



IS480 Project Proposal FlowLabs – Middleware

Ducky King

V 2.0

19 JUNE 2017

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FACULTY SUPERVISOR:

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SPONSOR: FLOWLABS

- **Yusho Liu** (yusho@flow-labs.co) – Co-founder
- **Gerry Eng** (gerry@flow-labs.co) – Co-founder
- **Ted Huang** (ted@flow-labs.co) – Co-founder

PROJECT OVERVIEW

1.1 Project Description:

Our project aims to optimize and streamline the trading process in the Liquefied Natural Gas (LNG) industry with a platform customized to the traders' needs. We are pioneering and developing the middleware built on the Ethereum blockchain to power a decentralized trading platform to enable LNG traders to conduct both short and long-term capacity trading efficiently while protecting trader anonymity. It is the first of its kind in the industry. Our team's X-Factor is to have a production-ready FlowLabs LNG Trading Platform powered by the Ethereum blockchain, focusing on anonymity and security, with transaction values expected to be minimally exceeding \$10,000 and 99% successful execution of smart contracts.

1.2 Motivation:

Global demand for LNG is forecasted to rise more than 30% to 353.43 million tonnes per year between 2016 and 2020 while global LNG supply is expected to increase at a far greater rate, reaching 452 million tonnes per year. However, the LNG market is currently being dominated by large traders that dictate long-term contracts worth millions of dollars (USD) accounting for 71% of total gross LNG trade in 2015. These long-term contracts lock in traders for long periods and are mostly only accessible to the bigger players in the industry. Many trades that occur are also relationship-based which brings about huge barriers of entry for smaller players. In addition, the process of actualizing the contract is a highly manual process, where most of the trade negotiations are conducted through phone calls, emails or even fax.

The oversupply of LNG today presents a unique opportunity for FlowLabs to build a decentralized digitalized platform that facilitates LNG trades such as spot and short-to-medium-contract trades to increase liquidity and price discovery, and to allow any trader to easily participate in the global market, adding value to the LNG ecosystem. By pioneering this movement, FlowLabs plans to monetize the platform through transaction fees for each trade as well as subscription fees to utilize the platform, potentially standing to take a huge slice of the pie as they will be the first mover in the industry.

1.3 Stakeholders:

SPONSOR	Yusho, Gerry and Ted are the co-founders of their startup, FlowLabs. They are seeking help to build a decentralized digitalized platform to allow LNG traders to facilitate trades while protecting their privacy.
USER	The main users of the platform will be current and incoming LNG traders as well as LNG companies in the industry.
ADVISORS, PRACTITIONERS, MENTORS	Mentors with trading background in the LNG and Oil & Gas industries will come in to supplement our knowledge on the LNG market which will allow us to create a platform to streamline the current manual trading process. User feedback will also be recorded for development purposes to improve our product.

Table 1: Project Stakeholders

1.4 Deliverables:

OUTCOMES: Production-ready trading platform utilising Ducky King's middleware powered by the Ethereum blockchain for use by the traders.

VALUE STATEMENT: We are building the very core of FlowLabs' business model. By leveraging on blockchain technology to create the middleware for a decentralized trading platform, FlowLabs aims to streamline the highly manual trading process currently ongoing in the LNG industry as well as to make trades more transparent to enable incoming, smaller traders to be a part of the LNG trade ecosystem. The trading platform will increase overall liquidity in the LNG market through fostering greater price discovery, easing the current oversupply as more traders will be able to make more short and medium-term trades.

1.5 Scope:

CORE FUNCTIONS

SMART CONTRACT MODULE

- Generation of Smart Contract
- Smart Contract Attributes and Trading-Related Entities

BLOCKCHAIN INDEXER MODULE

- Script Hooks for Blockchain Explorer
- Automated Caching of Relevant Trade Information through SQL Scripts

SECONDARY FUNCTIONS

TRADING EVENTS MODULE

- Event listener for Traders' related trades
- Event broadcaster for Traders' related trades

TRADING PROFILE MANAGEMENT MODULE

- Traders' Dashboard Query Endpoints
- Traders' Events Query Endpoints

PKI INFRASTRUCTURE MODULE

- Public key storage and management
- Secure distribution of keys

TERTIARY FUNCTIONS

CHAT ENCRYPTION MODULE (GOOD TO HAVE)

