



INTERVIEW WITH TECH DISRUPTOR
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Seeing a gap in the market for a better way of crypto-mining, tech disrupter Silviu Catalin Balaci discovered, the hard way, that building a high performance crypto-mining facility presents unique challenges that few had previously taken on or overcome. His take on the future of digital currency, blockchain and EvoBits shows there is more than one right answer to digital disruption.



Tell me what it is that EvoBits does?

EvoBits I.T. is primarily a Software Consulting & Development company. We create different applications, mostly around Blockchain, such as e-commerce platforms, Cryptocurrency Merchant platforms, cryptocurrency trading software and mining related software. Everything we make is 100% turnkey for the customer, meaning we take an idea and provide a full solution: planning, development, live deployment, hosting, maintenance.

The Crypto Mining business is a new area that we thought would be a good fit given our expertise in hosting and software. It turned out to be a very successful venture so far.

How did you get into the business of cryptocurrency mining?

It started because we noticed a common problem with our customers: they could not find any honest and reliable large-scale crypto mining companies. After checking the numbers, we reached the conclusion that we can do it better and cheaper than our competition, even if we have other disadvantages (worse climate and higher electricity prices). So, we started with a 100kw proof-of-concept, then a 1MW test facility, then moved to another 3.5MW second test and now we are looking at mass deployment. Every single step has provided a lot of valuable lessons and we are now at a point where we can drastically cut the costs per MW.

Cryptocurrency mining gets a LOT of bad press ... is it all justified?

Yes and No: YES, if you look at now only; NO, if you look to the future. Cryptocurrency is a new technology, roughly a decade old. Being so new, it is constantly evolving. Right now there are a lot of problems, but these are problems that are being worked on and already have promising solutions scheduled for the near future (both in terms of network scalability and the entire "mining" process). Every new field/technology starts by not being efficient: solar panels used to be very weak and very expensive. People often complained that countries should not subsidize and help Solar Power Tech since it makes no economical sense and it is a waste of money.

Look at where we are now, with Solar and Wind power being a lot more efficient and very economical; Electric cars had/have a similar story, they were accused of being very expensive, low performance and "dirty" because of the battery components. Now we are already seeing electric cars that are long range, fast charging, high performance machines. We are also starting to see cheaper models slowly appearing.

My conclusion is this: people that do not care about the future or are simply unable to think ahead will always complain about any new technology. Mining is not a perfect solution, but right now it is a necessary "evil" to secure and support different blockchain projects.



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Power seems to be one of the big negative comments, in so far that a huge amount of energy is used to support the currency compared with traditional currencies. What's your view?

Traditional banking systems have had decades to evolve and to be established. Blockchain technology is a new and like everything new it has areas that need to be improved. The biggest parts are scalability and mining (where the power is consumed). Honestly, long-term I see mining as having a more diminished role in blockchain tech. There are already projects that are experimenting with alternative methods of securing the blockchain (proof of stake as an example), even Ethereum is looking at a hybrid solution and later maybe a full transition away from mining.

Combine the above with increased blockchain scalability and you already have a system that is a lot more efficient per Watt than our current blockchain tech. As I mentioned before, the current mining system is just a temporary “necessary evil” because it is a battle tested way of securing a blockchain. It is a problem that is actively being addressed by the community and I believe we will have different solutions running in the next few years.

Cryptocurrency is underpinned by blockchain technology. How do you think blockchain is going to disrupt the existing compute market and wider business/society?

The blockchain technology is very useful for several industries and types of applications where immutability plays a critical role, but it is not a silver bullet that can be applied everywhere. It makes sense in a record keeping type of application or business (like shipping or trading), but it does not apply that well for all businesses. We are starting to see more and more companies trying to integrate blockchain technology into their day-to-day business and that is very encouraging. The banking sector is working with it now, shipping have also started. If data immutability is needed, blockchain technology is most likely a good fit.

In terms of benefits for businesses: it is easy to work with and reliable by design. Blockchain technology presents a great way of keeping historical data secure and accessible at the same time.

