



Opalesque Cryptocurrency & Blockchain Roundtable

GULF

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Editor's Note

With the strategic vision to 'put Dubai 10 years ahead of the rest', the emirate aims to run 50% of government services on the blockchain by 2020. The UAE Central Bank and the Saudi Central Bank have recently agreed to pilot a cryptocurrency for cross-border payments. This is pretty significant and very positive for the region at a time where a lot of places compete to be the hotbed for crypto, FinTech and blockchain technologies. And indeed, entrepreneurs from Silicon Valley have already relocated to Dubai to be part of the revolution.

However, blockchain is just one segment of this **emerging tech theme** which insiders expect to grow to be the foundation of strategic and important fundamental infrastructure (think electricity grids, power plants, dams, aerospace, cyber defense). *Eventually, we may reach an inflection point where the true powers of AI, blockchain, IOT and potentially VR come together and provide seamless experiences and new business models that we probably haven't imagined before.*

The half-life of the Elliptic Curve Digital Signature Algorithm

However, we are also facing a major challenge. Not only is every single of the top 10 cryptocurrencies based on the same cryptography — ECDSA or Elliptic Curve Digital Signature Algorithm — but also all SSL certificates, secure web traffic, online banking, and so trillions in commerce depend on this technology right now. The US government has made the mandate to shift towards post-quantum cryptography following the NSA's public announcement of the threat that quantum computers pose to this specific and widespread class of cryptography.

The number of people that understand cryptography inside out is probably just 5,000 globally. And when it comes to **post-quantum cryptography** or PQC, which is the type of cryptography one which we will be going to be using, maybe just 200 people on the planet out of seven billion are able to work on solutions in that field. For them, the challenge and the potential rewards are huge.

The Opalesque Cryptocurrency & Blockchain Gulf Roundtable, sponsored by [WTS Global](#), took place in Dubai with:

1. H.E. Mr. Zulfiquar Z Ghadiyali, **CEO- Private office H.H. Sheikh Tahnoon Bin Saeed Bin Tahnoon Al Nahyan**
2. Saeed Hareb Al Darmaki, **Managing Director, Alphabit Digital Currency Fund**
3. Robert Welzel, **Partner, WTS Global**
4. Ahmed Al-Balaghi, **Co-Host of Encrypted Podcast | FTC Community Partner Dubai**
5. Mohammed Mahfoudh, **Founder & CEO, Deca4 Blockchain Advisory**
6. Zachary Cefaratti, **Founder & CEO, Dalma Capital**
7. Jason King, **Managing Partner, CGS Group**

The group also discussed:

- **Ready Player One:** Where and how Spielberg's movie has already come to life (page 7-8)
- Hundreds of millions of unutilized Zakat: Using blockchain to track charitable giving (page 8-9)
- Why you should look at the cloud if you want to understand blockchain (page 10-11)
- ICOs: Bringing liquidity to the realm of ideas. **When would a cryptocurrency deemed to be a security? What are cryptocurrency investors actually investing in? What is the (only) functionality of the Bitcoin token?** The promise of security tokens offerings (STOs) and digital security offerings (DSOs). From digital representation of securities to digital composition of securities (page 11-14)
- **Case study: When could or should businesses look at cryptocurrencies and/or tokens?** When do non-security crypto offerings, utility token or security token offerings actually make sense? (page 11-16)
- Why and how the private sector should get involved (page 18-19)
- **Examples of blockchain applications and success stories in the UAE** (page 20-22)

- As easy as a swipe: The path to simpler solutions and more user-friendly interfaces (page 25)

Enjoy!

Matthias Knab
Knab@Opalesque.com

Participant Profiles



(LEFT TO RIGHT):

Matthias Knab, Robert Welzel, Zachary Cefaratti, Saeed Hareb Al Darmaki
Mohammed Mahfoudh, Jason King, Ahmed Al-Balaghi, Zulfiquar Z Ghadiyali

Introduction

Zulfiqar Z Ghadiyali

Private Office of Sheikh Tahnoon Bin Saeed Bin Tahnoon Al Nahyan

Zulfiqar Ghadiyali, I am the CEO of the Private Office of Sheikh Tahnoon Bin Saeed Bin Tahnoon Al Nahyan, the grandson of Sheikh Tahnoon bin Mohammed Al Nahyan, who is the Ruler's Representative of the Al Ain Region of the Emirate of Abu Dhabi.

I am also managing director for the Tahnoon Al Nahyan Group. But the groups have different activities. The Tahnoon Group is majorly involved in joint ventures and projects that we actively participate and invest in. The Private Office majorly does projects without an active interest, but we can still be a gatekeeper or a door opener. We also have two representatives on the ground in Dubai who offer services based on the corporate sponsorship model. However, we aren't a passive sponsor with who you'd interact just once a year; we tend to be very active and we have a whole set of offerings for that matter.

So, one simply put, the two areas I am involved with is investments and with the Private Office it's about bilateral cooperation, so we are very broadly set up and involved with more than 85 different business sectors. We also work with various governments of the world, with foundations and with charities. People outside of our region may not be aware that that UAE is one of the largest contributors for the charities of the world. We work very closely with some of them and maintain relationships across the world.

Ahmed Al-Balaghi

Encrypted Podcast |
FTC Community Partner Dubai

My name is Ahmed Al-Balaghi, some of you know me through my podcast here called Encrypted which focuses solely on blockchain and crypto. It's basically a no hype podcast about what's really going on here in this region. And the idea is to have down-to-earth conversations about this subject to demystify blockchain and educate people about this topic and ultimately make the market aware of what's going on here with regards to regional blockchain implementation. Concurrently, I am consulting two companies. One is called Kambio which is an STO platform based out of London and the other is called Matic Network, a layer 2 scaling solution based in India and other than that, I also deal with China - Middle East relations as well.

Jason King

CGS group

My name is Jason King, I'm the managing partner at CGS group. We are active in four areas in the blockchain and the crypto space: Investing, trading, education, and advisory.

I have been involved in the blockchain and crypto space for the last eight years and am also a co-creator of a cryptocurrency called FLASH Coin. I moved to the UAE from San Francisco where I was based in the valley for the last couple of years. I moved here around six months ago, and one of the reasons for my move was that we see great potential here in UAE and the adoption of blockchain. We see a clear potential for the UAE to become one of the most important financial hubs that's powered by blockchain and crypto in the near future and we want to be part of that and help the space.

Mohammed Mahfoudh

Deca4 Blockchain Advisory

I'm Mohammed Mahfoudh, CEO and founder of a company called Deca4. It's specialized advisory in the blockchain and STOs. We work mostly with government and big family businesses. I myself was very involved with angel investments mostly in Europe, and currently, I am acting as a mentor and advisor to a few companies. My main work is working with governments and setting up policies on things like blockchain or AI, especially in this region, but we also do some work in Africa and Latin America.

Zachary Cefaratti
Dalma Capital

Zachary Cefaratti, I'm the CEO and founder of Dalma Capital Management Limited. We are a fund accelerator with a focus on alternative investment funds.

Our pedigree is hedge funds, but we consider ourselves an "edge fund" accelerator as we are asset class, geography, and liquidity agnostic – but focus on strategies where there is an "edge" and a proven ability to achieve and deliver alpha. For example, through our fund acceleration platform, we made our first venture in the crypto space three years ago with the Alhabit Fund, which we accelerated in our ecosystem.

That gave us a view of how we could institutionalize a space which at the time still was in its nascency, by focusing on integrating it within a traditional financial services business. In that process, we learned a lot about space and decided that it was an area where we wanted to specialize – as we saw many inefficiencies and opportunities in the market. Right now, we are managing six different crypto strategies and products, including Alhabit, and also are applying the technology behind crypto-currency in our investment banking and securities business, where our capital markets division is focusing on applying the innovations in value transfer applied to Bitcoin and Cryptocurrencies to other asset classes such as Real Estate, Hedge Funds, and other private placements.