- Encrypted chat channel between traders during negotiations

Figure 1: Project Scope

PROJECT PLAN

2.1 Project Milestones:

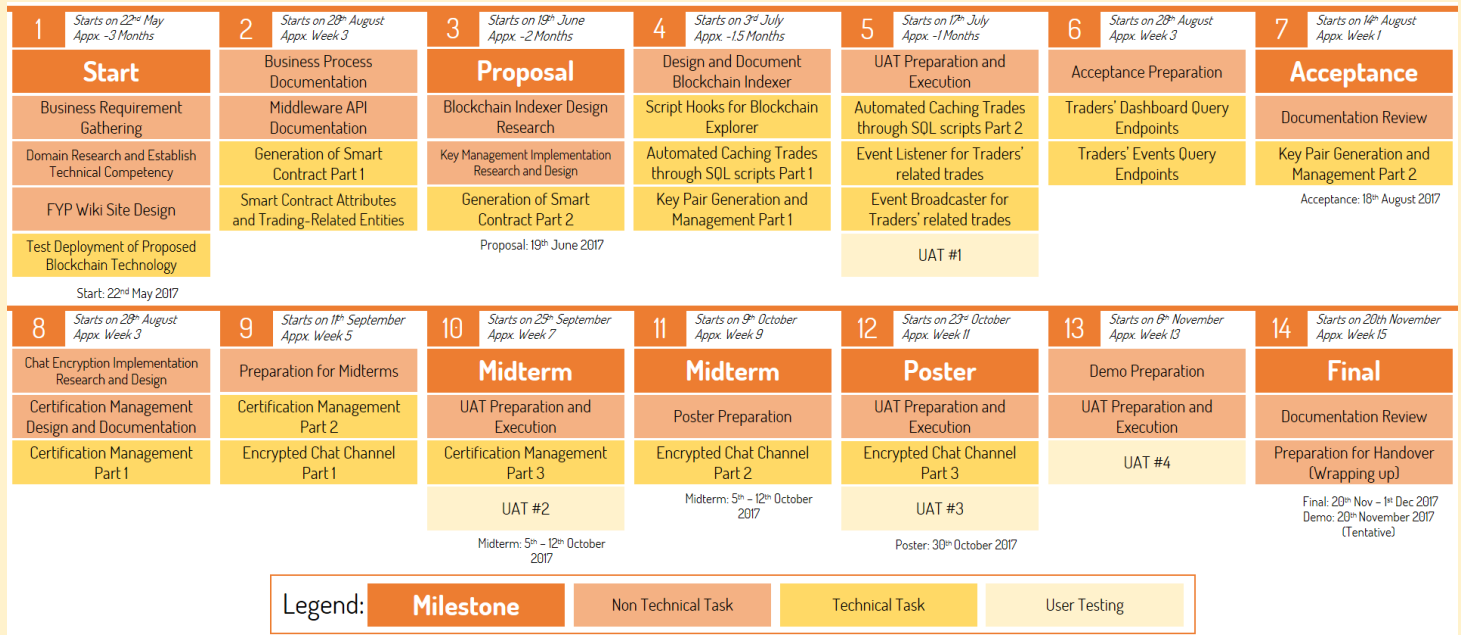


Figure 2: Project Timeline

2.2 Risks:

Risk Category Table	Likelihood		
	Low	Medium	High
Impact			
High	B	A	A
Medium	C	B	A
Low	C	C	B

Table 2: Risk Categories

Risk Type	Risk Event	Likelihood	Impact	Category	Mitigation
Technical	Team is unfamiliar with project technologies such as Ethereum, Solidity and NodeJS.	Medium	Medium	B	Team members will research and share the knowledge learnt as well as consult our supervisor and sponsors.
Client Management	There may be drastic changes in the business requirements as our project is exploring uncharted territories.	Medium	High	A	Team members will meet up with project sponsors fortnightly to get updates on business requirements.
Project Management	The development pace of the project might be hastened to meet investors' expectations.	Low	High	B	Project will proceed as planned but team members will be ready to shorten each iteration and increase the pace of the project if required.

Table 3: Risk Management Plan

2.3 Resources and References:

We will be researching on how to deploy smart contracts on the Ethereum blockchain, through all available Ethereum deployment resources and Professor Paul Griffin's guide on private blockchains. Additionally, we will bolster our knowledge of the LNG industry by reading the books listed below. The following also details the technologies used for the entire course of this project.

Books: LNG industry in Transition: The Great Reconfiguration, Fundamentals of Investing in Oil and Gas, LNG: A Non-Technical Guide

Deployment Server: Digital Ocean (IaaS)

Technologies/ Libraries/ Frameworks: Ethereum, Node, Mocha, Truffle, Express, Rails

Programming Language(s): Solidity, JavaScript, Ruby, Bash

Software and Tool(s): Remix Solidity IDE, GitHub, Asana, Slack

Database: MySQL