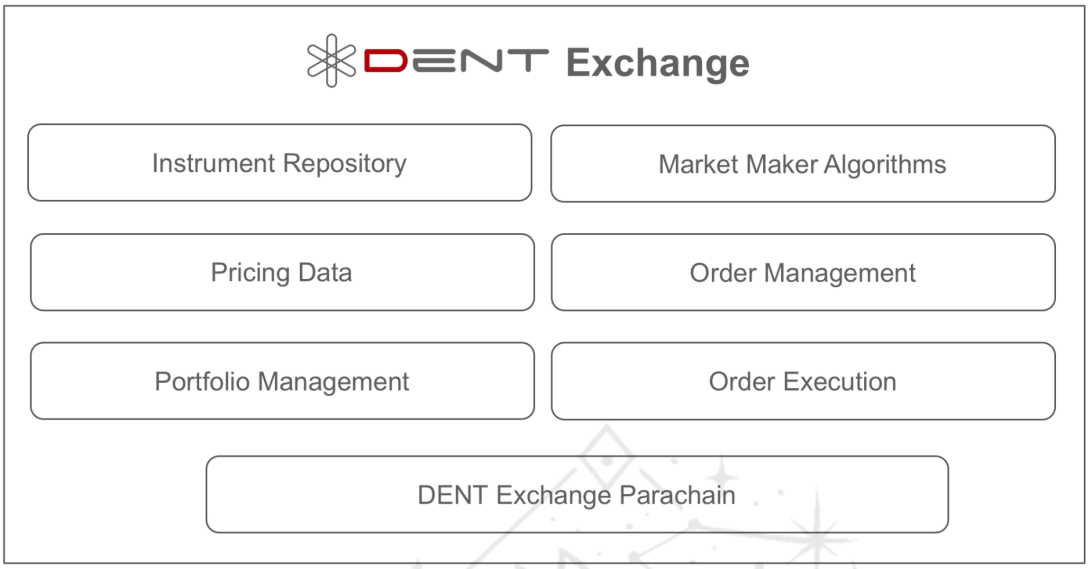


Image: DENT Exchange Components

- Instrument Repository
  The repository contains information of the data packages available at DENT Exchange, such as a 1GB package from a telco with a certain expiry. The information is the metadata not stored in the blockchain. Each instrument references a smart contract in the Ethereum.

- Price Data
  Price data, including real-time bid & offer order book, is stored in a high speed cache and fed back to the webapp and mobile apps. The data includes last closed trade price, current highest bid and lowest offer and may contain trade volume and order book depth data. Historical price data is available for the 1m, 5m, 15m, 30m, 1h and 4h periods.

- Portfolio Management
  A trader in the exchange will have a portfolio of packages owned . Portfolio management takes care of updating the portfolio according to executed trades and keeps the trade history.

- Market Maker Algorithms
  Market maker algorithms manage the final offer and bid prices for packages, managing the price spread and controlling the market supply with the parameters set at the Initial Data Offering.

- Order Management
  Order management takes care of the acceptance of bids and offers from the traders in the Exchange, including risk management together with the portfolio management. It feeds the incoming orders into the market maker algorithms for final placement in the order book.

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- Order Execution
  Order execution matches bids and offers in order to fulfill the orders. Upon a fill the Ethereum smart contract is called for the financial transaction part and the fulfilled order enters into the portfolio.

- Proprietary API
  Telcos can expose their APIs to the DENT Exchange, which will call them via custom adapters, or opt to install a DENT supplied API Listener on their network.

- DENT Exchange Parachain
  The parachain acts as an escrow between the Ethereum blockchain and DENT Exchange, to allow for faster execution of trades.

The exchange differs from a FOREX broker in that the order execution drives the Ethereum smart contract and also integrates the exchange with external systems. Thus, it acts as the coordinator between DENT based assets and real-word mobile data packages.

10.4 Ethereum smart contracts

Ethereum smart contracts execute the financial transfers of DENT. They are driven by events from the DENT Exchange. Upon execution of contracts the exchange then takes the focus and handles the 3rd party transactions.

10.5 Virtual Operator / Telco

The Virtual Operator or telco acts as a market maker, provides mobile data packages for end-users and is a payment gateway for conventional Premium-SMS/USSD data package purchases. It will be used to seed the exchange.

