Institution Details

Province	Sindh	**City**	Jamshoro
Institution	Mehran University of Engineering & Technology	**Campus**	Main
Department	Computer System Engineering	**Degree Level**	BE
Degree Program	Computer System Engineering	**Telephone**	
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Head of Department Details

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Project Group Details

Team Lead	Team Member's Name	Team Member's Mobile	Team Member's Email	Team Member's Institution Registration Number	Team Member's Year of Study	Team Member's Semester	Team Member's CNIC
YES	Muhammad Waris	03312005331	16cs44@students.muet.edu.pk	45912	4	8	4220123028935
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Project Details

Project Title	Decentralized E Voting using Blockchain
Project Area of Specialization	Blockchain

Project Start Date	2018-10-22	**Project End Date**	2019-09-01

Project Summary (less than 2500 characters)	This project is aimed to develop a Decentralized e-voting system based using Blockchain, since the existing voting systems, whether conventional or electronic, involve insufficient levels of transparency. The election data is under control of a third party which makes it extremely difficult for voters to ensure that their electoral votes are counted carefully and accurately by the election administrators. Blockchain technology is one of the solutions because it embraces a decentralized system and the entire ledger is owned by many users. By adopting blockchain in the distribution of ledgers on e-voting systems can reduce one of the cheating sources of database manipulation. The core idea is to combine the blockchain technology with Paillier Cryptosystem and homomorphic encryption in order to realize the decentralized e-voting application without a trusted third party. It provides a public and transparent voting process while protecting the anonymity of voter's identity, the privacy of data transmission and the verifiability of ballots as well.

Project Objectives (less than 2500 characters)	The objectives of the project are:
	- To develop such a system that is tamper proof and no single entity has control over the election data. - To make elections accessible to the voters so they can participate in a modern, convenient and fair way. - To develop such a system that provides a substantial level of transparency by sustaining an exposed registry of votes, while defending the privacy of the voters. - To develop a mobile application for casting votes and a web application to show the results after the election ends.
Project Objectives (less than 2500 characters)	The objectives of the project are:

Project Implementation Method (less than 2500 characters)	This system can be deployed by the election administrators on Tablet devices placed inside the polling stations, though it can be implemented in a way that everyone can vote from their home but, it not possible since only 35% of the total population own smartphones in Pakistan. Mining/Validation nodes can be divided among the election administrators, government, civil society, enterprise e.t.c. for checking the validity of the votes and voters.
	Biometric fingerprint verification:
	The verification will be done from the database of registered voters for granting permission to cast a vote.
	Permissioned Blockchain:
	Available for everyone to read, but don't allow anyone to be a node, serving the network's security, transaction verification or mining.
	ElGamal/Paillier Cryptosystem (Homomorphic Encryption)
	The anonymity and security can be achieved by the secret sharing scheme with Paillier's public-key cryptosystem and the homomorphism feature allows one to operate on ciphertexts without decrypting them. For a voting system, this property allows the encrypted ballots to be counted by any node without leaking any information in the ballot.
	Digital Signatures:
	To sign the voter's ballot, so that no can tamper with the ballot. And the voter can use his/her private key to verify the ballot.

Benefits of the Project (less than 2500 characters)	The benefits of the project are as follows :
	• The interest in blockchain technology taking over from traditional election methods has potential advantages due to the big technological upgrade from how elections are currently held. Many national elections still take place using a paper-based system, leaving open huge holes for security breaches, fraud, and corruption.

• Blockchain offers an updated system for voters that could potentially fix these concerns.

• Its traditional assets, such as its transparency, allow for votes to be followed, counted, and correlated by many different sources while still maintaining the privacy of the voters due to the anonymous transactions along with the blockchain.

• Minimize the paperwork in order to put end to paper waste and reduce the human resource required for carrying out the election.

• Elimination of political and unfair business since it is decentralized the voting system will not be in control of any third party.

• E-voting will make elections less costly.

• It will reduce the amount of time and human resources required to conduct elections. |

Technical Details of Final Deliverable (less than 2500 characters)	The final deliverable will be a Permissioned Blockchain molded for carrying out E-Voting. A mobile application to be deployed on Tablet devices placed inside the polling booths. A web application, which will be available for the voters to see the results after the election ends. And verify their ballots as well. And another application for the mining/validation nodes. The final prototype will be presented at the Final year project exhibition held at our department, and our plan is to conduct an election for the best project using our E-Voting system.

Final Deliverable of the Project	Software System
Type of Industry	Others
Technologies	Blockchain
Sustainable Development Goals	Peace and Justice Strong Institutions

Project Key Milestones

Elapsed time in (days or weeks or month or quarter) since start of the project	Milestone	Deliverable
Month 1	Understand and research the need of the system	Project Idea
Month 2	Requirement gathering	Understanding requirements of an E-Voting system
Month 3	Research on Blockchain	Understanding Blockchain technology
Month 4	Basic code implementation of a Blockchain	Blockchain running on single node with PoW
Month 5	Blockchain design in context of E-voting	Complete System Design
Month 6	Testing multi node implementation of Blockchain	A completely working blockchain.
Month 7	Implementing E-voting system on the Blockchain	A basic blockchain based E-voting system
Month 8	Testing the system (black box testing, system testing)	Bug free system.
Month 9	Adding Bio metric fingerprint verification module	Finalized system
Month 10	Documentation	User manual
Month 11	Thesis write up	Complete project and Thesis.

Project Equipment Details

Item Name	Type	No. of Units	Per Unit Cost (in Rs)	Total (in Rs)
Tablet devices	Equipment	2	15000	30000
Biometric Fingerprint scanner	Equipment	2	2500	5000
Thesis printing and binding	Miscellaneous	5	1200	6000
Poster	Miscellaneous	1	900	900
			Total in (Rs)	**41900**

I affirm that all information submitted through this FYP application is correct and complete as to my best knowledge. I further

agree that Ignite can approve, reject, defer or cancel this FYP application without mentioning any reason at any stage of NGIRI 2019. Information cannot be changed after submission.

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