Robert Welzel
WTS Global

My name is Robert Welzel. I am a tax partner at WTS Global in Frankfurt with a consulting focus on international tax and regulatory issues. WTS was founded in 2000 in Germany as an independent tax consultancy triggered by the intention of the tax department of Siemens and WTS developed rapidly. At present, our headcount in Germany is approx. 1.000, and the international tax network of WTS Global worldwide exceeds already 3,000 consultants.

My personal focus is financial services, and this describes the reason why I am highly interested in Blockchain Technology (DLT). The blockchain technology has a specific logistical appeal for reform in the tax servicing and compliance arena.

DLT will likely continue to transform the financial services sector and especially the asset management industry. The financial institutions that find ways to adopt and apply blockchain technology will gain competitive advantages to delivering solutions with a faster time-to-market at reduced costs.

E.g., the asset management industry landscape as such is first characterized by a high level of intermediation and a broad range of diverse market participants. Second, the asset management industry is fraught with a plethora of tax rules. Therefore, tax processing can be awkward. Blockchain enabled smart contracts or even new forms of ecosystems may drastically simplify and streamline the entire tax servicing process for all involved parties.

I would like to mention our growing international network WTS Global. My international colleagues and I are eager to learn and participate in the development of blockchain and related technologies here in Dubai and the Gulf region.

Saeed Hareb Al Darmaki
Alhabit Digital Currency Fund

My name is Saeed Hareb Al Darmaki, I'm Managing Director of Alhabit crypto fund. I come from a traditional investment background where I worked for Abu Dhabi Investment Authority for nine years and I left June last year to focus on the blockchain and cryptocurrency space. I also advise a lot of blockchain and cryptocurrencies start-up companies and most recently, I joined the advisory board for the MENA Fintech Association.

I have been involved in a wide range of things in the crypto and blockchain space, trading, OTC deals, advising, really anything apart from developing or coding because that's not my background or expertise, however, I am very excited about the future of the technology. I think there's still a long way to go for it to be widely adopted but I think the potential is there and I see a lot of applications for it in the short to long-term future.

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Matthias Knab

Zulfiquar, you mentioned the 85 sectors that you are active or invested in – I was wondering, have actually invested in blockchain, FinTech or crypto or seen some interesting things there?

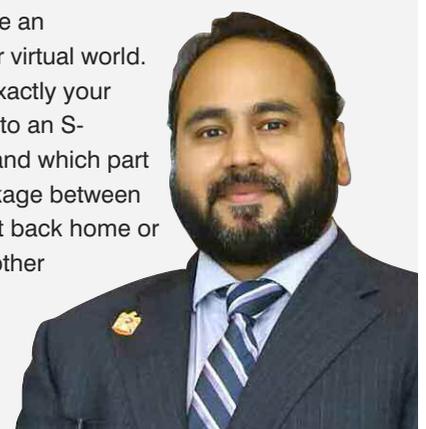
Zulfiquar Z Ghadiyali: Let me add that when I say 85 sectors that's also a result of us doing this for over 13 years now, but so far we never came out of the shell as such and only recently have taken a measured approach to talk about what we do. Of course, it is a bit surprising for people when I say we are active in 85 sectors, but the reality is that we haven't really been out there soliciting business but these things developed over time – people came to us and if we liked someone and both sides found that there's a good match, we ended up doing business together. Sometimes we remain a passive sponsor, and sometimes we become an active partner where we even put in our money as well.

Now, if I have to give you a pie diagram of my activity, it is almost 70% in defense and aerospace where a lot of things are highly classified and about which I am not able to talk, but the things I am able to talk about include unmanned aerial vehicles and unmanned road vehicles which can help to protect borders and other security purposes, for example. We also developed certain technologies on our own in AI and AR (augmented reality). I presented the technology last month at the Forbes event and I got a standing ovation for two minutes, which if anybody is interested, I can share it as well.

It's true that over the past two, three or four years, we have been approached by a lot of technologies and have become gradually active and interested in cryptocurrencies and blockchain as well. My education started with the CEO of Tata Consultancy Service who took me through what they have been doing in the space of blockchain and overall advisory on IT and future tech, which is how they call this sector. So, over a period of time, we learned and educated ourselves, and at the moment I would say we have a combined exposure of \$45m to the crypto business at the moment. But let me also give you more background about how we got involved, because I believe it's an interesting story.

One of our businesses is heavily AI-related, basically as a defense application which was built in 2000. At that time, the American army had to go to the war-zone but none of the American troops wanted to go into the Afghanistan war. So, we developed a platform where you can actually create your own avatar and move and act as that avatar in any part of the planet or a zone or a particular climate. You could act and do things exactly what people are doing there in real time. So, we created avatars of these soldiers who could actually go and have real-time simulated war-zone experiences which were modeled on the actual environment and warfare details of Afghanistan. Having gone through a number of experiences like that, the soldiers were much more comfortable and confident to be stationed there because they learned on the combat in quasi real-life situations.

We are now bringing that technology into the civilian application where we are giving people an opportunity to create an artificial avatar of themselves and they can go shopping in a real or virtual world. So, you could go to a Louis Vuitton showroom, they know exactly who you are and know exactly your last 10 years of shopping history with all the brands, and then also, because it's connected to an S-Health or your iPhone health application, it will exactly know how much weight you put on and which part of the body, and it will exactly tell you what you should buy and in which size. Given the linkage between your actual body and the avatar, whatever you wear and buy as an avatar, when you bring it back home or when it gets delivered, it would actually fit you. And, of course, that avatar can do multiple other things, you can go and watch movies, can go take a stroll in the park, can go and watch opera.



Zulfiqar Z Ghadiyali: Exactly. So, we did all of that development and then we realized people will need to pay, and that's where the idea of a crypto-based currency came into the picture. We are currently still talking to some players and are yet to finalize which one we will be going to go for.

This virtual reality technology has huge potentials and could potentially disrupt a number of businesses, not only on the app business side but also on the media side where we are going head to head with Netflix which so far has been the major disruptor in media but we are fast killing their business, and they already mentioned that in their annual reports. Samsung is our partner as are Lionsgate, Warner Music, Warner Bros. – basically all the top media and entertainment related-business or awards or festivals you can think of – 90% of them have tied up with us. The idea is to become the **number one media company in the world** with Lionsgate and all these kind of partnerships that we have.

But the technology also has some real-life repercussions. Last year in the US alone there was \$50 billion worth of returns. Sometimes you buy something that then you want to return, which results in a loss for the company, but they will still accept your returns because they don't want to lose you as a customer. With our technology, we will be able to avoid a lot of that wastage. So, in this business, we will eventually also have some exposure to crypto.

There's another field where we are looking to apply blockchain technology – in charity. In certain countries such as India, Malaysia or Indonesia, you can find that there are billions of dollars left in **unutilized Zakat**. Zakat, just for our non-Muslim friends, is a charitable obligation that Muslims have to give – 2.5% of their overall earning in a year. So there are billions of dollars in Zakat funds, and when you ask the authorities who handle these kinds of things in certain countries, they will say that the moment they move some of those funds into anything, there will be a charge of corruption against them, and so the money might just sit there, doing nothing, because nobody wants to run the risk to be accused of being the corrupt guy within the community, and so nobody touches these funds.



A while ago a gentleman who came up to me and said, "I have this wonderful idea, and I want your support and investment, not just investment but connections with all the Zakat funds." And he asked me to reach out to the different authorities within that domain who could help introduce the blockchain technology as a solution to this problem.

And indeed it's a beautiful, app-based solution where a donor can see in real time how the Zakat was used, like \$1 was used by Hamid in Ethiopia to buy rice for a family, \$5 were used by Khaled in Bangladesh to buy t-shirts for his kids, so you can get a complete break-up in real time of every dollar. So, I see blockchain as an exciting space overall and these are some of the things I am involved with in my very nascent, initial stage. And I am ready to learn more and do more in this space because I know this is the future.

