Unchaining the Fine Wine Blockchain
From Grapes to Glass

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June 2019

Motivation and scope
Wine fraud is a serious issue, costing the industry billions and increasingly causing reputational damage to producers and secondary market players like auction houses. Blockchain technology registers each transaction on a decentralized, immutable, trustless and transparent database, and thus, has been proposed as *the* state-of-the-art measure to rekindle trust in fine wine trade. Given these characteristics, three wine use cases deserve particular attention, that is, authenticity verification, supply chain traceability and market making.

Research question
The objective of the qualitative study was to provide a status quo assessment of technological and business model maturity of emerging wine blockchain ventures as well as adoption readiness on behalf of relevant players in fine wine trade. Research questions included the following: What is the value proposition and competitive advantage of a blockchain solution? Who are the key players involved in authentication and value chain recording? What are limitations and challenges for adoption? What are the economics of the business models?

Methodology
Following an extensive literature review, I conducted five interviews with blockchain and fine wine experts (Artory[1], Omniaz[2], The Fine Art Ledger[3], Vinsent[4], Dada[5]) in the spring of 2019. Phone interviews lasted between 30 minutes and an hour.

Content
Blockchain start-ups like Everledger offer counterfeiting protection and supply chain transparency of (fine) wine. In particular, blockchain technology provides the public database and digital record of value and other technological developments, like NFC chips and QR codes, establish the one-to-one relationship with the physical bottle of wine. For customers, such an immutable ledger may provide real-time information on provenance and authenticity; for producers it may contain information on price developments and changes of ownership. Importantly for privacy concerns, the owner does not need to be disclosed by his/ her name but could simply be identified by an encrypted hash.

      The quality of information provided, however, is only as good as the raw data provided at the point of registration. This is why trustworthiness of the registration source is important. For full supply chain transparency, every single gateway from grape growers to wineries, distributors and retailers would need to be onboarded to register a timestamped permanent record of the transaction. Given the multitude of actors involved in a typical wine lifecycle, this bears

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[1] https://www.artory.com/
[2] https://omniaz.io/
[3] https://www.thefineartledger.com/
[4] https://www.vinsent.wine/
[5] https://dada.nyc/home

enormous practical implementation challenges. However, if producers across geographies supported registration before wine left the winery, the emerging global database would certainly solve future counterfeit issues. Innovative NFC tags that are attached to the neck, capsule or top of the cork, instead of the label, further prevent the risk of re-filling an authentic bottle.

Regarding wine already in circulation, this "first registry" problem could be tackled by another trusted source along the wine value chain e.g. by auction houses, large retailers or wine experts that provide authentication services to rare wine collectors.

Once wine is verified and registered on a blockchain, new business model options emerge. In particular, tokenization establishes a monetary value for collectable wines that are resold in secondary markets. For one, this can have market-making ramifications among secondary market players, like collectors, who can directly exchange wine on a peer-to-peer level. This value proposition is also attractive to wine insurers, who will have an overview of the collectables, and lenders (e.g. banks) as it provides the collateral.

Regarding the maturity of the technology, most blockchain ventures are still in the early stages of development and the technical requirements are still difficult for many traditional supply chain players to adopt. The current solutions are therefore likely to attract only the more tech savvy wineries and consumers. Further, the current cost of technology in relation to retail prices may not be justified for mass-market wines unless market conditions demand for it (e.g. in China or premium wine niches).

For adoption to increase, platforms need to be credible, win the early adopters, and then other people will follow suit ("Network effect"). In particular, there needs to be demand, that is, consumers and collectors will need to ask for it. However or luckily, most wine consumers today do not fear that the wine they order in a restaurant or purchase in a wine shop may be fake. That means that the proof of authenticity alone may not be enough of an incentive for consumers to scan the QR code or NFC chip. Therefore, producers may need to equip the tag with additional content, such as information about winemaking, serving recommendations or marketing materials like loyalty points and discounts. Such developments may intensify the producer-consumer engagement relationship and bring additional benefits.

Conclusion

Overall, in evaluating the merits of a blockchain solution for counterfeiting protection, I feel that the applause it receives for (theoretically) solving supply chain transparency issues across industries is well deserved. From my understanding of other emerging technological developments, there is no better alternative to be launched anytime soon. However, practical implementation difficulties may delay large-scale uptake in the immediate future.

First, the emerging blockchain companies are still unknown to the relevant wine consumers and new entrants would need to become much more consumer-oriented to attract market share. Second, established producers lack an incentive to take that path; the economics of blockchain-based business models do not work out with insufficient demand on behalf of wine consumers and collectors. Thirdly, the wine market has historically been rather conservative and unless there is a good enough reason to change, radical transformation is unlikely.

In my view, the road to success will be for producers to first connect to the internet of things (IoT), Then, once a new standard of bottles with a unique identifying tag is established, blockchain-based authentication, supply chain tracking and market-making business models stand a real chance to develop.