A COMMON TRANSACTIONAL ARCHITECTURE FOR MICROSERVICES WITH OPEN API SPECIFICATION

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Degree of Master of Science

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DECLARATION

I declare that this is my own work, and this dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Masters dissertation under my supervision.

Name of the supervisor: Prof. Indika Perera

Signature of the supervisor: Date 27/07/2023

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ABSTRACT

The domain of Information Systems (IS) is no longer isolated in modern world, with the high-speed network facilities more applications and sub systems such as management, EDI, CRM are being developed which access different independent sources inside and outside the organization. Nowadays, the microservice architecture is widely utilized in the development industry for creating larger and more intricate applications. A good microservice architecture helps to maintain the interoperability between different Opcos by reducing the cost of interconnectivity.

The existing gap in the telecom industry is not having a common standard set of APIs when designing their internal systems which leads to more labor cost and time consuming when integrating them with existing vendors or systems. Telecommunication companies have already identified the importance of having common API sets in their systems. Due to the complexity of those APIs, it will be difficult in catering existing requirements.

Several studies have been carried out on similar areas such as blockchain management, e-government portals and event driven architectures on designing an interoperable architecture for dynamic business models. However, most of them are analyzed in architectural level but not in microservice or API level with compatible data model and none of them have shown promising results.

This research attempts to explore the importance of an interoperable transaction architecture for microservices by analyzing TM Forum open API specification architecture along with its data model. It lends to propose a microservice based reference implementation and a reference architecture for community wide domains.

Key words: TMF, Microservices, API

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LIST OF ABBREVIATIONS

Abbreviation	Description
3GPP	3rd Generation Partnership Project
API	Application Programming Interface
BSS	Business Support Systems
CBS	Customer Billing System
CCRM	Customer - Centric Relationship Management
CDR	Call Detail Record
CRM	Customer Relationship Management
CRUD	Create, Read, Update, Delete
DBMS	Database Management System
GCP	Google Cloud Platform
HTTP	HyperText Transfer Protocol
JSON	JavaScript Object Notation
JVM	Java Virtual Machine
KPI	Key Performance Indicator
LTE	Long Term Evaluation
OCCI	Open Cloud Computing Interface
ONAP	Open Network Automation Platform
PHP	Hypertext Preprocessor
PID	Project Initiation Document
REST	Representational State Transfer
SOAP	Simple Object Access Protocol
SMSC	SMS Centre
SNMP	Simple Network Management Protocol
TRC	Telecommunications Regulatory Commission
XML	Extensible Markup Language
WSDL	Web Service Definition Language
URI	Uniform Resource Identifier

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