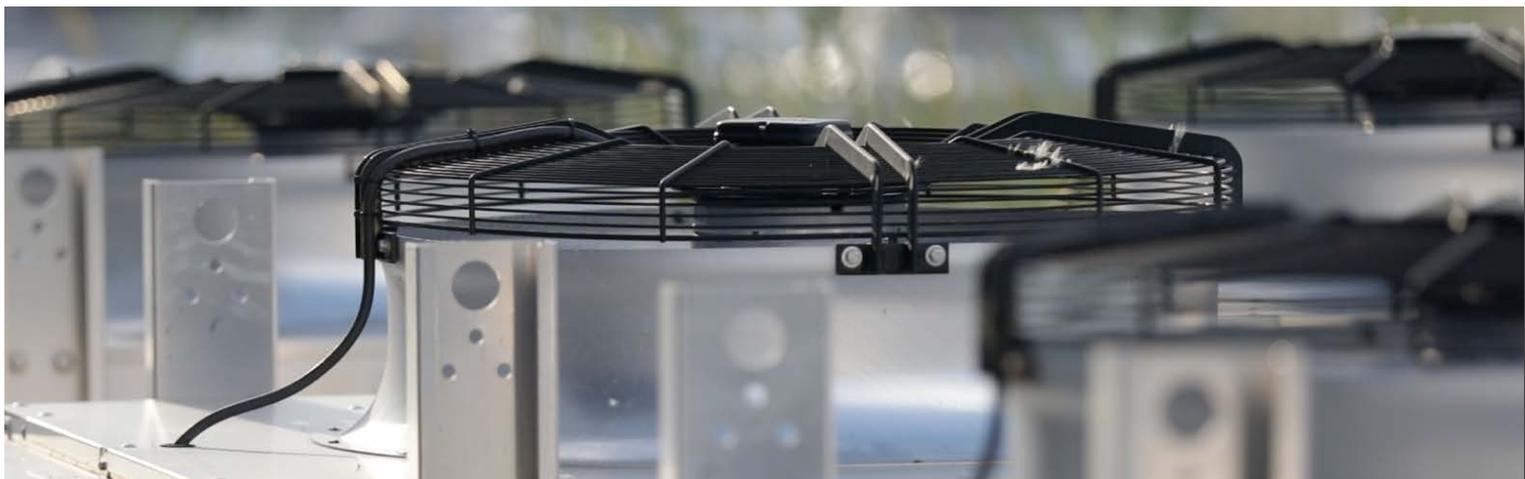
For society: a reliable and tamper proof technology that can greatly benefit everybody if properly deployed. Imagine your tax records always being safe, access to your health records not being dependent on a server being online. The most common comments I see about blockchain technology not being useful are coming from people living in highly developed countries. Those people are most likely living in their own bubble and are shielded from the rest of the world.

They never have issues accessing anything, they can always transfer funds. In reality this is not the case in all countries: you have countries where the National Health Card system has gone offline for days at a time, countries where it is very hard to move money around, countries where there is a high level of election fraud. The thing to remember here is this: just because you do not see how something is immediately useful to you does not mean it is not useful to someone else!

What were the biggest challenges you faced when establishing the business?

By far, the biggest challenge was finding reliable partners. We live in a world where almost everybody wants instant profit, nobody seems to care about the long term benefits. Shareholders seem to care more about the next quarter earnings than about the next couple of years, so it is hard to try and establish long-term relationships with other businesses.

Our initial 1MW project was a complete mess because the partners we chose did not share our long term ambitions for profitable sustainability. We were new in the market and had little bargaining power so they took advantage of that.





You chose Eastern Europe for your facility, with the hot summers why would you not have gone further north to benefit from more free cooling?

There are two key features that define the blockchain technology: it needs to have data immutability and it needs to be distributed. This second point played a big role in choosing the location. Most blockchains are supported and secured by the mining process, but right now miners are themselves grouped in a very limited number of locations.

China has, by far, the biggest share of the miners, the US and Russia is growing fast, Iceland is also big. In order to have a healthy distributed system, you need to have the miners distributed also. Our second reason has to do with our long term plan: we are using the mining business to build know-how. We are not just building mining operations, what we have is much closer to a private data centre.

Is your model different from other cryptocurrency mining operations?

Extremely different: other cryptocurrency mining operations care only about mining as cheaply as possible, we care about mining and also launching ourselves in the data centre business. This requires a significantly higher initial investment but it has a lot of other advantages in the long term. As a perfect example: how many companies from Eastern Europe can claim to have direct experience in building and running multi MW data centres with top-of-the-line cooling equipment?

We will have a huge advantage going forward since we will possess the know-how and have the required experience to build and run data centres. Add to that our strong software background and our business model starts to make sense.

Does that translate to any specific SLA's you have with your customers?

We guarantee on-time deployments and high uptime. We do not lower the mining power when it is hot outside, our miners are online for longer since we have a very low defect rate due to the fact that we keep all the machines running in ideal conditions.

How does the compute and infrastructure architecture differ from a traditional data centre and how? What are the nuances?

