Project Step 2 Draft

Group 95: Mikasa Hackerman

Team: Eli Mills, Na Kim

Project Title: “Gametyme”

A) Fixes based on Feedback from Step 1

From the feedback that we received from our TA, our team was recommended to mention the use of foreign keys in our relationship descriptions of Entities as well as giving more details about implementation. We took our TA’s feedback and implemented these changes by adding more details to each of our Entity relationship descriptions. We added more details on the use of foreign keys as well as gave more details such as the use of an intersection table to better describe how each Entity is being implemented.

While addressing the points from the feedback received, we also made a few additional changes. We noticed that there was a naming inconsistency between our schema and our draft outline. Thus we changed the attribute company_location to location_id to maintain consistency. In addition, to normalize the tables to 3NF, two additional tables were added. The tables Locations and GamesPlatforms were added to make it easier to reference to the Platforms and Companies tables. Along with these changes, Companies and Platforms Entity relationship descriptions were updated to detail the use of foreign keys and implementation. The attribute location_id was updated to add foreign keys in both Companies and Platforms as well. While working on the schema, we also decided to update the ON DELETE requirements for all foreign keys in the following tables: Playthroughs, Sessions, Games, Companies, and Platforms.

B) Project Outline and Database Outline - Updated Version

Feedback by the peer reviewers:

First reviewer

Does the overview describe what problem is to be solved by a website with DB back end?

Yes, Gametyme is a database-driven website that is used to track the type of video games, hours played, and number of playthroughs. It is a very useful tool for competitive speedrunners who are trying to set fastest records for certain achievements in the game.

Does the overview list specific facts?

Yes it lists that the company, Gametyme has a large database of 1 million games and can support up to 500,000 users.

Are at least four entities described and does each one represent a single idea to be stored as a list?

Yes at least four entities exist in the schema including Users Games, Playthrough, Session, Genre, Company, and Platform. Each one represents a single idea to be stored as a list.

Does the outline of entity details describe the purpose of each, list attribute data types and constraints, and describe relationships between entities?

The outline of the entity does describe the purpose of each list, attribute, datatype and constraints and does describe the relationship between entities. Each entity provides the information that would be of interest. The M:M relationship between Games and Platforms will eventually need to be explained with an intersection table in a 1:M relationship**.** The diagram is well designed and color coded well.

Does the outline clearly indicate which entities (tables) will be implemented and which team member is primarily assigned to the associated page(s)?

The outline clearly indicates which entities will be implemented. It is not shown which team member is primarily assigned to the associated pages.

Are 1:M relationships correctly formulated? Is there at least one M:M relationship?

The 1:M relationships are correctly formulated. There is at least one M:M relationship. They are between 1: Users and Games and 2: Games and Platform. The intersection table between the User and Games M:M relationship in the diagram is the playthrough entity. However there is no intersection table for the M:M relationship between Games and Platform. It seems that the platform_id in Platforms should have been a FK in Games.

Is there consistency in a) naming between overview and entity/attributes b) entities plural, attributes singular c) use of capitalization for naming?

There is consistency in naming between overview and entity/attributes in the diagram. Entities are plural while attributes mostly in the singular. I suggest changing hours_played to time_played to maintain the singular. The use of capitalization is used for the entities but not for the attributes. However the outline has "Playthrough, Session, Genre, Company and Platform" written as the singular. This should be changed to plural to be consistent with the diagram.