Ahmed Al-Balaghi:

This is a fascinating and worthwhile application of the blockchain in charity. I was wondering, how are you dealing with the identity, particularly in developing countries? How would you know this is Khaled from this country?

Zulfiquar Z Ghadiyali:

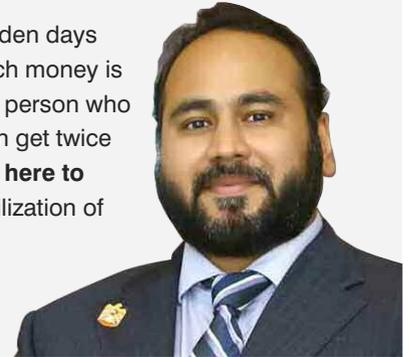
This is a good question. What's happening is that various charitable organizations are listed on the platform, and then you have to choose which one you want to donate to. Then each organization has its own database of recipients through which you exactly get the complete picture.

And right, are there checks and balances on this? I think they are still working on it, it's an evolving process but eventually, the transparency and accountability will be there.

Ahmed Al-Balaghi:

As we know, identity is one of the biggest challenges in finance and financial services generally.

Zulfiquar Z Ghadiyali: Right, but certainly I would think that we are moving away from the olden days where we used to give to charities and maybe got a letter from the charity saying that so much money is going to this or that and then after one month we got the same letter again naming the same person who got the money for the same cancer treatment, and you were left wondering how can a person get twice treated for the same cancer treatment? So I think that it's a good idea to **use the blockchain here to better track your charitable giving**. I would think that over time the corruption and under-utilization of charitable funds can get considerably scaled back.



Matthias Knab

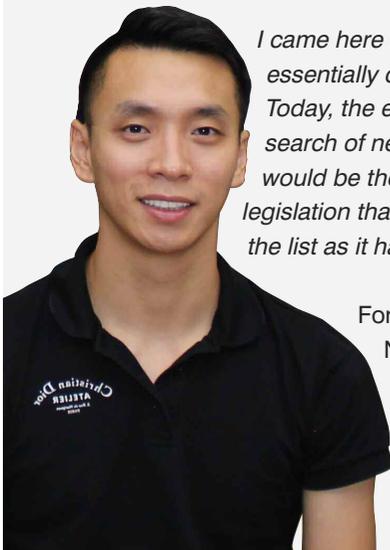
Jason, I found your intro also interesting. Can you give us more insights about why did you move here? What did you find here and what exactly is the opportunity or the promise you saw coming from Silicon Valley to Dubai?

Jason King: If you look at the world right now, we are seeing various places such as Singapore, Switzerland with the Crypto Valley, Gibraltar, even Cayman, so many places and jurisdictions in the world which are very proactively adopting or creating legislation or a regulatory framework, effectively putting in place a healthy incubating environment for this future technology and this future industry.

I came here from Silicon Valley, and it's interesting to notice that before the valley was created, it was essentially desert. And over time, a massive physical and intellectual infrastructure was created there. Today, the entrepreneurs are coming from the East coast to the West, not just for the gold rush but also in search of new opportunities. Looking further around the world right now, people like me are asking where would be the location to develop a new, specialized physical infrastructure with a government and legislation that is proactively adopting and pushing blockchain and crypto? I think the UAE will be on top of the list as it has massive physical land to develop.

For the past few years, we sort of developed in the early days cryptocurrencies underground. Now the sector is growing as it will become more institutionalized over time. Institutions, governments, banks are all paying interest and attention. The entrepreneurs are creating applications, everyone is trying to take their part in creating something.

The way I look at blockchain personally is that with the kind of data and solutions that



blockchain infrastructure is going to facilitate over the next 10 years, I believe that we have to look at these things more like in terms of very **mission-critical infrastructures** such as electricity grids, power plants, dams, aerospace, cyber defense.

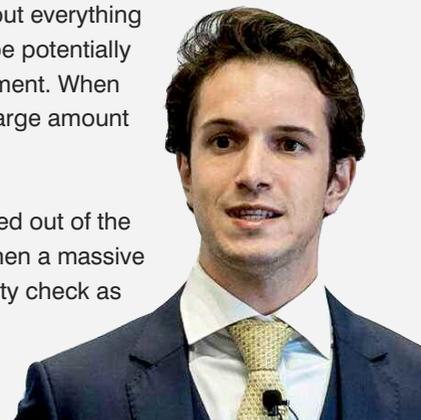
I see crypto-technologies and blockchain continue to evolve very quickly as we see superpowers in global nations rapidly adopting these technologies and sovereigns may begin issuing their national currency in a digital format. My point here is that we will see this industry grow into a very strategic and important fundamental infrastructure rather than just saying this is just for some start-ups trying to build the next Snapchat or the next Instagram. This is the way I look at the industry now over the next 5, 10 years. Certainly, over the next 30 years, we can only speculate about the amount of information we will have in a blockchain infrastructure or some new evolved form of database.

The comparison I want to make here is to cloud computing. Back then when it was first introduced, no one really understood why cloud computing should or could become huge. But today, it powers the majority of our infrastructure. I think we will see something similar around blockchains becoming such an integral aspect of business and infrastructure.

And, again, I believe that the UAE as it continues to focus and embrace technology and with these resources available here, you are seeing that many prominent, talent people, companies, and organizations are beginning to show interest as they see the Middle East as a huge opportunity, and that's part of the reasons why I moved here. I was actually here about two years ago. Actually, first I joined Alphabit Funds, so that was the first time I got to engage with the Middle East and really learned about this place. It's really an awesome place to live.

Zachary Cefaratti: There is maybe another interesting parallel between cloud computing and cryptocurrencies such as Bitcoin or Ether. As you mentioned, cloud computing was not part of the public awareness but this changed and subsequently, the space went through a very large wave of investment and excitement about everything moving to the cloud. This caused a small bubble, as many companies then turned out to be potentially ahead their time as the technology and infrastructure could not scale at the pace of investment. When this bubble burst, the cloud didn't die – but, over time, as we have seen, ultimately a very large amount of services moved to the cloud; with some ups and downs, the promise had materialized.

Would you think that crypto may have been or maybe is following a similar path? It remained out of the public consciousness for so long, suddenly became the center of the public awareness when a massive investment and valuation surge happened? But then, it also had to go through a bit of reality check as well?



Jason King: Absolutely. If we look at the last 18 months we basically experienced one of the greatest bubbles in human history. I remember when I first met Saeed in Puerto Rico, the entire cryptocurrency market capitalization was just below of 18 billion and over the course of the next 18 months, it blew well over 800 billion dollars.

But, I think we also need to look beyond the simple Bitcoin valuation story – I actually view cryptocurrency and blockchain as the toolset, and what's more relevant is what people do with the toolsets. Initially, people focused on what I would describe as the lowest hanging fruit, which was using this new technology to disrupt how previously investments were done. Traditionally, some young entrepreneurs got their idea, bootstrapping their concept and hoping it gets the VCs interested to put some

money into them and take them further down the line. Eventually, when they get big enough they would then talk to the big boys in New York who then can take them into an IPO and the public market.

That entire investment process from an idea concept to IPO and the public market takes well over a decade. Now, how many 10 years do you have in an entrepreneur's life? So, we go through years of iterations of entrepreneurs burning through an idea. But that's just one aspect, the other one relates to the wealth creation. Unless you're Mark Zuckerberg, Larry Page or one of these lucky guys you came to realize substantial value for their concept and idea and ability to form a business, a lot of the value of the future concept is typically absorbed by VCs and other types of investors alike.

