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Executive Summary:

In this report, the Block-chain technology in Florence Healthcare has been analyzed. The report involves different perspectives associated with the implementation of block-chain technology and how it is providing maximum benefits to healthcare organizations. The company is facing many challenges by implementing this new technological change, but this change is also facilitating Florence Healthcare in the future. These challenges include decentralization of database, involvement of Executives in Block-chain planning, featuring as highly secured technology, cost-effectiveness, and measures taken by other healthcare companies or competitors. This report also analyzed the partnership between Florence and Verady for successful planning and implementation of block-chain technology.

Furthermore, this report evaluates the future of Florence healthcare which includes Smart contracts, patient data security, supply-chain management, and advancing research and development. Also, the areas included in Block-chain are discussed along with their impact on the healthcare management process. This data management technique is highly beneficial for Florence Healthcare and all other healthcare service-providing organizations.

Company's Introduction:

Florence Healthcare, located in Atlanta, Georgia, is a platform that ties up pharmaceutical companies and analyzes various sites to separate tests for developing drugs. The company assists in analytical research by using the software. Florence provides a shared platform to replace analytical paper files, source binders, and testing master files. The benefit of this shared platform is to make possible the review of e-Source and e-Regulatory documents. Numerous sites and sponsors worldwide trust e-Binders to evaluate past procedures and develop new approaches to trial management.

Competitors of Florence:

Top competitors of Florence Healthcare are:

- Iseco Sistemas
- 1Factory
- Kalderos
- Legacy Data Access

Block-chain Technology in Florence Healthcare:

There are five important facts about block-chain technology that will help Florence Healthcare to be prepared for future challenges. These facts are:

1. **Decentralized Database that Acts as Changeless Ledger:** Block-chain is an international directory that is a trustworthy computerized ledger of economic proceedings that can be organized for financial transactions (Florence, 2022). This system will also deal virtually with other human affairs like birth and death certificates, undertaking and activity of

ownership, marriage licenses, bank accounts, educational degrees and programs, medical treatments, security declaration, votes, and all other transactions which require code.

2. **Involvement of Executives in Block-chain Planning:** Almost 22% of Executives are planning for short to mid-term block-chain systems. Florence healthcare will get maximum benefits from this procedure in the future because it is a cost-effective and efficient system.
3. **Featured as Highly Secured Technology:** Block-chain is highly secured because records are maintained through cryptography. In Florence healthcare, the patients will be provided with their personal private keys, which are allotted to make transactions, and this key is a personal computerized signature of the participant. In case of any alterations in records, will consider the signature invalid, and the system will quickly notice that something has taken place.
4. **Cost-Effective Method:** By sharing infrastructure, the duplication of information will reduce because every industry will use similar information through the implementation of block-chain. This is a cost-saving method for Florence healthcare and other industries. This technique reduces the number of operations in traditional records-keeping methods, hence making it a cost-saving method.
5. **Various Measures by Healthcare Companies with Essential Clinical Trial Indications:** It is evaluated that the block-chain backed directory will provide organizations and their consumers the most recent and updated contact information to facilitate the healthcare providers. Therefore, Florence Healthcare will get maximum benefit block-chain system as it saves time, energy, and money to get up-to-date information about patients as well as medical service providers.

Florence and Verady Promoting Clinical Research and Healthcare with Block-chain:

Florence and Verady established a partnership to promote clinical research by using the software. Both companies have announced the partnership to develop functions that allow a block-chain for promoting healthcare and clinical research. Florence is one of the leading enterprises in clinical research and gives directions to control patient and tested data for uncountable clinical researchers and sponsors. On the other hand, Verady is involved in technological development to provide asset guarantees through an easy and reliable block-chain. An Application Programming Interface (API) by Verady's will provide a flexible interface to extract away the complications of the block-chain for the customers of Florence (PRnewswire, 2017).

The CEO of Verady, Kell Canty, said: "The technological services provided by our company will help pharmaceutical companies and healthcare service providers to quickly trace critical data and effectively use this data in a secure block-chain system. Our new privacy controlling system through block-chain will facilitate Florence to use patient's data in new ways and assist the investigating teams in providing advance discoveries."

Future of Florence by Implementation of Block-chain Technology:

The greatest benefit of a Block-chain in the healthcare industry is the security of patients' data. It becomes difficult to hack data because of the decentralization of data storage. Various servers are interconnected with each other, due to which data cannot be separated from one server. It requires to attack above 50% of servers to accommodate the network. While considering health data storage, a patient has a personal password in a database network. This password is used to access the health records. This technique is helpful to maintain accurate data for health promotion and reduces the risk of data vulnerability. A unified data system helps both patients and groups of patients find patterns and disease spread as soon as possible. The application of Block-chain technology will facilitate Florence's healthcare in the following ways:

