ROCKBUSTER STEALTH LLC

DATA DICTIONARY

May, 2024

Vinh Dao

Contents

ACKNOWLEDGMENTS	i
STATEMENT OF CANDII	DATEii
ABSTRACT	iii
Contents	3
List of Tables	5
List of Figures	6
Introduction	1
	1
	1
J	1
	1
Background and Related W	ork2
	cking2
•	or physical activity tracking4
	ed, internet connected wearable activity tracking devices
	6
Wearable body motion detect	tor requirements9
	9
	9
3.2.1 ADuCM302	299
3.2.2 Wi-Fi Mod	ule (ESP8266)9
3.2.3 Detector ser	nsor (ADXL345)10
4 Methodology	11
	en sensor and microcontroller11
	11
_	ning environment12
	12
Conclusions and Future Wor	rk13
Appendix A	10
Appendix B	17
Defenences	12

List of Tables

Table 1 v	weekly Gant	: Chart	.21
-----------	-------------	---------	-----

List of Figures

Figure 1 Camera-based monitoring system []	9
Figure 2 comparison of input and output	10
Figure 3 shoe sketch map and hardware mounted on shoes	10
Figure 4 system structure	11
Figure 5 Interrupt processing	12
Figure 6 Flowchart of the operation by an overall program	14
Figure 7 Flowchart of the operation by an arm attachment body detection program	15
Figure 8 EVAL-ADICUP3029 diagram	17
Figure 9 SPI connection	19
Figure 10 SPI sequence chart	19

ERD – Entity Relationship Diagram

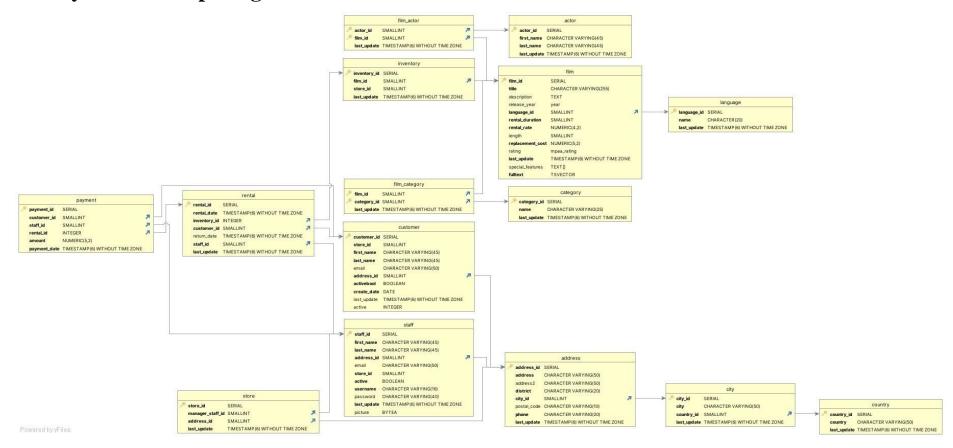


Figure 1: Project ERD

Data dictionary

Fact

Rental

Table 1:Rental

Columns	Data Type	Description
rental_id (PK)	SERIAL / INTEGER	Unique ID of a rental
rental_date	TIMESTAMP(6) WITHOUT TIME ZONE	Date of rental
inventory_id (FK)	INTEGER	Unique ID of an inventory (each film in each store)
customer_id (FK)	SMALLINT	Unique ID of a customer
return_date	TIMESTAMP(6) WITHOUT TIME ZONE	Date of rental return
staff_id (FK)	SMALLINT	Unique ID of employee
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	inventory customer staff	rental.inventory_id = inventory.inventory_id rental.customer_id = customer.customer_id rental.staff_id = staff.staff_id
Links from	payment	payment.rental_id = rental.rental_id

Payment

Table 2: Payment

Columns	Data Type	Description
payment_id (PK)	SERIAL / INTEGER	Unique of a payment
customer_id (FK)	SMALLINT	Unique ID of a customer
staff_id (FK)	SMALLINT	Unique ID of employee
rental_id (FK)	SERIAL	Unique ID of a rental
amount	NUMERIC	Amount paid
payment_date	TIMESTAMP(6) WITHOUT TIME ZONE	Date of payment

