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CS 499

Module 5 Journal

Two fresh developments in the field of computer science are edge computing and blockchain technology. Edge computing is a distributed computing model intended to reduce latency by bringing computation and data storage closer to the physical sources of data. Blockchain technology, while heavily associated with cryptocurrencies, has recently been applied towards the purpose of secure data storage, identity validation, and supply chain management.

Edge computing has impacted the field by shifting architectures away from cloud-based models and towards distributed ones. This means that architectures can become more lightweight, use less power, and handle computations more efficiently. The downside to this change is that new methods of security must be developed to protect against emerging vulnerabilities. Impact on everyday life from this model will be noticeable, namely though faster response times from applications. Logistical concerns might also benefit from faster real-time monitoring and predictive maintenance systems. Background effects may be things like greater energy management for electric utilities and more reactive automated traffic management.

Blockchain technology is introducing new security paradigms for data, such as smart contracts. Smart contracts are digital agreements stored in a blockchain that automatically execute actions when certain conditions are met. For example, a smart contract might be used to automate the transfer of property ownership. A seller could list their property on a blockchain-based marketplace and store the details (price, ownership, legal considerations, etc.) on a smart contract. The buyer can then send the listed amount of cryptocurrency to the smart contract. The contract will hold the funds in escrow until the transaction is verified and legal checks are performed. Once that’s done the contract will automatically transfer ownership to the buyer and update the ownership details. The entire process is therefore automated and cannot be tampered with one the contract is written.

Regarding my future career, edge computing models are both an unexplored field and a potential methodology for larger computing solutions. The latter factor means that I can help develop new security methods for edge computing models. The former is something I view as a tool to apply distributed models in a way that means client requirements. Blockchain technology is largely about security, but still useful to full stack development. A lot of processes can be automated in a secure way through tamper-proof ledgering. This trait also makes it useful to transparency in regards to public-use applications like for banking or voting.

The final unmet outcome was building collaborative environments. A shared database manager that has been refactored and optimized for use in a real-world application meets that requirement.

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| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | CS 405 Module 1 Assignment\_King | HashTable | CS 340 Project Two\_King |
| **Status of Initial Enhancement** | Complete | Complete | Complete |
| **Submission Status** | Complete | Complete | Complete |
| **Status of Final Enhancement** | Incomplete, pending Module | Incomplete, pending Module | Incomplete, pending Module |
| **Uploaded to ePortfolio** | Incomplete, pending Module | Incomplete, pending Module | Incomplete, pending instructor review |
| **Status of Finalized ePortfolio** | Incomplete | Incomplete | Incomplete |