Second reviewer

- Does the overview describe what problem is to be solved by a website with DB back end?
    - Yes, the overview does a really good job of describing what the problem is and how their solution solves it.
- Does the overview list specific facts?
    - Yes, they listed an approximate number of games in the world to help show the potential scope the db could grow to. They also mention what their db is able to handle.
- Are at least four entities described and does each one represent a single idea to be stored as a list?
    - Yes, there are at least 4 entities that all make sense as a single idea.
- Does the outline of entity details describe the purpose of each, list attribute data types and constraints and describe relationships between entities? Does the outline clearly indicate which entities (tables) will be implemented and which team member is primarily assigned to the associated page(s)?
    - Yes, the outline does a good job of describing each entity, its attributes and their data types, as well as the relationships between entities. The relationships are well described and easy to understand why the relationship is necessary.
- Are 1:M relationships correctly formulated? Is there at least one M:M relationship? Does the ERD present a logical view of the database?
    - The 1:M relationships appear to be correctly formulated, however I did notice that in the description, Games describes a M:M relationship with Users and vice versa, but I do not see the relationship being described in the ERD.
- Is there consistency in a) naming between overview and entity/attributes b) entities plural, attributes singular c) use of capitalization for naming?
    - The only issue I see is that the entities described in the overview are singular, and the entities in the ERD are plural, I would just make the overview plural to match your ERD.

By the way this is a super creative idea, and I think people would actually use this!

Great work.

Third reviewer

- Does the overview describe what problem is to be solved by a website with DB back end?
    - Yes, the overview does a good job describing a need for a DB back end solution to track video games that gamers have played and their progress for each game.
- Does the overview list specific facts?
    - Yes, the overview goes into depth in the scale of the fictitious company, with specific numbers. It does a good job of representing and presenting the DB methods a company that can use to provide analytic services for gamers. It clearly explains what the DB is meant to accomplish and what solution it will provide for Gametyme and its community of gamers.
- Are at least four entities described and does each one represent a single idea to be stored as a list?
    - Yes, more than four entities are outlined and each entity has an arguable reason to be outlined as an entity. Each entity relates to other entities and the attributes outlined for each seem relevant.
- Does the outline of entity details describe the purpose of each, list attribute data types and constraints and describe relationships between entities? Does the outline clearly indicate which entities (tables) will be implemented and which team member is primarily assigned to the associated page(s)?
    - Yes, the outline succinctly describes the purpose of each entity in a tidy description. Each attribute is shown and the outline clearly indicates which entities will be implemented. There are entities without many attributes that could potentially include more information. The relationships an entity has are also detailed explicitly for each entity. The outline does not specify which team member will be assigned to each page.
- Are 1:M relationships correctly formulated? Is there at least one M:M relationship? Does the ERD present a logical view of the database?
    - Yes, the many 1:M relationships are simple to follow and seem to make sense in the outline and diagram. There is one M:M relationship between platform and games between Platform and Games, which makes sense (however, no intersection table in the diagram). There is one M:M relationship between games and users that is not present in the diagram.
- Is there consistency in a) naming between overview and entity/attributes b) entities plural, attributes singular c) use of capitalization for naming?
    - Yes, there is consistency in the naming in the diagram, with plural tables/singular ids and a use of capitalization for names of Entities and

lowercase for attributes. The outline has the entity names in the singular, which is not consistent with the diagram.

Summary of Changes

Overall our team project received great feedback.The peer reviewers gave feedback that most of our draft consisted of detailed descriptions, correct attribute data types, and that our project overview described what the problem is to be solved with a DB back end clearly. While we got great feedback, there were a couple of helpful tips and constructive feedback that we received to better improve our project draft.

We received a total of 3 reviewers in which each reviewer brought their own perspectives and feedback. The first feedback we received was that in our database outline, we implemented a M:M relationship between Games and Platforms but did not include an intersection table. The peer reviewer recommended that we would eventually need to explain this M:M relationship with an intersection table in a 1:M relationship. In the draft outline, the reviewer also mentioned that we lacked a section including which team member would be assigned to an entity/page. In addition, the reviewer also suggested that we include platform_id from the entity, Platforms, as a FK in the Games entity. One of the final feedbacks that we got from the first reviewer was that there was an inconsistency in Entities being plural as some entities were singular along with one inconsistency with one attribute being plural instead of singular. Finally, the reviewer suggested we change the Sessions attribute “hours_played” to “time_played” to maintain consistency of attributes remaining singular.

The second reviewer gave similar feedback to the first peer reviewer. The reviewer noticed that there were inconsistencies in entities being plural and that a M:M relationship between Games and Users was not described in the ERD. The third reviewer gave feedback that was also similar to the two reviewers in that there were some inconsistencies with Entity names not being plural, a M:M relationship between platform and games not being depicted in the ERD, no intersection table in ERD for Games and Platforms, and our draft outline not specifying which team member would be assigned to which page. A new addition to the feedback that the third reviewer mentioned was that there were many entities without many attributes that could be improved on with more information.