		Unique keys
Links to	customer staff rental	payment.customer_id = customer.customer_id payment.staff_id = staff.staff_id payment.rental_id = rental.rental_id
Links from	-	

Dimension tables:

Inventory

Table 3: Inventory

Columns	Data Type	Description
inventory_id (PK)	SERIAL / INTEGER	Unique ID of an inventory (each film in each store)
film_id (FK)	SMALLINT	Unique ID of a movie
store_id	SMALLINT	Unique ID of a store
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	film	inventory.film_id = film.film_id
Links from	rental	rental.inventory_id = inventory.inventory_id

Customer

Table 4: Customer

Columns	Data Type	Description
customer_id (PK)	SERIAL / INTEGER	Unique ID of a CUSTOMER
store_id	SMALLINT	Unique ID of a store
first_name	CHARACTER VARYING(45)	Customer's first name
last_name	CHARACTER VARYING(45)	Customer's last name
email	CHARACTER VARYING(50)	Customer's email address
address_id (FK)	SMALLINT	Customer's address ID
activebool	BOOLEAN	Boolean field for customer's activity status
create_date	DATE	Customer's account creation date
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record
active	INTEGER	0-1 field for customer's activity status

		Unique keys
Links to	address	customer.address_id = address.address_id
Links from	payment rental	payment.customer_id = customer.customer_id rental.customer_id = customer.customer_id

Staff

Table 5: Staff

Columns	Data Type	Description
staff_id (PK)	SERIAL / SMALLINT	Unique ID of employee
first_name	CHARACTER VARYING(45)	Employee's first name
last_name	CHARACTER VARYING(45)	Employee's last name
address_id (FK)	SMALLINT	Employee's address ID
email	CHARACTER VARYING(50)	Employee's email address
store_id	SMALLINT	Unique ID of a store
active	BOOLEAN	Boolean field for employee's activity status
username	CHARACTER VARYING(16)	Employee's username
password	CHARACTER VARYING(40)	Employee's password
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record
picture	BYTEA	Employee's picture

		Unique keys
Links to	address	staff.address_id = address.address_id
Links from	payment rental store	payment.staff_id = staff.staff_id rental.staff_id = staff.staff_id store.staff_id= staff.staff_id

Actor

Table 6: Actor

Columns	Data Type	Description
actor_id (PK)	SERIAL / INTEGER	Unique actor's ID
first_name	CHARACTER VARYING(45)	Actor's first name
last_name	CHARACTER VARYING(45)	Actor's last name
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	-	-
Links from	film_actor	film_actor.actor_id = actor.actor_id

Film

Table 7: Film

Columns	Data Type	Description
film_id (PK)	SERIAL / INTEGER	Unique ID of a movie
title	CHARACTER VARYING(255)	Movie title
description	TEXT	Film description
release_year	INTEGER	Release year of a movie
language_id (FK)	SMALLINT	Film language ID
rental_duration	SMALLINT	Duration of rental in days
rental_rate	NUMERIC(4,2)	Costs of film rental
length	SMALLINT	Film length in minutes
replacement_cost	NUMERIC(5,2)	Film replacement costs
rating	mpaa_rating	Rating of film's suitability for certain audiences based on its content
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record
special_features	TEXT[]	Extra content description
fulltext	TSVECTOR	Lexems optimized for querying the film associations

		Unique keys
Links to	language	film.language_id = language.language_id
Links from	film_actor inventory film_category	film_actor.film_id = film.film_id inventory.film_id = film.film_id film_category.film_id = film.film_id

$film_actor$

Table 8: film_actor

Columns	Data Type	Description
actor_id (PK)	SMALLINT	Unique actor's ID
film_id (PK)	SMALLINT	Unique ID of a movie
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	actor film	film_actor.actor_id = actor.actor_id film_actor.film_id = film.film_id
Links from	-	-

Film_category

Table 9: Film_category

Columns	Data Type	Description
film_id (PK)	SMALLINT	Unique ID of a movie
category_id (PK)	SMALLINT	Film category ID
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	film category	film_category.film_id = film.film_id film_category.category_id = category.category_id
Links from	-	-

