

## **Working title:**

Building the Future of Real Estate Through the Blockchain.

## **Project Purpose:**

This is a creative project to provide a working proof of concept of how the blockchain can simplify, speed up, and secure the real estate transaction process.

## **Project Importance:**

Advances in open source and decentralized technologies have not yet reached the real estate sector. Currently, property listings and transaction data are tightly controlled by centralized organizations, poorly maintained and updated, and locked down in distinct regional databases. Blockchain combined with real estate can eliminate the need for intermediaries like lawyers, agents, and title companies, drastically reducing the time it takes to close on a transaction and provide a more secure transaction through better compliance and security.

## **Project Overview:**

I purchased a home in the summer of 2019 and never had I felt so confused. I couldn't understand why so many people needed to be involved in the process. Was this a situation where I was simply overpaying because I was unaware of how to actually do the process? As I began to research the transaction process, I began to see that very little has changed in the way we transact property over the last 50 years. Multiple stakeholders, data sources, service providers, regulators and government agencies take their slice of the transaction pie as a transaction marches from list to close.

I spoke with lenders, escrow officers, brokers, real estate agents - each person who was getting a cut of the pie and while I do understand that they have their respective licensees, I didn't sincerely see their value justified in the price they charged. I paid a couple thousand dollars just to sign the contract, not including the money I had to put down for the loan. Ultimately, I felt that the transaction process was significantly more costly, complicated, and time consuming than it needed to be.

Through my research I identified five pain points of the current real estate transaction process. The objective of this creative project is to address all five of these issues in a proof of concept solution.

1. Inefficient property search process
2. High title insurance costs to transfer property ownership

3. Slow, expensive, and difficult cross-border transactions
4. Inability to create fractional ownership
5. Absence of real time data

To address these five issues I will build a web application that simulates the real estate transaction process. This proof of concept will replicate property listings, the transfer of property titles, and the ability to create fractional ownership of homes. This custom storefront will be hosted on OpenSea which is a decentralized marketplace powered off Ethereum.

Blockchain technology can be used to overcome these barriers by providing a way to securely share and transact data. Shouldn't purchasing a home be like purchasing something off an online marketplace? Should we be allowed to diversify our investments by owning partial shares of homes? Should it really take weeks to underwrite the contract? The more I looked at these questions, the more I saw a need for change.

So far I've read whitepapers of all the leading companies who are pushing blockchain real estate technology. I've researched the buying and selling process enough to confidently understand how to buy a home by cutting out all of the unnecessary middlemen. I've begun learning blockchain development. I've sketched out a proof of concept that could facilitate an online real estate marketplace that incorporates smart contracts.

## **Thesis Committee:**

### **Qualifications of Thesis Committee:**

#### **Mark J Keith - Thesis Advisor**

Dr. Keith is the David and Knight Fellow and Associate Professor of Information Systems in the Marriott School of Business at Brigham Young University. His research focuses on behavioral implications of information privacy and security, creative self-efficacy and problem solving in the information systems discipline, and the systems development life cycle. His research has appeared at Information Systems Research, Journal of Management Information Systems, Journal of the Association for Information Systems, Information Systems Journal, Decision Sciences, Decision Support Systems, Computers in Human Behavior, International Journal of Human-Computer Studies, Communications of the AIS, Decision Analysis, and other journals and leading international conference proceedings. His current teaching focus is machine learning and data science.

#### **Selected Publications:**

1. "Overview and Guidance on Agile Development in Large Organizations", Communications of the Association for Information Systems, Volume 29, Issue 2, 2011
2. "Examining the Continuance of Secure Behavior: A Longitudinal Field Study of Mobile Device Authentication", Information Systems Research, Volume 27, Issue 2, Pages 219-239, 2016

**Steve Liddle - Faculty Coordinator**

After earning his PhD in computer science from BYU in 1995, Liddle joined BYU's business school faculty. While at BYU Marriott, Liddle has taken on many different roles including faculty advisor, interim director, director, academic director, and executive director of the Rollins Center for Entrepreneurship and Technology, which began as the Rollins Center for eBusiness and later merged with the BYU Center for Entrepreneurship. Dr. Liddle holds the J. Owen Cherrington Professorship in the Department of Information Systems. He teaches mobile app development, web development, systems design, and other topics related to the practical application of computer systems and conceptual modeling.