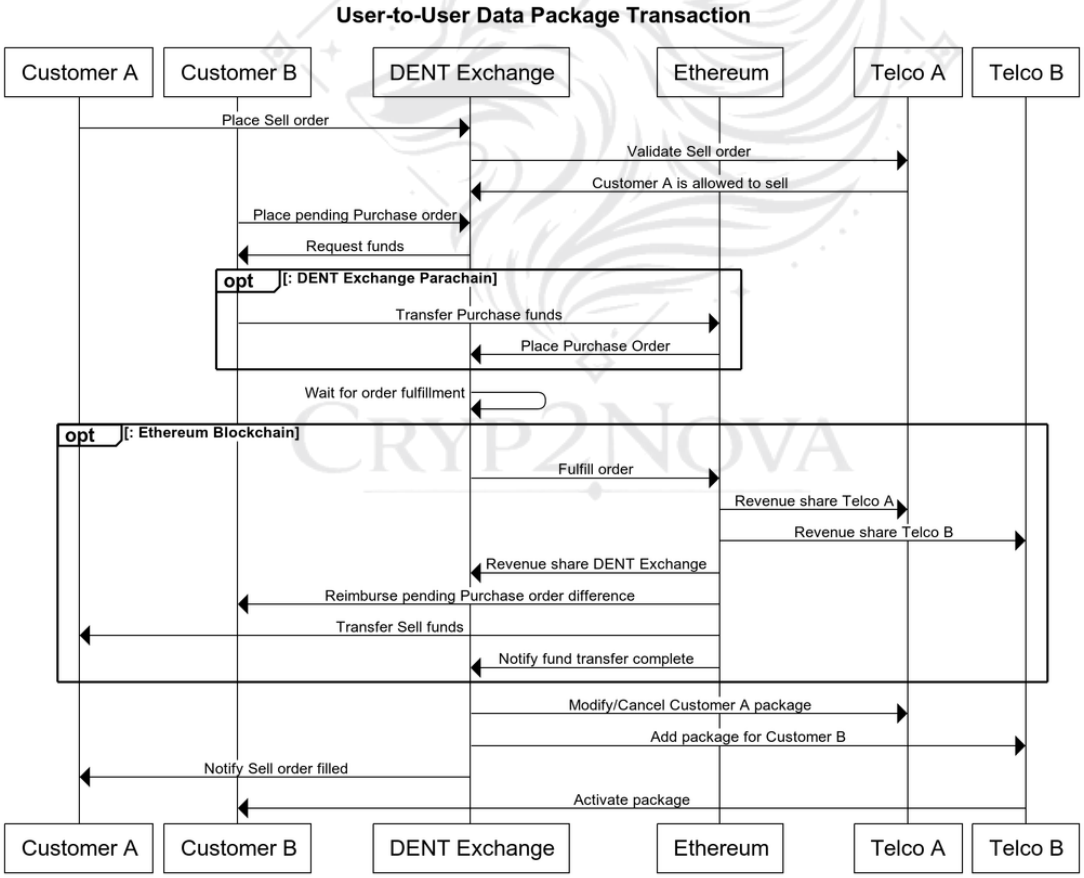
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11. Technology - DENT Exchange use cases & workflows

11.1 User-to-user data package transactions

User-to-user transactions involve one user placing an offer in the DENT Exchange and another one placing a bid respectively. In the case the selling parties mobile data package plan is to be split, the telco of the selling party will need to clear and lock the offer first. The buying party will lock the purchase funds in the DENT Exchange Parachain, after which the order enters the books.

