ATENEO DE MANILA UNIVERSITY
SCHOOL OF SCIENCE AND ENGINEERING

Tirian Trains

Project Deliverable 1
CSCI 41: Information Management

Submitted by:

Team USA, Group 14

Abdiel M. Evangelista
Alana Cate Y. Choachuy
Mikael Cholo C. Quintos
Kyle Joshua A. Ozo
Tristan Elvis Y. Tan

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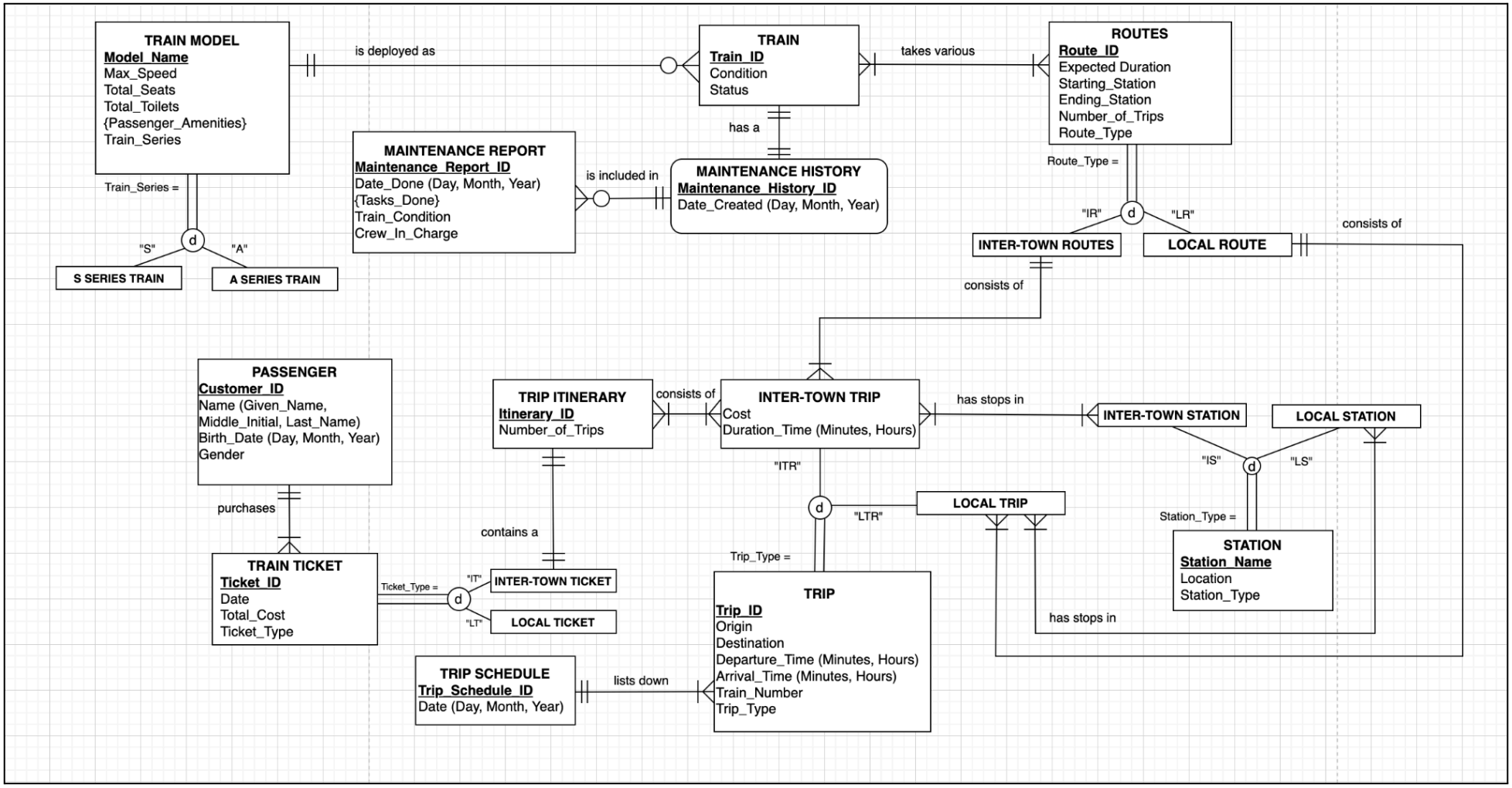
I. Description of the System