**Selected Publications:**

1. "Conceptual-Model Programming: A Manifesto", Handbook of Conceptual Modeling: Theory, Practice, and Research Challenges, Pages 3-16, Springer, Berlin, David W. Embley and Bernhard Thalheim, 2011
2. "Model-Driven Software Development", Handbook of Conceptual Modeling: Theory, Practice, and Research Challenges, Pages 17-56, Springer, Berlin, David W. Embley and Bernhard Thalheim, 2011
3. "A Web of Knowledge: A Conceptual-Modeling Perspective", Lecture Notes in Computer Science, Volume 6520, Pages 137-160, Springer, Berlin, Roland Kaschek and Lois Delcambre, 2011

**Barrett Slade - Faculty Reader**

PhD, MAI and Professor of Finance and Real Estate at the Marriott School at Brigham Young University, is the author of *The Valuation of Office Properties: A Contemporary Perspective*, published by the Appraisal Institute. His research has been published in numerous real estate finance and economics journals including *The Appraisal Journal*, the *Journal of Real Estate Finance and Economics*, *Real Estate Economics*, the *Journal of Real Estate Research*, the *National Tax Journal*, the *Journal of Real Estate Practice and Education*, the *Institutional Real Estate Letter*, *Real Estate Review*, and the *Journal of Real Estate Portfolio Management*.

**Selected Publications**

1. "Assessed Valuation and Property Taxation of Multi-family Housing: An Empirical Analysis of Horizontal and Vertical Equity", *Journal of Real Estate Research*, Volume 27, Pages 17-46, American Real Estate Society, 2005
2. "Do Out-of-State Buyers Pay More for Real Estate? An Examination of Anchoring-Induced Bias and Search Costs", *Real Estate Economics*, Volume 32, Issue 1, Pages 85-126, 2004
3. "Some Loans Are More Equal than Others: Third -Party Originations and Defaults in the Subprime Mortgage Industry", *Real Estate Economics*, Volume 30, Issue 4, Pages 667-697, 2002

## **Project Timeline:**

- June: Submit proposal, compile research, learn blockchain programming technologies.
- July: Report draft - document will consist of the following points: overview of current process, pain points of current process real, overview of a blockchain enabled process, proof of concept, suggested adoption and future steps.
- August: Build proof of concept - a web application will be built to simulate this transaction process and create a storefront run on the blockchain for purchasing real estate.
- September: Revise and edit - seek feedback and edit according to committee results.
- September 14: Final deliverable - defend thesis, submit thesis defense form.

### Thesis Deadlines (for graduation):

- September 15: Submit thesis proposal
- February 19: Thesis defense information form
- March 12: Submit thesis
- March 19: Final thesis

## **Funding:**

I do not expect the completion of my thesis to require funding.

## **Culminating Experience:**

I want to compile this research into a working proof of concept. I plan on documenting the entire process and making the final deliverable open source. It will be available for the entire internet to add, modify, and perfect. My belief behind this idea is that the more people who are working on this problem, the faster a real solution can be developed. I believe that open source projects fundamentally produce better software. I feel that this is the type of solution that needs to be made public. If the solution is privatized, it will likely reinvent a new host of unnecessary middlemen and fees.

## **Conclusion:**

I want to add to the current body of evidence that is being built out by researchers around the world. The more information available on this topic, the more advances will be made in the transformation of this industry. Blockchain is a powerful technology that has the ability to secure and simplify many of the pain points in real estate. While it is not a cheap technology to use nor is it a simple implementation, the objective of this project is to prove that there is a way to simplify, speed up, and secure the real estate transaction process.

## Sources:

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Konashevych, O. (2019), "Cross-Blockchain Databases for Governments: The Technology for Public Registries and Smart Laws", ArXiv.Org

Seuren, F. (2018), "Introducing blockchain to commercial real estate", Delft University of Technology, Delft.

Surabhi Kejriwal, Saurabh Mahajan, "Blockchain in commercial real estate", Deloitte Center for Financial Services, September 2, 2017.