Language

Table 10: Language

Columns	Data Type	Description
language_id (PK)	SERIAL / SMALLINT	Film language ID
name	CHARACTER(20)	Language name
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	-	-
Links from	film	film.language_id = language.language_id

Category

Table 11: Category

Columns	Data Type	Description
category_id (PK)	SERIAL / INTEGER	Film category ID
name	CHARACTER VARYING(25)	Film category
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	-	-
Links from	film_category	film_category.category_id = category.category_id

Store

Table 12: Store

Columns	Data Type	Description
store_id (PK)	SERIAL / INTEGER	Unique ID of a store
manager_staff_id (FK)	SMALLINT	Store's manager ID
address_id (FK)	SMALLINT	Store's address ID
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	staff address	store.manager_staff_id = staff.manager_staff_id store.address_id = address.address_id
Links from	-	ı

Address

Table 13: Address

Columns	Data Type	Description
address_id (PK)	SERIAL / INTEGER	Unique address ID
address	CHARACTER VARYING(50)	Address
address2	CHARACTER VARYING(50)	Address's second lane
district	CHARACTER VARYING(20)	Region name
city_id (FK)	SMALLINT	ID of a city
postal_code	CHARACTER VARYING(10)	Postal code
phone	CHARACTER VARYING(20)	Phone number
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	city	address.city_id = city.city_id
Links from	customer staff store	customer.address_id = address.address_id staff.address_id = address.address_id store.address_id = address.address_id

City

Table 14: City

Columns	Data Type	Description
city_id (PK)	SERIAL / SMALLINT	ID of a city
city	CHARACTER VARYING(50)	City name
country_id (FK)	SMALLINT	Country ID
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	country	city.country_id = country.country_id
Links from	address	address.city id = city.city id

Country

Table 15: Country

Columns	Data Type	Description
country_id (PK)	SERIAL / SMALLINT	Country ID
country	CHARACTER VARYING(50)	Country name
last_update	TIMESTAMP(6) WITHOUT TIME ZONE	Last update of the record

		Unique keys
Links to	-	-
Links from	city	city.country_id = country.country_id

Appendix A

Abbreviations

PK : primary key

FK : foreign key

References

- 1. Yamaguchi, Kenji, and Norimitsu Baba. "Body motion detector." U.S. Patent No. 7,034,694. 25 Apr. 2006.
- 2. Kubo, Nobuo, Kiichiro Miyata, and Hiromi Matsumoto. "Body motion detector." U.S. Patent No. 6,700,499. 2 Mar. 2004.
- 3. Asada, Yuji, and Masahiro Kitagawa. "Body motion detection device." U.S. Patent Application No. 13/184,139.
- 4. L. Suhuai and H. Qingmao, "A Dynamic Motion Pattern Analysis Approach to Fall Detection", IEEE International Workshop on Biomedical Circuits & Systems, BioCAS2004, pp. 2.1-5, 2004
- 5. Bamberg, Stacy J. Morris, et al. "Gait analysis using a shoe-integrated wireless sensor system." IEEE transactions on information technology in biomedicine 12.4 (2008): 413-423.
- 6. Bourgeois, A. Brégou, et al. "Spatio-temporal gait analysis in children with cerebral palsy using, foot-worn inertial sensors." Gait & posture 39.1 (2014): 436-442.
- 7. Macleod, Catherine A., et al. "Development and validation of a low-cost, portable and wireless gait assessment tool." *Medical engineering & physics* 36.4 (2014): 541-546.
- 8. Hadjidj, Abdelkrim, et al. "Wireless sensor networks for rehabilitation applications: Challenges and opportunities." Journal of Network and Computer Applications 36.1 (2013): 1-15.
- 9. Luo, Suhuai, and Qingmao Hu. "A dynamic motion pattern analysis approach to fall detection." Biomedical Circuits and Systems, 2004 IEEE International Workshop on. IEEE, 2004.
- 10. Sonka, Milan, Vaclav Hlavac, and Roger Boyle. Image processing, analysis, and machine vision. Cengage Learning, 2014.
- 11. Segen, Jakub. "A camera-based system for tracking people in real time." Proceedings of 13th International Conference on Pattern Recognition. Vol. 3. IEEE, 1996.