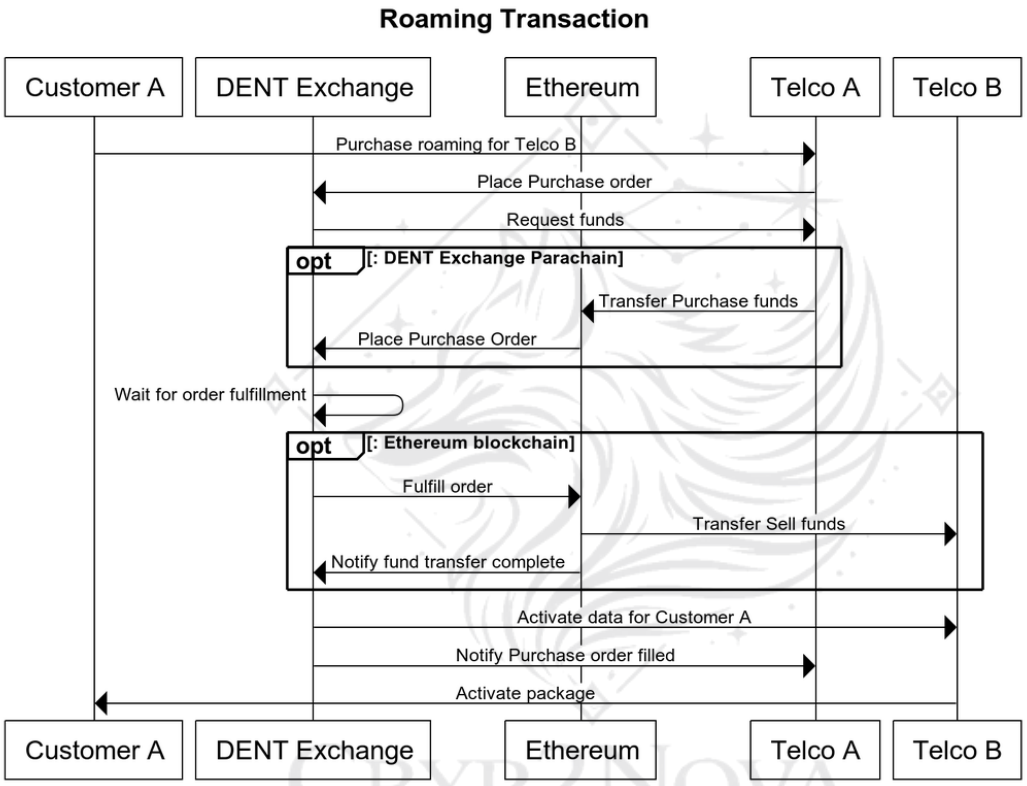
Upon fulfilment, the main smart contract in Ethereum is triggered and revenue share occurs according to the rules set at IDO (Initial Data Offering). After fund transfers DENT Exchange coordinates the possible splitting or cancelling of the data package from the selling party and activates the acquired package for the buying party.



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11.2 Telco data roaming, data package transfer from user to user internationally

In a roaming case a customer wants to visit the network of another telco. The telco servicing the customer will get the request and arrange for an offer to be placed in the DENT Exchange.
Similar to the user-to-user case, the offer will eventually match with a bid and the order will be fulfilled. DENT Exchange will again coordinate the activation of the acquired package.



11.3 DENT Exchange Initial Data Offering (IDO) for telcos

The instrument traded in the DENT Exchange will enter the market via an Initial Data Offering. Operators and wholesalers of mobile data packages will define the instruments, such as US Sprint 20G packages, and offer them to a group of traders in the DENT Exchange. The size of the initial offering will be set by the provider of the mobile data package and DENT Mobile.
DENT Mobile will handle the IDOs, as well as act as a virtual operator, providing depth to the market with their own data package offerings. Any proceeds as well as eventual profit from the virtual provider business will be revenue for DENT Wireless.

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12. Summary

- DENT liberalizes mobile data to be traded as easy as any other commodity
- DENT unites a DENT community of users and enable them to easily buy, sell, and donate mobile data, worldwide
- The DENT community will combine a collective buying power to facilitate partnerships with telcos
- DENT provides the DENT Exchange, based on Blockchain technology, and an easy to use DENT application
- DENT Wireless is driven by an experienced founder and management team that consists of serial entrepreneurs, industry veterans, internet pioneers, blockchain and payment system experts that have executed large transaction and secure data systems before
- The DENT launch and scale-up is driven in three phases, from DENT community building, enabling domestic markets, to facilitating a global sharing economy for data
- Our goal is to make DENT Token the world-wide currency for mobile data trading

DENT Token sale starts 12 July 2017 at 2PM London Time (GMT+1).

Go to https://www.dentcoin.com for more information.

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