Actions based on the feedback:

- We chose not to act on the feedback from the first reviewer about Games and Platforms not having an intersection table displayed in the ERD. This is due to the assignment description for Project Step 1 Draft stating that for this ERD, it is preferred that we leave intersection tables out.
- Based on the feedback from the first reviewer that we did not include information about which teammate would be assigned to which entity, we added a section to our writeup detailing which entities each team member would be responsible for.
- We chose not to act on the suggestion from the first reviewer to include a FK for Platforms within the Games entity. This is because Platforms and Games have a M:M relationship, so rather than storing one foreign key inside the other, their relationship will be facilitated through an intersection table containing FK's for both Games and Platforms.
- Based on the feedback from the first reviewer that our naming was inconsistent, we corrected the **Database Outline** to list entities as plural nouns to match the ERD.
- Based on the feedback from the first reviewer about changing the attribute "hours_played" to "time_played" from the Sessions Entity to maintain consistency in attributes being singular, we followed the reviewer's advice and switched the attribute to time_played.
- Based on the feedback from the second reviewer about Games and Users not showing a M:M relationship in the ERD, it was realized that it was misleading to refer to this relationship as M:M within the **Database Outline**. This is because, while there is technically a M:M relationship between these two entities, it is probably more accurate to talk about this in the context of the Playthrough entity, which is its own entity beyond a simple intersection table. Because of this, mention of a M:M relationship between Games and Users was omitted from the **Database Outline**.
- Based on the feedback from the third reviewer that some of our entities were lacking in attributes, we decided to add "company_location" to the Companies entity and "platform_make" to the Platforms entity.

Upgrades to the Draft version Step 1:

- Changed type of "time_played" in "Sessions" to DECIMAL(19,2) instead of FLOAT after learning about FLOAT's tendency to lose precision

Upgrades to the Draft version Step 2:

- Changed attribute name in “Companies” from company_location to location_id to maintain naming consistency between the schema and draft outline.
- Normalized tables to 3NF by creating two separate tables, GamesPlatforms and Locations, to easily reference Platforms and Companies entity tables.
- Added more details to Entity relationship descriptions to mention foreign key use and implementation details of the use of an intersection table.
- Through normalization to 3NF, GamesPlatforms and Locations tables were created.Location table was added to the draft outline along with data attributes and relationships. Through this addition, the Companies and Platforms relationships were updated to mention the implementation and foreign key usage details. The attribute location_id from Locations was updated to be a FK in both Companies and Platforms as well.
- Updated ON DELETE requirements for foreign keys in the following tables: Playthroughs, Sessions, Games, Companies, and Platforms.

Overview:

Gametyme is a database-driven website which provides gamers a platform to track the video games they have played along with their gameplay hours and number of playthroughs. There are over 5 million games in the world, many with their own competitive circles and dedicated fan bases in which tracking the number and duration of playthroughs can be just as important as the game itself!

Gametyme makes it easier for gamers to keep track of the games they play as well as how long each playthrough takes. Gametyme has a large database of 1 million videogames and can support up to 500,000 users. To use our platform, users can simply search for a video game and start a new playthrough. As they make progress on their playthroughs, users can then report their hours by logging new sessions.

For pro members, Gametyme can be used to generate charts, trends, and analytical insights into their performance, which can be especially useful for those in the competitive speedrunning community. Gametyme also aims to foster a supportive gaming community by allowing users to view other users’ lists and check out their stats!

