

Indian Institute of Information Technology, Allahabad

Database Management System

Project No - 13

Group No -13

Group Members :

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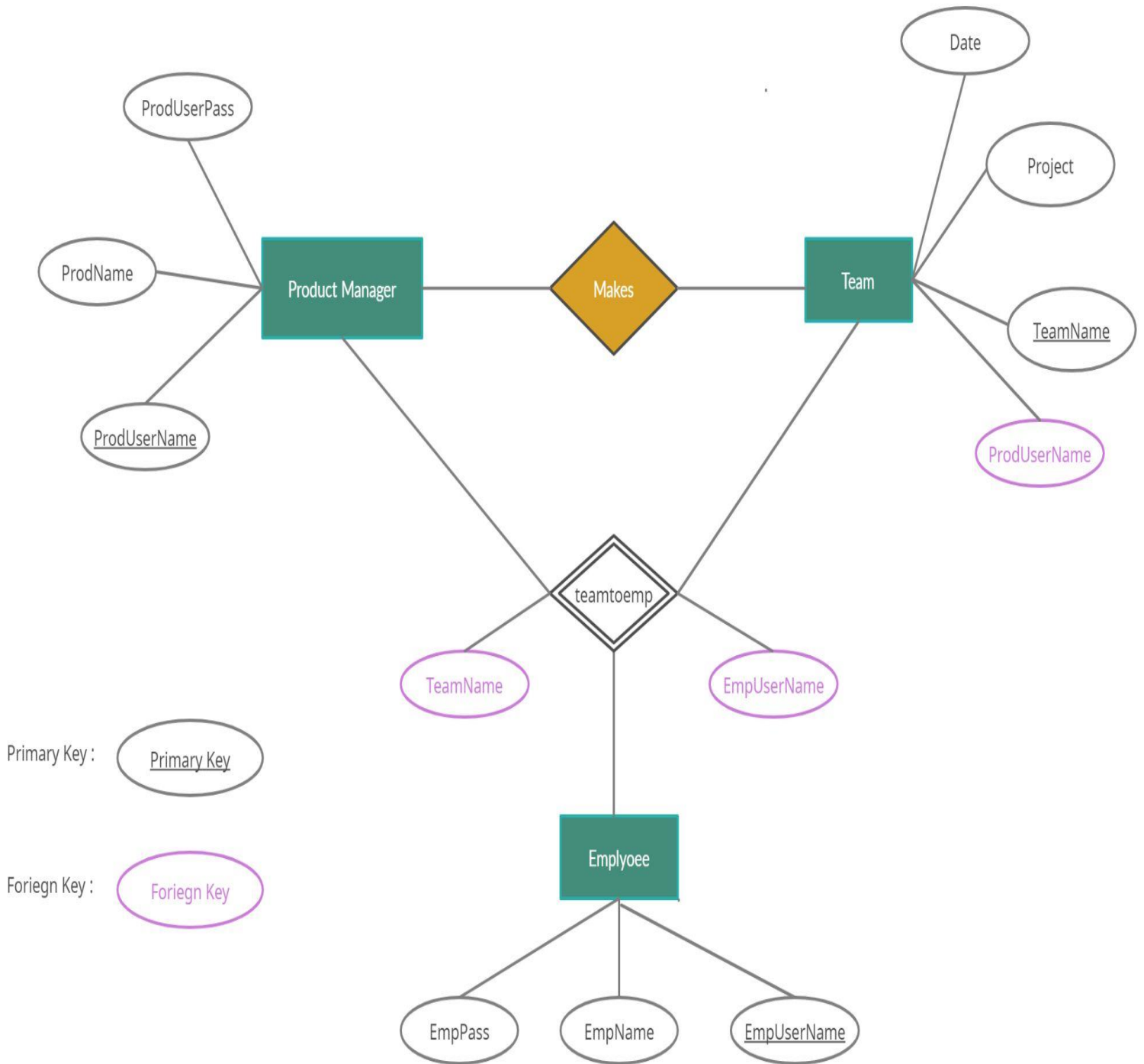
Project Report

EasyManage

Introduction

EasyManage © is a **Requirement Management** web application which is designed to manage multiple teams working under a project manager where a Project Manager can create or delete a team ,add or remove members from a team and assign projects to these teams. It also keeps a record of all employees ,project managers, teams ,employees in a team ,project assigned to a team and date when project is assigned. This product will assist the organization in maintaining the record of every project it undertakes . All the information relevant to the team and project ,and team members can be maintained by this tool.