The Tirian Train System is a system designed to manage multiple aspects of its trains within Narnia including operation, maintenance, scheduling, and ticketing. It is able to track key details about each train such as the condition, routes, and history of maintenance while at the same time managing the schedule for local and inter-town routes. It is also able to record passenger and ticket purchase information.

The system also functions on multiple assumptions, limitations, and restrictions such as the fact that all trains of the same model share identical layouts, configurations, and characteristics. It is also noted that the Train Model entity includes active, out-of-service, and pre-production models, while the Train entity contains both active and out-of-service trains. Another thing to note is that new trains may not have a maintenance history yet. But for those that already have maintenance routines in their maintenance history, multiple tasks can be recorded in a single maintenance routine, with the name of the crew leader being made to represent the entire crew. Apart from this, it is also noteworthy to mention that the Route entity represents specific routes taken by a train at a given time, and trains may take multiple routes in order to maximize efficiency. A train may take a different one after finishing a specific route. The Trip entity, on the other hand, details the journey of a train from one station to another. There is also the fact that only the inter-town trips have a cost and duration attribute, as local trips have a fixed cost and will always take 5 minutes. Lastly, only inter-town train tickets have a trip itinerary because local tickets allow for any origin and destination and a trip itinerary may require having a passenger ride multiple different trains in order to get to their final destination because different trains have different routes.

II. Conceptual Data Model



III. Data Dictionary

DATA DICTIONARY

System Title: Tirian Trains EERD Date: September 18, 2024

Analyzed by: Group 14 - Team USA

Entity / Relationship Name	Train
Entity / Relationship Description	All the actual train instances of Tirian Trains that are currently being used.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Train_ID	The unique identifier that identifies each train.	Y	000000	451621, 317529	N
Condition	The current service condition of the train that gauges its functionality.	N	Excellent	Excellent, Very Good, Pristine, Poor	N
Status	The status of the train, if it is currently in service or not.	N	Active	Active, Inactive	N

Entity / Relationship Name	Maintenance History
Entity / Relationship Description	The log of a train that keeps track of all the maintenance routines done on it.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?

Maintenance_History_ID	The unique identifier that identifies the maintenance history for each train.	Y	M-000000	M-451621, M-317529	N
Date_Created(Day, Month, Year)	The date that the train becomes active and can already have maintenance routines. Also the date the maintenance log is created.	N	01/01/2010	04/04/2019, 21/06/2020	N

Entity / Relationship Name	Maintenance Report
Entity / Relationship Description	The maintenance report that is filed after every maintenance routine done on a train.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Maintenance_Report_ID	The unique identifier that identifies each report.	Y	X000000	C142382, O194815,	N
Date_Done(Day, Month, Year)	The date when the maintenance routine was done.	N	02/01/2010	03/8/2022, 11/9/2021, 15/9/2018	N
{Tasks_Done}	The list of all tasks done in the train.	N	Routine Check	Cleaning, Complete oil change	N
Train_Condition	The condition of the train after the maintenance routine.	N	Excellent	Poor, Very Good, Pristine	N

Crew_In_Charge	The crew in charge of doing the maintenance routine. Represented by the crew leader.	N	J. Smith	B. Ramoh, N. Khitsu, C. Itson	N

Entity / Relationship Name	Train Model
Entity / Relationship Description	All the train models of Tirian Trains that are currently being used, are phased out and plan to be used.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Model_Name	The specific name of the train model.	Y	X-000	S-393, A-265	N
Max_Speed	The train model's highest possible speed in kilometers per hour.	N	120 kph	120 kph, 100 kph, 200 kph	N
Total_Seats	The total number of seats in the train model.	N	70	70, 200, 300	N
Total_Toilets	The total number of toilets in the train model.	N	1	7, 15, 4	N
{Passenger_Amenities}	A multi-valued attribute listing down all the amenities passengers can enjoy in the train model.	N	Null	Reclining Seats, Folding Tables, Food Service	Y
Train_Series	The series of the train model. S for local trains and A for inter-town trains.	N	X	S, A	N

Entity / Relationship Name	A-Series Train
Entity / Relationship Description	The type of train for inter-town trains.