*But now, with the ICO concept entrepreneurs can write a white paper about a concept and instantly validate the idea and get a market value for it without even building anything. That before was never heard of and you can well view it as borderline insane, but the world or say the people within that domain saw or understood the new paradigm and were willing to inject liquidity into an idea. If you like, **the concept of liquidity was introduced to the realm of ideas**, which I think is amazing. Of course, that then also gets abused with everyone throwing out ideas out there and we are seeing great ideas, bad ideas, and terrible ideas that should never be funded.*

Therefore, also this market has to go through a great correction, but what it also demonstrates now is how this toolset can be used properly, and so, it's about how we utilize the toolset. Similar to cloud computing or any of these new hypes or buzzing hot topics, the key thing is going back to the fundamentals of looking at what is value, what are investors and users really looking for and what are the best ways we can bring about value to the things that we are chasing after.



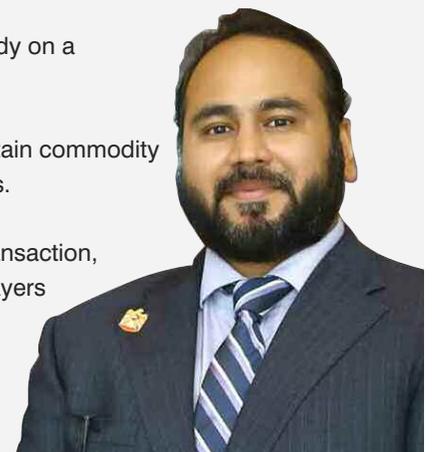
Speculation as such is as old as the hills, and so we have to accept that there will always be speculators, that's never going away. You are right, Zachary, we saw speculation in cloud computing, the dot.com bubble or much earlier with the Dutch tulip bubble, so a hype can happen at any time, however with blockchain as with cloud computing it's also clear that they are something real and not just hype and fiction.

You will also have seen the news that Facebook announced that they are going to create a cryptocurrency. Some are now saying that this would be bad for Bitcoin while I think that this doesn't need to be negative. Facebook's cryptocurrency or any other company creating massive cryptocurrency systems, those will be utilized for payments within their eco-system while the idea or the concept that Bitcoin brings about is really the underlying basis of this entire industry with its various applications. So, I think Facebook just validates the idea of what Bitcoin brings about to the world, and that is actually a good, positive thing and demonstrates that underneath all these bubbles there is something real developing which we all should try to understand.

Zulfiqar Z Ghadiyali: I have a question for you which could be something like a case study on a potential real business use case for cryptocurrencies.

We have just signed an agreement where we will be shipping 5 million metric tons of a certain commodity for the next 20 years to a specific country, which values the deal at around 60 billion dollars.

Somebody told us that we could go and create a crypto platform to finance parts of this transaction, rather than raising money via public markets because this could make the deal and the players involved more immune against hostile takeovers or any maneuvers from the competition. What are your thoughts here, would you agree to the suggestion to use a crypto platform? Would that be possible, and how do you do that?



Zachary Cefaratti: I think it's very important to consider the differences between what we typically characterize as cryptocurrencies and what might be deemed to be a security. As soon as there is an organization offering rights to unit-holders, in most jurisdictions that will be deemed to be a security and fall under securities regulations which will dictate who can invest, what kind of reporting requirements the issuer is subjected to, what kind of filings need to be made and how that might be traded, if at all, on a secondary market.

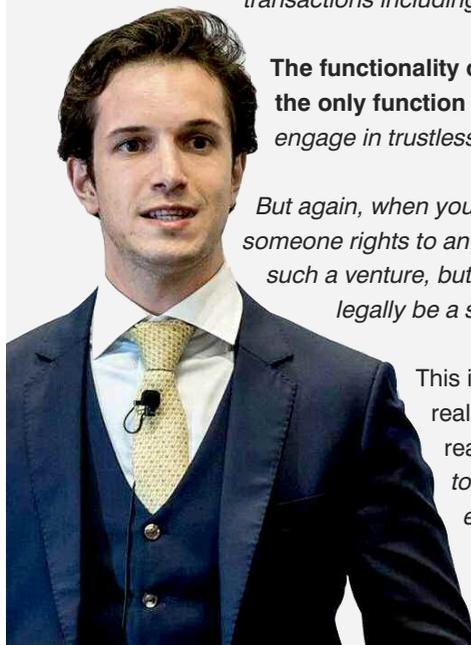
So, when you are looking at projects as described, typically you want to give investors in that project some benefit from the success of the project which would be documented in the rights that they are given as a unit-holder. This can be prohibitive or challenging to offering a true cryptocurrency (ie utility token, payment token or community token).

One important aspect here is that most cryptocurrency exchanges are not licensed to trade instruments which are deemed to be securities. Cryptocurrency exchanges typically rely on the fact that they are not trading securities, so they typically operate under a money transmitters license or something equivalent. On that exemption, they are able to trade instruments that do not give rights to unit-holders such as Bitcoin, Ethereum, or XRP. This then also means that if you want to launch a cryptocurrency and to trade that on cryptocurrency exchanges and give investors benefits of that potential liquidity, you usually end up having to give up all of the benefits/rights of their investment in a typical project.

So, **what are these cryptocurrency investors then investing in?** They would be typically investing in a piece of a network. You can create your own cryptocurrency network right now and your coins could be in every way identical to Bitcoin but they would also have zero value because you are not part of the global Bitcoin network, because the value is in the ability to utilize that network. The key point here is that cryptocurrencies such as Bitcoin, Ethereum don't give any rights for voting, they don't give rights to income or to any other benefit besides the functionality of the token, which allows a holder to append the blockchain and network underpinning it.

Blockchain refers to a combination of digital technologies designed to allow participants in a decentralized network to read, maintain and update a distributed ledger that is uniform and immutable. Uniformity is ensured by the implementation of a consensus mechanism whereby copies of the ledger are cross-validated between duly incentivized participants for consistency. Immutability is ensured by structuring newly validated data into blocks that are bound via a cryptographic hash to existing data blocks such that alteration of historical data would cause the entire set to be invalidated and rejected via the consensus mechanism.

Whilst private blockchain applications exist and have numerous use cases, public attention and investment are generally focused on public permissionless blockchains, such as Bitcoin, due largely to their capability to enable trustless peer-to-peer transactions including the transfer of value and the validation of data or logic.



The functionality of the token of Bitcoin is the ability to transfer it from one wallet to another. That's the only function it has, the ability to append a permissionless public database, *but that ability to engage in trustless, permissionless, digital value transfer is what makes it so compelling.*

But again, when you are looking at projects, companies, real estate, anything where you want to give someone rights to an income stream or asset, crypto can be a very interesting approach to capitalizing such a venture, but you have to then basically take cryptos as a technology for the backend of what will legally be a securities offering in whichever jurisdiction you may go.

This is an area we are very interested in as we believe that by 2020 we should see some real advancement in this crypto securities space with offerings in diverse assets such as real-estate projects or private companies where the *ownership is expressed by owning a token, which is recorded and transacted on a decentralized digital ledger. This empowers the owner to transact and custodize their asset without intermediation.*

Another important aspect that historically has been holding back crypto securities is a **lack of a secondary market and lack of liquidity**. If you show your crypto product to a typical cryptocurrency exchange, one of the first things they will check is the risk that it could be deemed a security. If that risk is high, then they won't list it because they would be basically violating or acting outside of their own license by intermediating trading of a security.

Now, in last the few months and also looking ahead we are seeing a lot of regulated crypto exchanges and traditional exchanges opening up their markets specifically for crypto securities, security tokens offerings (STOs), or digital security offerings (DSOs). The idea is to use this innovation or technology of value transfer with little or no intermediation as well as the benefits of smart contracts applied securities offerings; then, hopefully, these securities offerings are actually going to trade actively on a secondary market.

Although a few offerings have already been completed, the health and the liquidity of the secondary market remain to be seen. Again, the caveat when it comes to a lot of the existing licensed security token "exchanges" is that they are a marketplace, but not really exchanges because they can't route orders or run a matching engine. As soon as you start routing orders, meaning that you are matching a buyer and seller with a matching engine, that will be a true exchange, and we are starting to see those come online quite soon such as tZERO.