- **Supply-chain Security:** This technology facilitates reshaping the supply chains throughout the healthcare sector. Every transaction in Block-chain is recorded in an unalterable ledger which provides assistance to vendors of a supply chain in healthcare like Medtech enterprises to trace the compounds and raw materials from the source to the company. When the suppliers log in the entire information into the ledger, the stakeholders can easily access the data to validate and recognize fake products, collapsed materials, and other breakdowns to confirm and support the cold chain.
- **Patient's Control Over the Data:** One of the major advantages of block-chain technology is to give patients control over their personal data. The entire medical information of the patient is recorded by technology. Every transaction is managed on a Block-chain record to empower patients to manage an entire audit series of doctors, payers, suppliers, medical equipment, health information exchange, and any other authorized person who has access to the data.
- **Smart Contracts and Computerized Manual Procedures:** Block-chain technology is the biggest solution for the problem of interoperability, and the solution they provide is known as Smart Contract, which includes scripts of pre-determined rules. For example, a patient completes paperwork by a medical practitioner at one clinic, and after a few months, he goes to some other specialist. A Smart Contract will automatically transfer complete information based on pre-determined rules, which helps automate the process. It is an error-free process and helps in secured payment. It also reduces conflicts between healthcare providers, patients, and insurance agencies because the standardized transaction takes place between the three parties.

- **Advancing Research and Development:** Block-chain technology helps in smooth-running research and development processes by making them more innovative and cost-effective. This technology automates the documentation, collaboration, and maintenance of keeping test agreements by MedTech and pharma companies. This technological change eased the recruitment process where patients can enroll for tests, and their eligibility can be automatically verified and assessed. The process of data gathering can also be made easy and free of errors through Block-chain technology as it helps to store entire data consistently in an easy-to-access infrastructure where patients use their private keys. This clinical information is reliable and verified (Baruah, 2021).

Block-chain is integral to healthcare organizations for different reasons. It allows the safe sharing of personal information without copying it and effectively minimizes mistakes in healthcare documentation. The information is marked with a date to make it more secure. Payments are streamlined with this technique throughout healthcare organizations. It abolishes the need to depend on unmanageable and costly equipment by reducing expenses.

This technology also allows data sharing between healthcare researchers and scientists throughout the world. It enables them to solve complicated problems in the medical field like diseases. Block-chain technology also enables a healthcare organization to provide finances for research by using cryptocurrency. Associated legislative bodies will ensure the fairness of procedures worldwide. Block-chain also provides collaborative means to healthcare agencies to reduce inconsistency while tackling the diseases.

Areas Affected by Block-chain Technology: The areas affected by Bloch-chain in the healthcare industry are:

- **Manufacturing of Drugs and Supply-chain Management:** Block-chain can develop unchangeable batch records of drug's emergence and components which decreases the risk of errors. These records are helpful in the recollection of drugs.
- **Clinical Tests Management:** Testing is a complex procedure. Block-chain provides opportunities to facilitate these trials by securely protecting the personal information of patients. It ensures that transparent communication takes place between patients, sponsors, managers, healthcare providers, and stakeholders.
- **Keeping Records of Patients Data:** Various complications related to patient cases are streamlined through Block-chain. For instance, patient records are well-maintained through Smart Contracts.

Major Challenges of Block-chain Integration in the Healthcare Industry:

Block-chain integration involves various challenges that need to be overcome before the implementation of this technological innovation. These challenges are:

- Assimilation of data
- Execution of change management and transformation
- Coordination between Block-chains
- Trademarks and license of Block-chain
- Back-up and safety of data
- The adaptability of agreeable/ non-agreeable Block-chains
- Integration of legislative bodies
- Establishing smart contracts
- Operational costs

- Block-chain distributors

Block-chain Solution for Record-Keeping in Healthcare Industry:

This new emerging technology is the most suitable method to digitally record the data of patients in the healthcare industry, where agreement and authentication of data integrity are essentially required. It is the best technique to keep the medical information of patients safe and secure. This technique also facilitates the constant and stable growth of transactions. Physicians can easily perform online monitoring and telehealth consultancy. Due to this feature, patients get an opportunity to inform their doctors about their medical or health-related history. Data is encrypted before adding to the chain, which makes it unchangeable and impossible to decode. The use of smart contracts in the Block-chain permits an efficient model of payment where the element of mistrust between medical service providers and payers is abolished (Attaran, 2020).

Conclusion:

The implementation of block-chain technology in Florence healthcare is beneficial as it maintains a list of electronic records, every unit is time-stamped, and availability of previous information in the chain. Cross-industry partnerships are potentially enhanced through Block-chain technology along with trust-building and interoperability. Tracing of tangible and intangible operations is done effectively (Joshi, 2020). Currently, the majority of physicians are stuck on traditional methods of paper records, and it is challenging for the healthcare industry to move them to electronic record keeping. Technology is not difficult because it is already built but managing the change is a huge task. In order to move Florence Healthcare forward, the implementation of Block-chain technology is a feasible solution (Childrenmercy, 2018).

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