Entity / Relationship Name	S-Series Train
Entity / Relationship Description	The type of train for local trains.

Entity / Relationship Name	Routes
Entity / Relationship Description	A planned sequence of trips that a train will take at a given time. For example, a train's route could be from Cauldron Pool to Anvard which consists of three different trips.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Route_ID	The unique identifier for a specific route.	Y	XXXX-000	BDLP-162, WCCP-017	N
Expected Duration(Minute, Hour)	The expected overall time it takes for the train to finish the route.	N	0 hr 00 min	8 hr 07 min, 6 hr 30 min	N
Starting_Station	The starting station of the route.	N	XXXX	Beaver's Dam, Dancing Lawn	N
Ending_Station	The ending station of the route.	N	XXXX	The Lamp Post, Anvard	N
Number_of_Trips	Number of trips the route will take.	N	0	83, 121, 43	N

Route_Type	The scope of the route. Can either be local or inter-town.	N	XX	IR, LR	N

Entity / Relationship Name	Local Route
Entity / Relationship Description	A route within the Western Woods' stations.

Entity / Relationship Name	Inter-Town Route
Entity / Relationship Description	A route between towns in Narnia.

Entity / Relationship Name	Trip
Entity / Relationship Description	A singular instance of a train's move from one station to another.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Trip_ID	A unique identifier assigned to each trip.	Y	XXXXX-00000	KSJAN-16237, HWYSN-91827	N
Origin	The starting location of the trip.	N	XXXX	Allies' Enclave, Cauldron Pool	N
Destination	The destination location of the trip.	N	XXXX	Cauldron Pool, The Wardrobe	N
Departure_Time	The time when the	N	00:00	08:39,	N

(Minute, Hour)	train departs from the origin.			18:20	
Arrival_Time (Minute, Hour	The time the train arrives at the destination.	N	00:00	09:55, 23:01	N
Train_Number	Another unique identifier for a specific train that is visible to the passengers.	N	00000	12345, 67890	N
Trip_Type	The type of trip.”LTR” for Local Trips and “ITR” for Inter-town Trips.	N	XXX	LTR, ITR	N

Entity / Relationship Name	Local Trip
Entity / Relationship Description	A single trip within the Western Woods’ stations.

Entity / Relationship Name	Inter-Town Trip
Entity / Relationship Description	A single trip within towns in Narnia.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Cost	The travel cost for the trip in Lion Coins.	N	0 Lion Coins	9 Lion Coins, 18 Lion Coins	N
Duration_Time(Minute, Hour)	The time it takes for the train to arrive at	N	0 hr 00 min	2 hr 12 min, 1 hr	N

	the destination from the origin.			49 min	

Entity / Relationship Name	Trip Schedule
Entity / Relationship Description	The list of train trips for the entire day.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Trip_Schedule_ID	A unique identifier for the trip schedule	Y	XXXXX	21341, 19381	N
Date(Day, Month, Year)	Date the trip schedule was used.	N	01/01/2010	16/09/2024, 06/02/2023	N

Entity / Relationship Name	Station
Entity / Relationship Description	All the stations servicing Tirian Trains.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Station_Name	The name of the station.	Y	XXXX	Beaver's Dam Station, Father Christmas Station	N
Location	The location of the station.	N	XXXX	Beaver's Dam, Father	N

				Christmas	
Station_Type	The type of station. ”LS” for Local Stations and “IS” for Inter-town Stations.	N	XX	IS, LS	N

Entity / Relationship Name	Inter-Town Station
Entity / Relationship Description	Stations within Western Woods.

Entity / Relationship Name	Local Station
Entity / Relationship Description	Stations within towns of Narnia.