Many skeptics are concerned that the technology is too esoteric and will never become mainstream as investors will never understand blockchain – we actually disagree with this. Most investors in the stock market do not truly understand the mechanics of how the stock market works, most internet users have no clue how the internet works. What they do understand is that it does work, and they mostly get the results they expect. Crypto will be the same way in the future, it will just work.

For your case, Zulfiquar, you could consider a bond offering which then, of course, would also fall under existing regulations, potentially giving you the protection you are looking for.

We need to keep in mind that digital securities are new, and on our side, at least for now, we like to apply them only to investments that are relatively easy to value and understand. If, for example, you have a startup company, it's very difficult for the market to determine what your valuation really is. So, if you add the complexity of crypto now to the complexity of valuing a Series A-stage tech startup, using digital security is probably isn't the best approach. Further, I don't see a healthy secondary market for an asset that's very difficult to value and that doesn't have necessarily the transparency of an investor would need for a public offering.

Jason King: *What I'd like to add here is when we look at security token offerings versus cryptocurrencies, it's not necessarily about one is better than the other, I think they are complimentary. However, even if we create a crypto or a STO and back it with some assets, in the event of a legislative event or conflict of interest, you still need to go through the standard court of law. You then need to look at questions such as, are smart contracts recognized, where and how can you enforce rights, how do you enforce investor protection – these are some of the questions that are not yet answered by the market.*

People still have questions as to what they actually own if they hold Bitcoin or one of the decentralized cryptocurrencies? Well, as we said, it's a new concept of ownership where every Bitcoin holder theoretically, not technically, sort of owns a piece of the network. Let's say you own 1% of the Bitcoin network, you will still own 1% no matter if the Bitcoin market cap is \$1 million dollars or \$10 billion dollars. Your Bitcoins don't represent an equity share in something, and also won't give you dividends. Instead, you are owning or joining or becoming part of the network.

Let's look at the case where an existing, say a traditional, large company like Apple does a



STO. Of course, there's HP, IBM, and other computer makers, but Apple dominates the market so much that like Facebook they could well be issuing a cryptocurrency. They would have the network effect and the distribution to potentially clamp the market down. So, here you have a very strong business with a sort of monopoly, which by the way is also how sovereigns can create and print their own money. Why does each sovereign want to create its own money? Because money creation is very real power.

And, by the way, Apple does create their own money in the form of gift cards, but they are not like cash. Coming back to Zulfiquar's question, a cryptocurrency is like US dollar and STOs are more like Apple shares, they have their pros and cons, but with both, you can definitely reach a very large market. When you have locked in high demand or a quasi-monopoly on a certain commodity, you can essentially create your own cryptocurrency based on this and anybody who is looking to tap into your ecosystem then would need to use your cryptocurrency or issue an STO, both could work.

Robert Welzel: With tokenization, new digital asset classes will emerge, and **many current relevant intermediaries might lose their business models in the future.** This is especially of relevance for the asset management industry. Different ecosystems will emerge and DLT has the potential to disrupt and alter the core value proposition of these businesses. This is really a multifaceted issue with many different layers that need to be watched.



It may be interesting to add that a German company has won the race to issue a fully regulated security token, at least in Europe. Insiders are saying that the Bitbond issuance is a radical shift in the STO narrative so far. From a pure regulatory perspective, it is a bond, however reflecting the tokenization of asset classes. This needs to be analyzed on the basis of the current law and regulatory concepts, and that raises a lot of new and diverse questions to be answered.

Ahmed Al-Balaghi: I think we also need to understand that in traditional finance and asset management, the status quo, for now, is that we have a digital representation of securities. We can trade electronically via a computer or a phone, you log in and trade, however in the back end, everything is still sort of manual with settlement periods of T+3 or so. But then when you put in blockchain to process and transfer, the idea is that these shares are then represented in a token format. And then, adding features like smart contracts can make the whole process seem seamless.

But, as we mentioned, in this case, we are dealing with a security. It's not like a crypto network like Bitcoin which has its own governance and its own rules, but with digital assets you're just basically doing the same old thing that you're doing now, you're just using innovative technology.

With regards to regulation, in London, the FCA has already approved regulated securities to be registered on public blockchains, in this case only Ethereum is approved. This is a huge milestone. Big evidence of this is from the London Stock Exchange which recently led a \$20 million round in a start-up that basically does what I mentioned earlier. We are thus going **from digital representation of securities to a digital composition of securities** which is in token format and is being cleared and settled on the blockchain with regulatory oversight. This is huge.



Saeed Hareb Al Darmaki: One thing to keep in mind is that just because you are using blockchain, it doesn't mean that the value of the underlying asset that you are trying to digitize will change. The underlying value of the asset is going to be the same. The question that you need to ask is *if you do a token offering for the bond or issue a bond on blockchain, is that going to make it more attractive for investors?*

Another thing to consider is that if you use blockchain or if you do a token offering, that's not going to eliminate the threat of somebody taking over your business or the corporate governance of the business.



In my mind, the key consideration would be if a STO in the form of a bond, for example, will be more attractive to investors? If the answer to your question is yes, then you could consider it but also, as we said, the security token market, in general, is still very early stage. The infrastructure is still yet to be built, the liquidity of the secondary exchanges like Zach mentioned probably isn't at a level where it competes with current public exchanges or secondary exchanges for securities. However, it will get to that point – it's just a matter of time, it's not a matter of if. At the moment, it's not as liquid as people say, and there's a lot of hype.

Zachary Cefaratti: As much as I am an advocate for crypto, I would actually disagree that any form of crypto offering is the right approach for what you are looking to achieve.

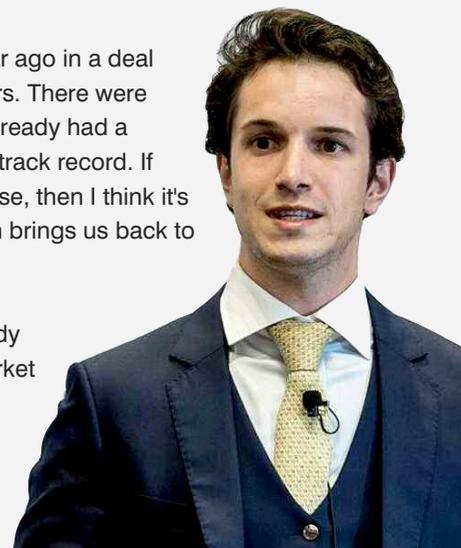
The first thing we ask anyone with a crypto proposal is why? Why are they opting for a crypto project; Zulfiquar gave a good explanation of the why, and in this particular case I don't think the why is matching with the how, the what and the who. How will your token work? What will it do? Who will ultimately own your tokens and why would they participate in your network?

For a non-security kind of crypto offering, you need to have a strong network. You need people that are going to interact with this crypto economy that you want to create. I wouldn't recommend to try manufacturing a crypto economy because you may think you have a monopoly on a particular asset – I don't think this is the right approach.

A lot of people come to us with the idea of just attaching a crypto to a particular existing business, but it doesn't really need that additional layer of complexity in order to raise money. At the same time, they are trying to maneuver in every way in order to avoid being deemed a securities offering or give investors any rights. Without a strong, compelling network which actually is going to create transactions and add value to the ecosystem, it's going to be challenging to justify a non-security crypto offering.

The last major investment we made in a true "cryptocurrency" as such was about a year ago in a deal sponsored by a company called Telegram, in which we invested about 10 million dollars. There were several factors playing a role in our decision, the most important factor was that they already had a network of some three hundred million users. Besides this, the team has an incredible track record. If you don't have that network or the potential to build one on your own that people will use, then I think it's difficult to create a token that can generate value from a network, and this exact reason brings us back to why many investments fit better into the framework of Security Tokens.