Database Outline:

a) **Users**: Records the details of Users who have created an account and have logged in games & gameplay hours
   i) user_id: INT, auto_increment, unique, not NULL, PK
   ii) first_name: VARCHAR(45), not NULL
   iii) last_name: VARCHAR(45), not NULL
   iv) username: VARCHAR(45), not NULL
   v) email: VARCHAR(45), not NULL
   vi) **Relationship**:
      1) A 1:M relationship between Users and Playthroughs is implemented with user_id inside of Playthroughs. Users can log multiplePlaythroughs, and each Playthrough can only have one User.

b) **Games**: Records the details of games that users can track hours for or have played
   i) game_id: INT, auto_increment, unique, not NULL, PK
   ii) game_title: VARCHAR(100), not NULL
   iii) game_summary: VARCHAR(1000)
   iv) release_date: DATE
   v) company_id : INT, FK
   vi) genre_id: INT, FK
   vii) **Relationship**:
      1) A M:1 relationship between Games and Genres where genre_id from Genres is implemented as a FK in Games. Genres can have multiple Games, but Games will be limited to one Genre.
      2) A 1:M relationship between Games and Playthroughs is implemented with game_id inside of Playthroughs as a FK.
      3) A M:1 relationship between Games and Companies where company_id from Companies is implemented as a FK in Games. A Company can have produced multiple games, but a Game can only be produced by one Company
      4) A M:M relationship between Games and Platforms which is established through an intersection table named GamesPlatforms. GamesPlatforms will contain both game_id and platform_id as

foreign keys. Games are available on multiple Platforms, and many different games can be available on the same Platform.

c) **Playthroughs:** Created when a User starts a new Playthrough of a Game. Used to track which Games a User has played, when they've started and finished a Game, how many times they've played it, and how many hours they've played it (by summing Session lengths).
   i) playthrough_id: INT, auto_increment, unique, not NULL, PK
   ii) user_id: INT, FK
   iii) game_id: INT, FK
   iv) start_timestamp: TIMESTAMP, not NULL
   v) finish_timestamp: TIMESTAMP
   vi) **Relationships:**
      1) A M:1 relationship between Playthroughs and Users where user_id from Users is implemented as a FK in Playthroughs. Users can start multiple Playthroughs, but each Playthrough is only associated with one User.
      2) A M:1 relationship between Playthroughs and Games where game_id from Games is implemented as a FK in Playthroughs. There can be multiple Playthroughs for the same Game, but only one Game per Playthrough.
      3) A 1:M relationship between Playthroughs and Sessions where playthrough_id from Playthroughs is implemented as a FK in Sessions. A Playthrough can be divided across multiple Sessions, but each Session can only be for one Playthrough.

d) **Sessions**: Created whenever a User logs a new session for a particular Playthrough. Records the corresponding Playthrough, the number of hours played, and the date and time of the entry.
   i) session_id: INT, auto_increment, unique, not NULL, PK
   ii) playthrough_id: INT, FK, not NULL
   iii) time_played: DECIMAL(19,2)
   iv) session_timestamp: TIMESTAMP, not NULL
   v) **Relationship**:
      1) A M:1 relationship between Sessions and Playthroughs where playthrough_id from Playthroughs is a FK in Sessions. The M:1 relationship between Sessions and Playthroughs is implemented and established through an intersection table. Playthroughs can be divided into multiple Sessions, but each Session can only belong to one Playthrough.

e) **Genres**: Category entity listing possible genres for Games.
   i) genre_id: INT, auto_increment, unique, not NULL, PK
   ii) genre_name: VARCHAR(45), not NULL
   iii) **Relationship**:
      1) A 1:M relationship between Genres and Games. Games can only be one Genre, but the same Genre can be used for multiple Games.

f) **Companies**: Records the information about each game development studio.
   i) company_id: INT, auto_increment, unique, not NULL, PK
   ii) company_name: VARCHAR(100), not NULL
   iii) location_id: VARCHAR(45), FK
   iv) **Relationship**:
      1) A 1:M relationship between Companies and Games. A Company can produce multiple Games.
      2) A M:1 relationship between Companies and Locations where location_id from Locations is used as a FK in Companies. There are multiple game companies, but each company has one location for their headquarters.