There are a lot of similarities to real data centres, but there are differences too. On the similarity side, the data room is very close to a real data centre: from the power distribution method, to the racking system, to the cooling method (cold/hot aisle containment), even the fire suppression system uses inert gas. On the networking side we have multiple fiber lines on different routes, we do our own routing. The equipment we use is also professional Datacenter grade equipment and we have 24/7 security using CCTV cameras, on-site security guards, rapid emergency intervention, etc..

The main difference is in the level of redundant systems: uptime is not critical so we do not invest in power generators and we only have UPS protection for the critical servers/routers (however we designed our data centres to be able to add this at a later stage, if required). We also do not have a multi-tenant environment like a regular colocation data centre since we are the only ones with access. I would say we are closely related to a private data centre that is lacking the power redundancy system.





You operate at full load all the time which is very unusual. Does this give you more flexibility when it comes to service interruption/downtime.

It actually gives us less flexibility because we constantly stress our equipment. We try to keep an N+1 ratio as much as possible, however we cannot always do that (especially in the power department). So that means that if/when we have a critical failure in our power system, we are forced to turn off a part of the miners. However, we compensate this by always having extra miners for ourselves and using those miners to automatically replace the customer machines that go offline.

In the end, the customers do not even notice when there are issues since they are always getting their power. It is always a risk/reward decision. Do we spend a fortune on UPS or is the risk of power interruption low enough that we can compensate in a different way?

What's your average rack density (kW per rack) and what challenges does that present for cooling and power distribution?

We designed our facilities to handle up to 14KW per rack, but our real usage is around 10KW per rack. The power distribution did not present a challenge, however our cooling did require some adjustments. We use a cold or hot aisle containment system (depends on the facility) and the biggest issue for us is how we balance the flow of air: we need to balance the volume of air and also manage the pressure and speed of the air in front of all the racks. This is a challenge, but one that we managed to handle well enough to not represent a big problem anymore.

The way you run your facility has more in common with a high-performance compute lab than a traditional datacenter. But what do you think are the lessons that a more traditional colo or enterprise site could learn from what you've done here?

The biggest thing by far is scalability. Because we deployed the equipment in stages and in the end we run at full power, we have hands-on experience with how a data centre behaves at different loads. We know how the cooling system reacts, how to manage the airflow (it is one thing if our EFCs are at 50% load and give an air speed of 3-4 meters per second and a totally different thing if the air speed is 8-10 meters per second) and now we are building a completely automated data centre management system (AI powered) that will be capable to anticipate and react to potential issues before they happen.

A perfect example: our cooling equipment needs to go in auto-maintenance mode for 30 minutes in a scheduled timeframe. This means that it needs to shut a unit down and that causes an imbalance in the air distribution which causes localised temporary overheating problems. Normally the other cooling units should ramp up to cover the sudden lack of air volume, as they are designed to be reactive which means there is a lag. Our own data centre management software will solve this problem by anticipating the problem and making the proper adjustments before the cooling unit goes offline. These are all lessons that you learn from experience.

If you were building an Uptime Institute Tier III site how would you do it based on experience to date?

Based on the lessons learned: hot aisle containment, a specific way of arranging the cooling units in order to optimize the airflow in front of all racks. We are actually in the planning stage for a Tier III data centre that we want to build.

What do you see as the benefits of indirect evaporative cooling over more traditional cooling design?

The main attraction is the efficiency of the cooling system and the high volume of cold air that the system provides (95.000 m³/h per unit). At outside temperatures of 35-36C, the units were using the supplemental mechanical cooling and we still had a PUE of 1.15 (cold air temperature was set to 20C). After we finished the deployment we started the optimization phase and that allowed us to increase the cold air temperature by a few degrees which in turn translates to even higher efficiency. What I do know is that even in hot conditions they perform. It will be very interesting to follow their behaviour as the temperature drops more and more.

What do you believe the future for Cryptocurrency is?

I believe we are at a stage where it is too late to stop its progression. We are at the last step from Gandhi's quote: "First they ignore you, then they laugh at you, then they fight you, then you win". The cryptocurrency was ignored for a long time, then it was mocked and then attacked. Now we are past that and we start the adoption phase, so we are at the "win" part.

What are your plans for EvoBits?

Short term, continue doing what we do best: software development and expanding the mining business. The cryptocurrency cooldown period is the perfect time to expand since the prices are low now. Medium – long term, we want to heavily attack the data centre business by opening a number of Uptime Institute certified data centres across Eastern Europe. It is a nice business to be in and we are starting to have the experience required to pull this off.



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