Entity Relationship Diagram



3NF-Normalization of Tables

Conditions to be satisfied in 3NF form:

1. All attributes must be atomic- Satisfied by logical checks while updating tables.
2. All non key attributes are fully functional dependent on the primary key.
3. Not contain any transitive partial dependency.

1. employee

				EmpUserName	EmpName	EmpPass
<input type="checkbox"/>		Edit		Copy		Delete
		AyushBhagta		Ayush		123456
<input type="checkbox"/>		Edit		Copy		Delete
		AyushKhandelwal		Ayush		babblu
<input type="checkbox"/>		Edit		Copy		Delete
		MonishAnsari		Monish		123456
<input type="checkbox"/>		Edit		Copy		Delete
		navneet		Navneet Bhole		navneet
<input type="checkbox"/>		Edit		Copy		Delete
		Rahul12		Rahul		123456
<input type="checkbox"/>		Edit		Copy		Delete
		SanketKokude		Sanket		123456
<input type="checkbox"/>		Edit		Copy		Delete
		VifulNirala		Viful		123456

Primary Key: EmpUserName

Functional dependency: EmpUserName=>{EmpUserName,EmpName,EmpPass}

Table satisfies all three conditions as table only has atomic values and primary key can only determine all other non key attributes. Also there is no transitive as there is only one FD mentioned above.

2. prodManager

+ Options				ProdUserName	ProdName	ProdPass
<input type="checkbox"/>		Edit		Copy		Delete
		AkhileshYadav		Akhilesh Yadav		1234
<input type="checkbox"/>		Edit		Copy		Delete
		Ayushbhagta		Ayush		123456
<input type="checkbox"/>		Edit		Copy		Delete
		navneet		Navneet Bhole		navneet
<input type="checkbox"/>		Edit		Copy		Delete
		Rahul12		Rahul		12345
<input type="checkbox"/>		Edit		Copy		Delete
		Rahul123		Rahul		123456
<input type="checkbox"/>		Edit		Copy		Delete
		VikasKumarYadav		V.K. Yadav		1234

Primary Key: ProdUserName

Functional dependency: ProdUserName=>{ProdUserName,ProdName,ProdPass}

Table satisfies all three conditions as table only has atomic values and primary key can only determine all other non key attributes. Also there is no transitive dependency as there is only one FD mentioned above.

3. team

	TeamName	ProdUserName	Project	Date
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	T-03	AkhileshYadav	https://firebasestorage.googleapis.com/v0/b/easyma...	01-05-2021
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	Team1	VikasKumarYadav	https://firebasestorage.googleapis.com/v0/b/easyma...	01-05-2021
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	TestTeam1	AkhileshYadav		
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	TestTeam2	VikasKumarYadav		

Primary Key: TeamName

Functional dependency: TeamName=>{EmpUserName,TeamName}

Table satisfies all three conditions as table only has atomic values and primary key can only determine all other non key attributes. Also there is no transitive dependency as there is only one FD mentioned above.

4. teamtoemp

+ Options	
TeamName	EmpUserName
Team1	AyushKhandelwal
TestTeam2	AyushKhandelwal
Team1	AyushBhagta
Team1	MonishAnsari
TestTeam2	VifulNirala
TestTeam2	AyushBhagta
TestTeam1	VifulNirala
TestTeam1	MonishAnsari

Primary Key: {TeamName,EmpUserName}

Functional dependency: {TeamName,EmpUserName}

=>{TeamName,EmpUserName}

Table satisfies all three conditions as the table only has atomic values and both the attributes are primary so it can't violate the second condition. Also there is no transitive as there is only one FD mentioned above.