Even then, you need to answer why a security token? If you have an asset that is already complex and it sounds like it's quite a large offering, I don't think the security token market is ready for that. We would, on a deal like this, generally advise working with the large sophisticated investor who is willing to take a passive position and understands the investment thesis behind the project.



There are plenty of investors, there is plenty of private capital out there looking for high-quality deals and have the ability to really understand your thesis much better than the public markets or a broad base of crypto investors. So, as much as I love crypto and would love to see more things happening on blockchain networks, I don't think the market is ready for an offering like this.

Robert Welzel:

At a first step, standard legal structuring might be the adequate procedure to optimize and safeguard this interesting project. The tokenization of the assets might add additional financing opportunities in the near future, too...

Saeed Hareb Al Darmaki: If you want to create a token which has utility, which you are going to sell as utility token, that then needs a network and needs people to actually want to buy and use the token in some way or another. You need to generate demand for the token. If you are going to offer a security token, you don't need to have a network or utility for that token because it's just the token that's backed by your security.



I agree with Zach's comment that it's probably a bit premature aiming to raise large amounts of capital through STOs – it's not the right time now to do that because the market is still in its early stages and available capital and liquidity are limited. It's probably a good idea to look for large investors, but I also think there are benefits to using blockchain for such a potential security offering and you should definitely study that. Certainly, it's primarily about approaching the right type of investors that would actually buy into it. There are a lot of complexities here, and of course, you also have to look at the legal side of things.

Jason King: While we have to accept the present limitations, we also shouldn't forget how the world can fundamentally change in very short periods through technology.

When we look at cryptocurrencies now, I think in the future this will not be anywhere close to what we think it is now. Take a look at the internet today and how it drives everything from infrastructure, shopping, commerce, traffic or business, and compare that to the reality in the 90s. How many businesses had a website back in the 90s? Not many, and the functionality was extremely limited as well.

Then, just as another example, we saw the advent of social media. When that came up, how many businesses began thinking we need to add social media presence? And how many decided to get entrepreneurial in that space? I think it is fair to say that from a technological, foundational perspective, cryptocurrencies and digital assets are a proven concept, and many things can and probably will develop when we extrapolate the momentum of innovation and human creativity into the future.



Matthias Knab

Mohammed, you said in your introduction that you work as an advisor to families and governments. Can you share with us what you see in those two domains, families and governments when it comes to blockchain, FinTech, and cryptocurrencies?

Mohammed Mahfoudh: Sure! While I work on a spectrum of things, the main theme is to try to build a framework for entrepreneurship, and here I work with the governments in different ways.

As we know, entrepreneurs are facing many challenges where funding and getting angel investments is one of the key challenges. Access to funding for early-stage is one of the major obstacles here and so far the full reliance is on governments to boost that. We believe that a solution to the early-stage funding is the usage of security tokens on the blockchain. The security tokens, or STOs, or digital assets, can provide access to funding from the general population in a crowd-funding manner. The usage of blockchain makes it easier to have a bigger number of investors with small investment tickets, which we believe that in a few years will become the standard method of funding for big and small projects.

Currently, we are advising certain governments here and in Africa on the usage and benefits of blockchain to tap into the wealth of the masses. We believe the security tokens and other use cases of blockchain is ideal for these places to give them a jump start to be positioned in relative terms closer to the current global markets. As finding proper financing in many places especially Africa is a challenge, we are working with certain governments on developing an ecosystem for usage of security tokens to tap into the wealth available within their own population.

It's not early to look into it and get educated about it. So we have an advisory unit where we help senior officials and governments to understand the landscape.

In order to develop a working digital asset infrastructure and ecosystem, many components need to be in place including the adoption of the governments. But while a government may be really pushing for that, there are still so many gaps and tasks left where the private sector, entrepreneurs backed with private funding, need to step in and create solutions.

In developing these new technologies and ecosystems, I doubt that we should just focus on say copying Silicon Valley. I have worked in so many different countries, and my recommendation from that experience would be to identify and build on the specific strengths of each location and each jurisdiction.

I do fully agree with Jason that there are huge potentials with blockchain and security tokens. I also believe a place like the UAE and the region here has a real chance to disrupt the financial system and create a new mode of funding. But for that, the entrepreneurial side and the local startups must be fostered, and for that more private funding, capital and risk-taking is needed. The current ecosystem for startups has many challenges, from obtaining bank accounts and facilities to funding and finding talents, that can be addressed if more involvement from the private sector and partnering with governments to simplify that.

I strongly believe that you could create an opportunity to disrupt especially by utilizing technologies such as blockchain. If you look at the public blockchain, this is in effect a massive, distributed computer with a lot of computing power and storage. Research students, for example sitting in a university in UAE or elsewhere, can be using blockchain and to tap into computing power and into massive storage with minimal to no investment. These technologies allow places like here, or central Europe, Eastern Europe, Asia, Africa, to become a serious player in R&D and entrepreneurship at a global stage.



Governments also need to be aware that demographics and development of new technologies such as blockchain can also over the next five or ten years lead to geopolitical shifts where certain countries can potentially play a much more important role globally using these new technologies. But, again, my point here is that we don't only need a good PR for the adoption of new technology, we also need a bottom-up, well designed and supported ecosystem of entrepreneurship and funding.

Ahmed Al-Balaghi: Mohammed mentioned the need to educate banks on blockchain and the various challenges startups face in this sector, and what I have observed also from speaking to guests around the world in my podcast, this is more of a global challenge rather than a regional challenge. I mean, even in a place like Singapore which some view as the most advanced country for blockchain, I have seen startups complaining to the regulator on conference panels that they can't open bank accounts.

So, the challenges are diverse and complex, however, let me also add that people from various government departments that we have interviewed and had on the show displayed a good level of sophistication in their understanding of deploying blockchain. The reality is that everyone is in a build phase now, and we will see more results and potentially solutions, and standards coming out of these different experiments.

We also talk a lot to Smart Dubai about these different things and they have multiple projects going along within these different various government departments because if you have one blockchain use case in the government, you have to actually bring in three or four different government departments together and that takes time. I know all these government departments aren't always aligned from the outset, and so Smart Dubai has to come and bring them together. You see, so sometimes, at that higher level, things can be quite tricky and things are definitely happening, for example in the real estate division where they are trying to digitize the process of buying and renting real estate. But I definitely agree that for entrepreneurs and startups, it can be very difficult here and that there's a lot of room for improvement.



Mohammed Mahfoudh: I just have one comment if I didn't make myself clear. My point is that here in the region, I think the government is way advanced compared to the private sector. We also know that no innovation will happen without funding, and in a way, we are always waiting for the government to fund new ideas and projects, which they do. What we need to see is **more involvement from the private sector.**

What we are telling family businesses in promoting entrepreneurship here is to invest in early stage, and not to wait. There are funding gaps which also provide huge opportunities, and while the government is pushing very hard, we don't see much involvement from the local businesses and business people. For example, we know that our region is pushing for adoption of advanced technologies such as Blockchain. I wonder why local investors don't jump into this opportunity. It would make sense to invest into various businesses delivering advanced technologies such as blockchain, AI, and big data, which we know the regional governments are pushing for adopting it, creating a relatively lower risk for these investments.

In summary, the governments are more advanced and taking all the risk for early-stage investments, which is understandable; however, they also create huge opportunities and reduce the risk for private investors, whom we encourage to look into investing in sectors that might not be within their traditional investments but give them access to participate in the new world and the new economy.



Ahmed Al-Balaghi:

I agree, there is both opportunity and then also from the family businesses a need to participate and be part of these new economies, also to develop new income streams down the line.

I was wondering, from a cultural or educational perspective, what did you find actually works well in helping family businesses take that step and get engaged in a start-up environment? Can you share some success stories or recipes for that?

Mohammed Mahfoudh: As we are all aware, the powers and leaders in any sector or industry tend to move and rotate, so any business can be in a position where revenues and/or market share continues to drop, but then you cannot simply try to sit that out, doing nothing or waiting for the government. I already mentioned that the government here is already doing way more than what it needs to do in the early-stage investment part.