Entity / Relationship Name	Trip Itinerary
Entity / Relationship Description	The list of trips taken for the train ticket.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Itinerary_ID	The unique identifier that identifies each trip.	Y	XXXX0000	AECP4072, CTDL0393	N
Number_of_Trips	The number of trips taken for the entire ticket.	N	0	2, 4	N

Entity / Relationship Name	Train Ticket
Entity / Relationship Description	The train ticket purchased by a passenger for a series of trips to get to a destination.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Ticket_ID	The unique identifier of the ticket.	Y	XX000000	AE8192130, CP1723492	N
Date(Day, Month Year)	The date of the train rides.	N	01/01/2010	05/02/2021, 24/11/2019	N
Total_Cost	The total cost of the ticket. For local tickets, this is always 5 Lion Coins. For inter-town tickets, this is the total cost of all the trips in the itinerary combined.	N	0 Lion Coins	26 Lion Coins, 35 Lion Coins, 5 Lion Coins	N
Ticket_Type	The ticket type of the train ticket. “I” for Inter-Town trips and “L” for Local trips.	N	XX	IT, LT	N

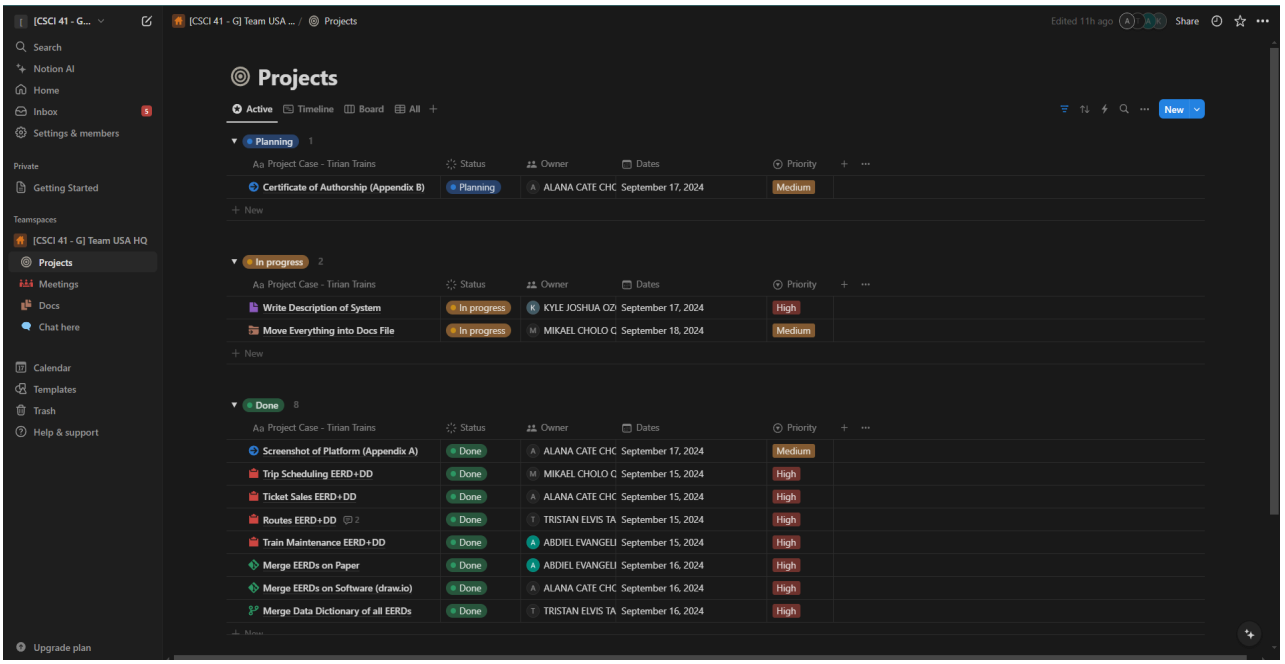
Entity / Relationship Name	Inter-Town Ticket
Entity / Relationship Description	The train ticket for the inter-town routes

Entity / Relationship Name	Local Ticket
Entity / Relationship Description	The train ticket for the local routes

Entity / Relationship Name	Passenger
Entity / Relationship Description	This represents each customer that purchases a train ticket.