Hence we can see all the tables used in the database are normalised to 3NF form.

Tools and Technology Used

Our web application consists of 3 basic parts that could be distinguished as :

1. **Frontend Application**-Front-end web development is the practice of converting data to a graphical interface, through the use of HTML, CSS, and JavaScript, so that users can view and interact with that data. Here we have used React framework to make the frontend more effective and make it more expandable as the components could be reused and modified as per the requirements. It is from where the application makes calls for the data or changes in data through API calls that are further handled by the backend application. To host this application we used **google firebase** hosting due to its API call speed ability and cost efficiency.
2. **Backend Application** -Back end development refers to the server side of an application and everything that communicates between the database and the browser frontend application. Many different technologies could be used for the purpose but we used node.js for the purpose of making the whole project unified to a particular programming language and further better speed of accessing and forwarding data in correct format is another reason for choosing it. Node.js is an cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser .In **node.js** we used a framework known as **express** to listen to the port for API and handle the API calls to make proper calls to Database.Further library called "mysql" to make queries to our database.To host this application we used **heroku** hosting due to its API call speed ability and cost efficiency.

3. **Database Connected** - Database used in our application is mysql. We have hosted our database on a remote server using <https://www.freesqldatabase.com>. MySQL Database Service is a fully managed database service to deploy cloud-native applications. Along with that we have used phpMyAdmin, which is a free software tool to handle the administration of mysql over the web.

Implementation details

1. To create the registration system for both project manager and employee we have a registration API that will be handled at our backend according to the parameters passed that will be called from the front end whenever a new employee or manager will try to register.

Here when the call is made, the backend app will first look if the username is available or not and if available will send a proper response that will be handled at the frontend. Further if the username does not exist in the database, a new employee/manager with the passed details will be generated.

2. To create the login system for both project manager and employee we have made an authentication API that will be handled at our backend according to the parameters passed that will be called from the front end whenever an employee/manager will try to login.

Here when the call is made, the backend app will first look if the account with this username exists or not and if it exists, and if the username doesn't exist an appropriate result is sent to the frontend. Further if the username exists then it will check if the password entered matches to that account or not and then according to the situation the information will be passed to the frontend which will be handled accordingly.

3. In Product Manager Dashboard we have provided a button to create a new team which in turn will call an API to insert a new team in our database. We have also ensured that there can't be multiple teams with the same name so each team can be identified uniquely.

4. On creating a team multiple options are provided to product managers according to the state of the team like *add members,remove members ,assign a project and delete the whole team.*
- To add a member to a team you will click on add members which will call an API to list all employees which are not member of that particular team. Whenever you select an employee to be added in a team, an API call is called which employee username and team name as argument which insert this employee to this particular team in our database.
 - A Similar action is performed to remove an employee from a team, when we click on the delete button for an employee, an API call is called which employee username and team name as argument which delete this employee from this particular team in our database.
 - To permanently delete a team it removes from the team table in our database and also information related to the team of regarding employee in that team and projects assigned to that team are also removed from the database
 - To store the assigned project file we have used google firebase as storing the project file in mysql database usually slows the application. In order to overcome that we have stored the file(pdf,doc,docx) in google firebase and its download url is saved in our database which will be retrieved whenever the project manager wishes to see the project file assigned to a team.
 - Other options like removing a project where we just remove the download url of that project from the database and delete it from the storage. Further there is an option for replacing the project file where we first remove the current project and then add a new project file in our firebase and database are also added.
5. In the *employee dashboard* ,it can see all the teams that he is a part of and can also get information about the team like project manager ,project file and date when the project was assigned.
6. Now to deploy the project for easy and remote accessibility we have hosted both frontend,backend and mysql database.
- Web host: <https://easymanageapp.web.app/>
 - Backend host: <https://afternoon-oasis-52750.herokuapp.com/>

- Database host: sql6.freemsql.com