In certain parts of the world, and to an extent also here, you can find a sort of fear or apprehensiveness regarding startups, while other countries, for example, the UK, even offer tax benefits when you do angel funding. Here, we don't have that incentive, but early stage and higher risk projects need funding and need stimulation. So in our work, we focus on innovation and innovation strategy, bridging families and government, trying to create incentives to encourage investments in early-stage, high-risk, and high-growth ventures.

An example of such stimulation involves two family groups and a government entity to create a **joint accelerator program** where the private businesses would fund it, not the government, and the government contributes as an enabler.



Saeed Hareb Al Darmaki: I think this is an excellent approach as it also shows that in fact, it is possible to move the needle here from risk-averseness to risk-taking and funding future technologies.

If you look at what domestic investors have been mainly investing in, it's, of course, things like bonds and real estate because these are asset classes with some of the lowest amount of risk. Now, nobody is being asked to put everything into new ventures, but we need to continue this sort of education in order to diversify and enable future technologies. It's a lot of things such as education, ecosystem, infrastructure, regulation – many things need to fall in place for it to actually really take off here.



Ahmed Al-Balaghi: If you look around the globe, these are common themes with startups in general. We already talked about the need to differentiate between blockchain and crypto, and what adds this extra layer of complexity is when the applications have a financial link to them, then it becomes even more complex as then we are in the realm financial regulators such as the DFSA, Central Bank of UAE and ESCA in the UAE.

Saeed mentioned the need for regulation, and historically speaking, the UAE has been modeling regulations broadly speaking by following the UK. But in this new world of crypto and blockchain, it's clear that also the UK hasn't really finalized everything. Just from that perspective, I would doubt that the UAE would leapfrog everyone and go on their own with financial regulation for these digital assets and cryptocurrencies. In my mind, until London or New York have moved and implemented a full regulatory framework, we will only see bits and pieces from the other jurisdictions. Is this something the UAE can do to be competitive as a financial hub and release favorable regulations surrounding digital assets and crypto?



Mohammed Mahfoudh:

I agree, Ahmed, yes we have been following the UK and the US. But I think this is also **a chance to disrupt**. I do believe that in digital assets there is a chance for a country like UAE to say, "We'll take a leap ahead of everyone." Maybe I am too much dreaming here, but Dubai has already proven that these things are possible.

Zachary Cefaratti:

In my discussions with the private office of the ruling family of Dubai, my understanding has been that Dubai has a specific vision to be ten years ahead. So, that might hopefully pervade into financial services regulation. We are already seeing regulators in UAE take steps to put themselves 5-10 years ahead of other jurisdictions.

Matthias Knab

I was wondering, are there some success stories or projects you have seen here on the ground that you think stand out and the world should know about them?

Saeed Hareb Al Darmaki: There are several different things that are happening on the ground that are positive for blockchain here. The UAE Central Bank and the Saudi Central Bank have recently agreed to pilot a cryptocurrency that's going to be used for cross-border payments between them. This is pretty significant and very positive for the region. The project has started and it's probably going to be piloted over say six months or a year, as long as they need to feel confident that it works. Perhaps after they finish the pilot they say, "Okay, it has great benefits, so let's increase the use of it and spread it out on a wider scale next."

I also read about a government entity called Bee'ah where they recently signed an agreement with the Hamriyah Free Zone Authority about the use of blockchain on their waste permit approval



portal in the hope it will reduce the time that permits get approved and make it less costly as well.

Al Hilal Bank piloted a Sukuk bond using blockchain. Emirates NBD is using blockchain for its internal check clearing system. There are examples of blockchain being used here by major corporations in core business applications already but of course, I would like to see it used even more, particularly, as Mohammed was recommending, by the SME industry here as well.

Like Mohammed explained, the government is doing all they can and the central bank is showing that they want to test cryptocurrencies, but we also need the smaller players on the ground to actually adopt it as well so the technology and diverse application can develop further in the UAE.

Ahmed Al-Balaghi: An interesting dynamic I have seen here at work is how **startups are working with the large corporates they are trying to disrupt**. Saeed mentioned the Al Hilal Bank project, which is actually run by Jibrel Network which is working with Al Hilal Bank. I think this concept of banks actually working with these startups is a real big step moving forward, in particular as we're talking about the financial world and financial applications.

There is also Addenda which is an insurance blockchain startup as well. They're working with Takaful Emarat exploring a pilot project on how they could help insurance companies use blockchain and smart contracts to basically make premiums more affordable and more transparent. So in my mind, just this concept of giving startups a chance to work these corporates is already a big success story.



Saeed Hareb Al Darmaki: Allow me to add that I also serve as a strategic adviser to a local startup called DEX.ae which is trying to set up a regulated cryptocurrency exchange in the Abu Dhabi Global Market (ADGM). This is something that will also be very good for the UAE and the region as it gives local institutions and local traders the option to go from the local currencies like AED to crypto and back.

At the moment, there are unregulated options out there like BitOasis, but such unregulated entities can sometimes have issues with their withdrawals and banking. I know there are a couple of other local startups or existing businesses that want to get the license to trade cryptocurrencies, so that is a sector where new solutions will be coming up soon which is great for the UAE and the MENA region.



Robert Welzel:

We recognize that many big corporations, financial and non-financial institutions, are revisiting the business models in the view of DLT; e.g, how will the future combination of technologies like the IoT (Internet of Things) and DLT change existing business models. The question of future business models is of utmost relevance not only for startups but also for existing businesses. How to establish and/or maintain future value propositions is a key question.

Saeed Hareb Al Darmaki:

As mentioned, some of the local banks are starting to look into how they can adapt the technology, and the Dubai government is definitely proactive with getting their government services on blockchain as well. So, they lead the way, but certainly, as you said, more corporations and bigger companies should examine how they can use blockchain and other technologies, but this is, of course, something that needs to be built over time.

Mohammed Mahfoudh:

In fact, it is known to everyone that the governments here are adopting the technology faster than the private sector. By 2020, Dubai aims to run 50% of the government services on the blockchain and the UEA Federal Government is aiming to achieve that by 2021 or 2022.

Matthias Knab

Saeed, you mentioned in your introduction that recently a MENA FinTech Association has been formed. Can you tell us more about this association?

Saeed Hareb Al Darmaki: The **MENA Fintech Association** was set up around six months ago. I believe there are four board members including Nameer Khan who has been in FinTech and digital transformation specifically for a long time. There is also an advisory board which I recently joined, as well as several committees with each one looking at different aspects of FinTech in the MENA region. For example, one of the committees is blockchain and cryptocurrency, another one is WealthTech, there's a talent committee and for other different areas related to FinTech and the region.

The MENA FinTech Association is also working on and rolling out a number of initiatives throughout this year, and there are quarterly meetings where, as you can guess, a lot of things are being discussed and many initiatives are looked at. Another ongoing focus is of course education and creating awareness. We have also entered partnerships with a lot of local and regional companies so there will be a number of things coming out throughout this year related to financial technologies. Financial services is an industry that can be and has been disrupted by technology, and that's the reason why FinTech is very important and why I believe there will be a number of good things coming out from the association.



Ahmed Al-Balaghi: I agree that FinTech is, of course, relevant, as is blockchain, crypto or AI for that matter. But just stepping back for a moment and looking at the big picture, I think we also have to realize how the concept of digital economies is really going through a paradigm shift when it comes to the makeup and interaction of our online communities. Here we see human to human, human to machine, and increasingly machine to machine, right? *I believe that we will eventually reach an inflection point where we will experience the true powers of AI, blockchain, IOT and maybe VR as well as they come together and provide seamless experiences and new business models that we probably haven't imagined before.*



To me, blockchain is just one segment of this emerging tech theme, and with the concept of tokens and the ability to transact so freely regardless of the traditional barriers is what makes it so powerful for digital economies. It's just a question of time until people will jump on this, similarly to the adoption of the current internet, and realizing, "Hey, this is amazing!" And then the governments will probably have to adapt a couple of things as well. I think when we compare our existing digital economies – so things like AliPay, WeChat or PayPal – to the solutions of that digital future, I think the applications we will probably have will be like ten times bigger.

