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INTERNATIONAL JASIN MULTIMEDIA & COMPUTER SCIENCE
INVENTION AND INNOVATION EXHIBITION (I-JaMCSIIx) 2023

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Table of Contents

Registration ID	Project Title	Page
JM003	Deep Learning Model for 5W (What, When, Where, Who, and Why) Sign Language Translation System	1
JM005	Ramadhan Prep: A Mobile Application in Preparing for the Bigger Season of the Year	2
JM006	BTF Cake Recommender and Management System by using Rule Based	3
JM007	ALIMS - Assets Loan and Inventory Management with SMS Notification	4
JM008	IJH – Immediate Job Hiring System for Part-Timers with Location-Based	5
JM009	CRC – Clothing Review Classification using Sentiment Analysis	6
JM010	Web-Based Safety Helmet Detection System for Construction Site Worker	7
JM011	A Mobile Application System for Parking Validation Based on Deep Learning Image Processing	8
JM012	DEPsy Model	9
JM013	The Use of Computer Diagnostic Apps to Assist Computer Troubleshooting	10
JM014	Quantitative Spasticity Assessment Model of Neurological Disorder Patients	11
JM015	HELPIE: Stress Consoling App	12
JM016	SmartER: Smart English Reader	13
JM017	Synergistic Cyber Security Awareness Model for the Elderly (SCSAM-Elderly)	14
JM018	Kusoke Adventures: Recycling Interactive Game	15
JM019	Rider Parking Guidance using Location-Based Services and Crowdsourcing	16
JM020	PANTAU: Smart Intruder Detection from Video Surveillance Using Deep Learning	17
JM022	Plastopoll: A Serious Game to Raise Awareness About Plastic Pollution	18
JM023	Enhanced Car Park Security Through an Automatic Plate Number Recognition (APNR) System Featuring QR Code Generation	19

JM025	Group Assignment Management System (GAMS)	20
JM026	Proactive Safety Culture Application (PROSCA) Using Geolocation	21
JM027	Flood Wise: Mobile Virtual Reality for Flood Preparation Awareness	22
JM028	Recommendation System of Sports Centre in Malaysia Using Content Based Filtering	23
JM029	Twitter Sentiment Analysis of Malaysian Fast Food Restaurant Chains: A Novel Approach to Understand Customer Perception using Naïve Bayes	24
JM030	ARTventure: Learning Malay Traditional Dance Through Augmented Reality	25
JM031	ExpenseEase - Living Expenses Management Mobile Application	26
JM032	Drowsiness Detection and Alert System Using Face Recognition with Raspberry Pi	27
JM033	Web Application of Facial Emotion Recognition in Classroom Learning Environment with Raspberry Pi 4	28
JM034	HexaBingo MathQuest	29
JM035	Development of mobile app: Funeral services system (FSS)	30
JM036	Development of Mobile Application: Digital Mutawwif	31
JM037	Assessment Marks Management System: A Excel VBA Approach	32
JM038	Design and Fabrication of a Potato Peeling Machine	33
JM040	Donatenow: A Crowdsourcing-Based Mobile Application with Geolocation and Content-Based Filtering Algorithm	34
JM041	TextCrunch	35
JM042	Enhancing College Laundry Management System Through Web-Based Queueing Technique	36
JM043	Cyber Security Fun Race	37
JM044	Food Intake Monitoring and Management System for Athletes	38
JM046	A Game-Based Learning on Food Nutrition for Children	39
JM047	Innovative Video on Compound Interest	40
JM048	Detection of the Spread Covid-19 in Indonesia using K-Means Clustering Algorithm	41
JM049	Forecasting Inflation Rate in Malaysia Using Artificial Neural Network (Ann) Approach	42

JM050	Factors Affecting the House Price Among Kuala Lumpur, Selangor and Johor	43
JM051	Oxygen Hydrogen Generator (HHO Generator)	44
JM052	IoT-based Water Quality Monitoring System for Goldfish	45
JM053	KIT PRO-TAJ (Professional tajwid)	46
JM054	A Framework Of Procurement Analytics For Fraud Coalition Prediction	47
JM055	Exploring Classical Chinese Poetry with AI Tool in PPT Design	48
JM056	Developing Emergency Application for LRT Passengers with Decision Tree Algorithm (RailAlert!)	49
JM057	LetsGoFit: Gamified Mobile Health Application	50
JM058	Tools for Critical Thinking in IT	51
JM059	Sheep Tracker via Radio Frequency Identification (RFID) System	52
JM060	Developing an Application for Handyman Services Platform Using Geofencing and Content-based Filtering (Handy2Help)	53
JM061	Modeling Cases of Stunting Toddler in Indonesia using the Conway Maxwell Poisson Regression Method	54
JM063	Clustering Regencies/Cities in Central Sulawesi Province Based on Poverty Level Using the Average Linkage Method with Principal Component Analysis (PCA)	55
JM064	An Application for Vehicle Rental Service Advertising Using Geofence With Content-Based Filtering (ReadyVehicle)	56
JM065	MYB40: FINGERTECH B40 DISCOUNT CARD	57
JM066	Horticulture Land: Guide to Being A Plantsman Through Green Game	58
JM067	IMFLOODVR : An Immersive Virtual Reality Serious Game for Flood Risk Mitigation Awareness	59
JM068	Tomoe : Topic Modelling Web Application	60
JM069	ROVIGA: Model-Based Capacitive Soil Moisture Sensor for IoT-Based Plant Pot	61
JM070	Classification and Visualization on Eligibility Rate of Applicant's LinkedIn Account Using Naïve Bayes	62
JM071	Forecasting the Number of Schistosomiasis Cases (Snail Fever) in Napu, Central Sulawesi, Using the Auto Regressive Integrated Moving Avarege (ARIMA) Method	63
JM072	Delivera Flow	64