Attribute Name	Description	Primary Key?	Default Value	Possible Values	Can be Null?
Customer_ID	The unique identifier of the train passenger in the database.	Y	XX-817238 42	AE-18237 41, TT-172631 8	N
Name(Given_Name, Middle_Initial, Last_Name)	The complete name of the passenger.	N	XXXX	Adam K. Grove, Juan Y. Dela Cruz, John B. Smith	N
Birth_Date(Day, Month, Year)	The birth date of a passenger.	N	01/01/2000	02/02/20 02, 15/05/20 06	N
Gender	The gender of the passenger.	N	X	Male, Female	N

APPENDIX A



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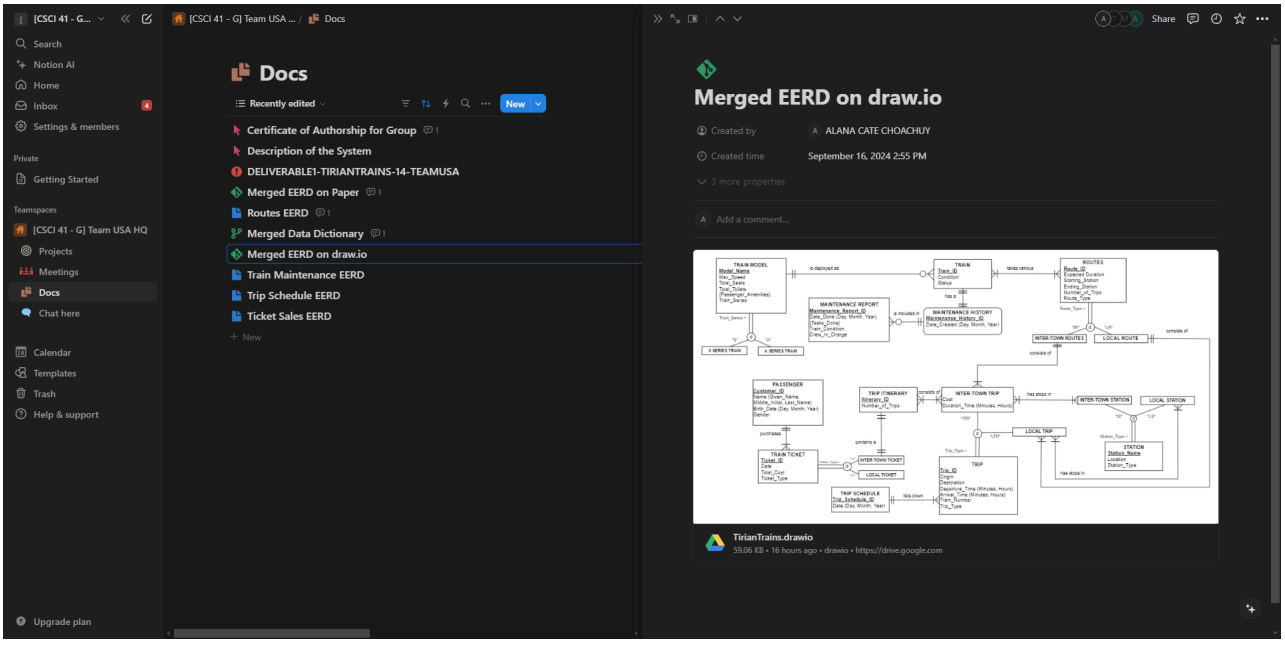

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APPENDIX B

Ateneo de Manila University
Department of Information Systems and Computer Science

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Date of Submission: September 18, 2024

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Group Information

Full Name	Signature
Alana Choachuy	
Abdiel Evangelista	
Tristan Tan	
Mikael Quintos	
Kyle Ozo	

Course Code & Section CSCI 41 - G
Course Title Information Management
Course Instructor Jessica Sugay, Shawn Co

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