g) **Platforms**: Category entity listing possible gaming platforms.
   i) platform_id: INT, auto_increment, unique, not NULL, PK
   ii) platform_name: VARCHAR(45), not NULL
   iii) location_id: VARCHAR(45), FK
   iv) **Relationship**:
      1) A M:M relationship between Platforms and Games which is established through an intersection table named GamesPlatforms. GamesPlatforms will contain both game_id and platform_id as foreign keys. Games can be on multiple platforms, and the same Platform can be associated with many different Games.
      2) A M:1 relationship between Companies and Locations where location_id from Locations is used as a FK in Companies. Multiple game companies can be in the same Location, but each Company can only have one Location for their headquarters.

h) **Locations**: Category entity listing the locations of game companies.
   i) location_id :INT, not NULL, AUTO INCREMENT, unique, PK
   ii) city: VARCHAR(45), not NULL
   iii) state: VARCHAR(45)

iv) country : VARCHAR(45), not NULL

v) **Relationship**:

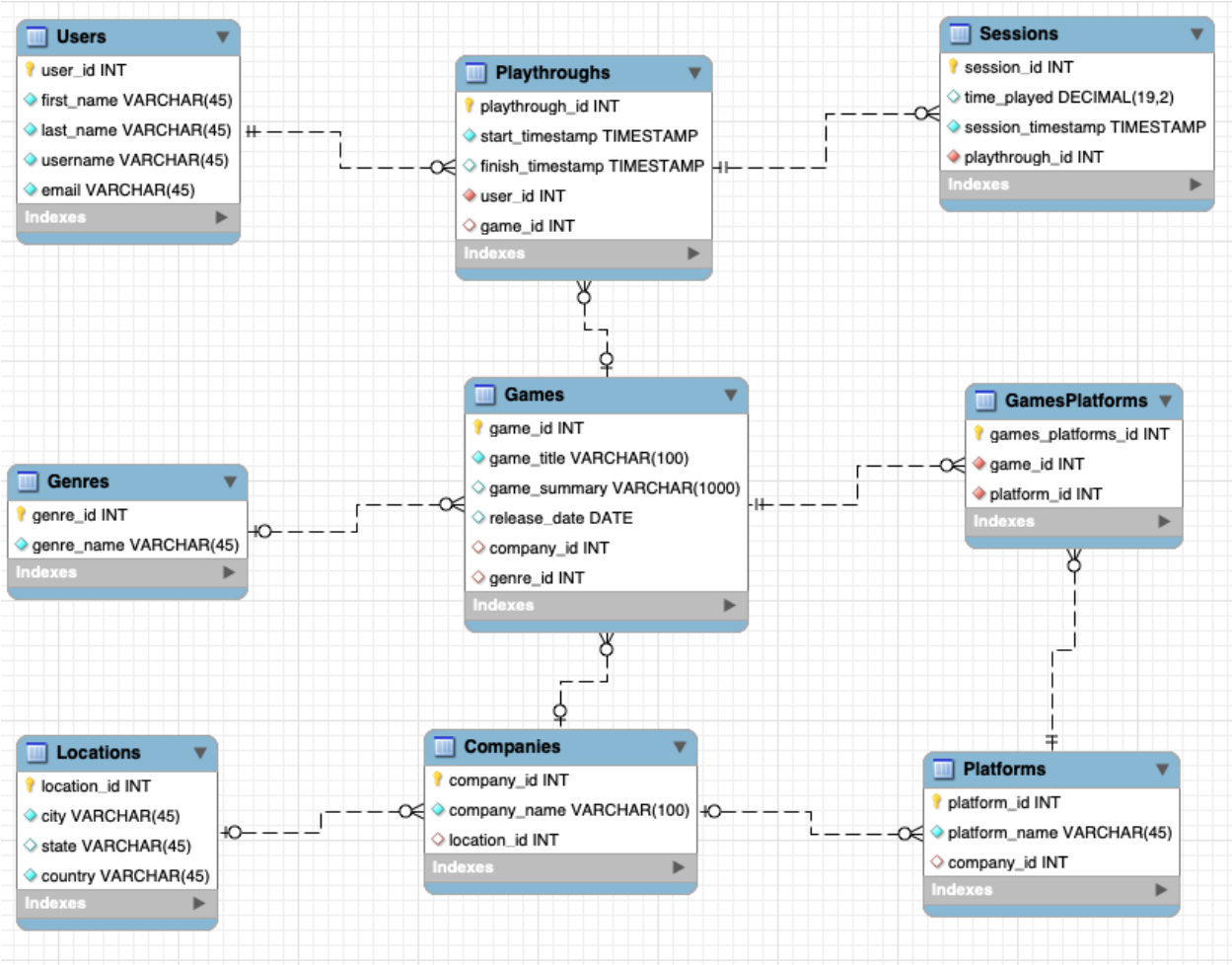
1) A 1:M relationship between Locations and Companies where location_id from Locations is used as a FK in Companies. There are multiple game companies, but each company has one location for their headquarters.