JM073	PeerLoom: Peer-to-Peer Skill Exchange Platform for University Students	65
JM074	Forecasting the Open Unemployment Rate in Central Sulawesi Province Using the Autoregressive Integrated Moving Average (ARIMA) Method	66
JM075	Pre-Parent Test as an Effort to See Adults Readiness to Become Parents Based on Web	67
JM076	The Development of Edu-Fertiblox Digital Game Using Roblox as ABM in The Topic of Fertigation Systems for The Subject of Design and Technology Level 1	68
JM077	SPARK C++: Bridging Concepts with Analogies, Multimedia, and Interactive Quizzes	69
JM078	PLC-Based Water Filling Machine Simulator for Teaching and Learning Activities	70
JM079	HANA'S Map	71
JM080	Classification and Visualization of E-Commerce Product Reviews Comparison Using Support Vector Machine	72
JM081	Futech.Edu (Future Technology Education): Teaching and Learning Application Design in The Society 5.0 Era	73
JM082	Checkers Match Game	74
JM083	SafeDrop: Intelligent Secure Parcel Locker	75
JM084	Gamification in English for Report Writing: Engaging Learning through Webinars	76
JM085	Iffah's Busy Board (IBB)	77
JM086	3R Bag	78
JM087	'CHICK VS VIRUS', A Game-Based Learning Approach in Teaching Students	79
JM088	MyIGCSE-Time: STEM IGCSE for Students	80
JM089	Kad 'Kat Mana Tu?'	81
JM090	Learning Project Formulation using Gamification Approach	82
JM091	Hoopla Pocket Location Aware Mobile Application with Augmented Reality	83
JM092	Mini Blossom Fan: A Practical Approach to Workspace Comfort	84
JM093	Cyberforce: A Cybersecurity Fps-Based Game	85
JM094	An IoT-based Instrument for Free Fall Motion	86

A Framework of Procurement Analytics for Fraud Coalition Prediction

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Abstract— The field of data analytics has become a significant catalyst for change in government operations, presenting unique possibilities for enhancing governance efficiency. The availability of vast amounts of data accessible to individuals responsible for making decisions presents an opportunity for extracting valuable insights. However, effectively harnessing this potential requires the utilisation of advanced methodologies. Data analytics has the potential to greatly benefit procurement, which is a crucial aspect of government operations. By utilising data analytics, procurement can improve its efficiency, mitigate disputes, prevent instances of fraud and corruption, enhance transparency and accountability, and reduce both time and cost burdens. The significance of effective procurement management is underscored by Malaysia's budget allocation of RM388.1 billion for the year 2023. Insufficient monitoring of procurement procedures can give rise to fraudulent activities, corrupt practises, and suboptimal tenderer choices, thereby causing significant financial losses to government funds. A misdemeanor arrest of the government procurement cartel coalition in 2021, which involved a monopoly of 345 tenders in government ministries and agencies across the nation and a project value of RM3.8 billion is one illustration of the insufficient monitoring of the fraudulent cartel and coalition activities in government procurement process. In order to tackle these issues, this study introduces a novel framework that employs a machine learning model specifically developed to assist evaluation committees and tender board in detecting fraudulent company in the tenders and quotations. The framework demonstrates the capability to predict tenderers who possess a likelihood of engaging in fraudulent activities and forming cartel coalition with other tenderers. Comprehensive information pertaining to tenderers can be discerned, hence bolstering the evidentiary support for the presence of fraudulent alliances and cartels among tenderers. This framework additionally offers visual analytics that facilitates the awareness of committee members and tender boards regarding the potential danger of fraudulent activities by tenderers during the procurement process. The framework described in this study utilises historical and current datasets derived from Malaysia's eProcurement system that is known as ePerolehan that was exist since 1999. This framework effectively extracts patterns, identifies trends, and generates forecasts pertaining to fraudulent coalition and cartel activities among tenderers. To date, there is an absence of technologies available for the detection of fraudulent coalitions and cartels in the procurement process. By implementing this framework, it has the potential to mitigate financial losses and corrupt practises, hence fostering economic growth and enhancing transparency within a nation.

Keywords—Procurement, Cartel, Fraudulent, Coalition, Machine Learning, Analytics



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