Jason King: When it comes to blockchain specifically, I agree that the extent of how this technology is going to be implemented across so many industries, I can't even begin to imagine the scope and the size of this industry over the next five years.

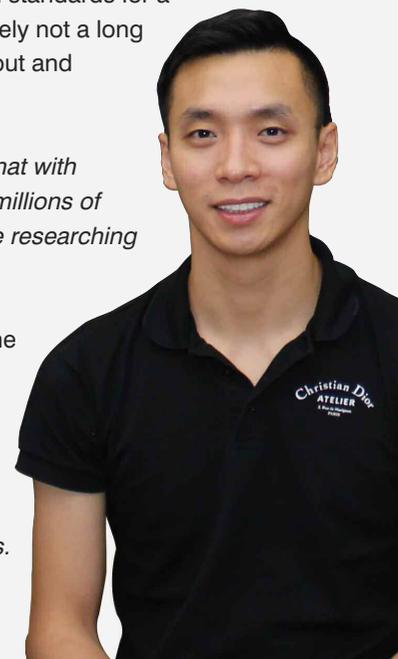
However, we are also facing a challenge. Already over the last two to three years, some of the top research scientists, including several government agencies, including the NSA, have warned that there are specific functions within all currently implemented blockchain technology that will be severely disrupted over the next decade, especially by the rapid advancement in quantum computing. What we have now has been proven over the last 20 to 30 years and theorized by scientists, however, we may be inflicting a major problem down the road.

Some people may say that 10 years is a long time, however, I believe this issue needs to be immediately addressed because this is **not just a cryptocurrency option, but all data security**. There so much valuable and vital data around the world and needs to be secure also long-term. In the light of this challenge to find new technologies and standards for a future proof long-term security of data is a fundamental issue, and for that ten years is definitely not a long time to consider given the extent of pavement or obsolete standards that we will have to rip out and replace with something else.

So, this is something that is real and that I would like to add to this discussion. *The thing is that with blockchain it's not like we're all just sitting on one big Titanic, we maybe having to deal with millions of Titanic sailing across the ocean and all heading towards the same iceberg, so we need to be researching and looking into that.*

Allow me to add a bit more color to this. I recently had a conversation about the viability or the future use of Bitcoin, and it seemed to me like someone who might have looked at the internet back then and said, "Oh, it's just a faster fax machine!" Okay, it is a faster fax machine but it has so much more additional functionality, and this is what counts.

At its core, the functionality of DLT technology and blockchain technology will not change – perhaps as we go along on the line, we will discover more capability and add more functions. But I need to be crystal clear that the issue I have been talking about is the very functionality



that gives crypto and blockchain its property of security and the very value promise of crypto. I mean, what is crypto? Crypto is cryptography. What is cryptography? It's applied mathematics. So, I am not arguing against the use case of blockchain or whether it's viable or not, but the piece that's in threat is the fundamental technology.

And to be really honest, when it comes to cryptography, the number of people that understand this stuff inside out are probably just 5,000 people on the planet. **Post-quantum cryptography** or PQC, which is the type of cryptography one which we will be going to be using, maybe 200 people on the planet out of seven billion are able to work in that field. So, this is such a crucial and important problem, and yet so few people who understand it at all, and we are not even talking about finding solutions to the issue.

Again, this to me is the fundamental challenge. I mean, forget Bitcoin, EOS, Ethereum, Litecoin – every single of the top 10 cryptocurrencies right now out there use the same cryptography, it's called ECDSA – **Elliptic Curve Digital Signature Algorithm**. **But that is not just used in cryptocurrencies, but also in your SSL certificates, your web traffic, and online banking**, so much of the word depends on it right now. The US government has made the mandate to shift towards post-quantum cryptography with the NSA announcing publicly already in 2015 the threat of quantum computers to this specific class of cryptography. So, I'm talking about something that is so much bigger than the entire Bitcoin industry as this affects trillions and trillions of dollars of data and commerce.

Ahmed Al-Balaghi:

Bitcoin basically let the genie out of the bottle, and in the future, we may see Bitcoin-powered by quantum computing or whatever it is going to be. I think the industry will come up with solutions that can prevail over time. And should Bitcoin die tomorrow, there will be something far more superior replacing it.

Matthias Knab

I tend to agree here. I am not a historian or a philosopher of science, but what comes to my mind *looking at history and the evolution of technology is that each subsequent evolutionary step or development of technology is able to conserve or maintain existing functionalities while at the same time enhancing and adding new ones.*

So I would think that any of the new functions that have been enabled with blockchain cryptocurrencies will be maintained if not expanded when the next disruption comes from quantum computing or whatever, then from that perspective, this isn't something that from a user perspective we need to worry about. Any functionality that the blockchain and the DLT have brought up would remain.

However, for developers and the 200 post-quantum cryptographers Jason has mentioned, the challenge and the potential rewards are huge.

Robert Welzel:

If the internet was about exchange of data, blockchain is about exchange or transfer of value. Please allow me another thought. We learned that the internet has been more or less monopolized by the usual suspects, what the founders and inventors of the technology probably have not anticipated. I wonder whether a similar risk might emerge that the transfer of value might be monopolized via DLT and then any further disruption might be getting even more difficult?

Mohammed Mahfoudh: The nature of the blockchain technology with distributed computing, distributed ledger, and open-source code will continue accelerating the movement of the technology. The development of the internet took like 20 years, and the outcome wasn't only to make it easy to share data but along the way, massive corporations like Google and others were created with many unforeseen applications and successes. I remember in the days when the internet started and people were saying "advertisement is advertisement, it is not going to change", but look at what Google has done just to that industry and how it has changed the way we look at advertising.

And today, we hear the same thing about the blockchain: "Money is money it's not going to change" However, in five years from today we may have a completely different concept and different paradigm about everything, money, data, computing, etc. I also believe that this technology, just coming back to the big picture and adding to Ahmed's previous thoughts about digital economies, will also disrupt countries and disrupt regions.



If you think about it, the Silicon Valley concept is pretty localized and even the dot.com bubble was a fairly local event, but blockchain is a truly global, democratic event where people around the world can participate, not just in transferring Bitcoins and using cryptocurrency but creating technology and being part of the game. Each day, more developers and more companies are joining and tag into this technology, and I think today you don't need anymore to be in Silicon Valley to be a leading player or become the next Google. You could also be sitting somewhere in Nigeria or in Egypt or in Dubai to become the next big company. Add to that the evolution of quantum computing which will accelerate everything even faster.

Ahmed Al-Balaghi: While I am not disputing any of those statements, I think *we also have to be clear that we are living in a world where probably 0.01% of people or less actually care about crypto or blockchain, and maybe that number is even inflated.*

And then secondly, in order to achieve scale and reach and include more people, we also need to have simpler solutions and more user-friendly designed interfaces. I was a guest on a radio show where mid air I was asked to do a Bitcoin transaction just to show how it works because just talking about it doesn't bring across them what Bitcoin is, and honestly, for most people the technicalities involved are above their head, it's super difficult and so in order to go mass market we still need to innovate and adapt to what people are used to. In other words, this should, in the end, be **as easy as a swipe**. We are now seeing Bitcoin wallets that are trying to do it like that, so we're moving closer but it still requires some time.





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Links

Opalesque.TV video which got 104 views over 2016 Christmas:

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Contact

Matthias Knab
Founder
Opalesque Ltd.
www.opalesque.com
Email: knab@opalesque.com
Tel: +49-89-2351-3055
Mobile: +49-170-189-0077