Entity Table Assignments:

- Eli Mills - Genres, Companies, Platforms, Locations
- Na Kim - Users, Games, Playthroughs, Sessions

C) Entity-Relationship Diagram

D) Schema


Users
user_id INT
first_name VARCHAR(45)
last_name VARCHAR(45)
username VARCHAR(45)
email VARCHAR(45)
Indexes
Playthroughs
playthrough_id INT
start_timestamp TIMESTAMP
finish_timestamp TIMESTAMP
user_id INT
game_id INT
Indexes
Sessions
session_id INT
time_played DECIMAL(19,2)
session_timestamp TIMESTAMP
playthrough_id INT
Indexes
Games
game_id INT
game_title VARCHAR(100)
game_summary VARCHAR(1000)
release_date DATE
company_id INT
genre_id INT
Indexes
GamesPlatforms
games_platforms_id INT
game_id INT
platform_id INT
Indexes
Genres
genre_id INT
genre_name VARCHAR(45)
Indexes
Locations
location_id INT
city VARCHAR(45)
state VARCHAR(45)
country VARCHAR(45)
Indexes
Companies
company_id INT
company_name VARCHAR(100)
location_id INT
Indexes
Platforms
platform_id INT
platform_name VARCHAR(45)
company_id INT
Indexes

E) Example Data

Users

user_id	first_name	last_name	username	email
1	Eren	Yeager	Titan	fightme@gmail.com
2	Mikasa	Ackerman	Erennn	ackerman@gmail.com
3	Link	Zelda	Korok	zelda@gmail.com

Games

game_id	game_title	game_summary	release_date	company_id	genre_id
1	Elden Ring	This is an open world dark souls like game where you also die a lot	2022-02-25	1	1
2	The Legend of Zelda: Breath of the Wild	This is an open world Zelda game where you hunt koroks	2017-03-03	2	2
3	Overwatch	This is a multiplayer shooting game where everyone needs healing too much	2016-05-24	3	3

Playthroughs

playthrough_id	start_timestamp	finish_timestamp	user_id	game_id
1	2022-01-04 02:15:01	2022-04-04 04:14:03	1	1
2	2021-11-01 01:30:40	2022-01-12 10:24:10	2	3
3	2020-05-20 04:20:32	2020-12-01 10:02:01	3	2

Sessions

session_id	time_played	session_timestamp	playthrough_id
1	10	2020-12-11 11:01:03	3
2	1	2022-02-01 02:02:13	2
3	5	2022-04-11 05:09:23	1

Genres

genre_id	genre_name
1	action
2	adventure
3	shooter

Companies

company_id	company_name	location_id
3	Blizzard	3
1	FromSoftware	1
5	Microsoft	4
2	Nintendo	2
4	Sony	1

Platforms

platform_id	platform_name	company_id
1	Switch	2
2	PC	5
3	Playstation 4	4
4	Playstation 5	4
5	Xbox One	5
6	Xbox Series X|S	5

Locations

location_id	city	state	country
1	Tokyo	NULL	Japan
2	Kyoto	NULL	Japan
3	Irvine	California	United States
4	Redmond	Washington	United States

GamesPlatforms

games_platforms_id	game_id	platform_id
1	1	2
2	1	3
3	1	4
4	1	5
5	1	6
6	2	1
7	3	1
8	3	2
9	3	3
10	3	5