Database Systems CSC 675-03
Spring 2019
Milestone 1:
The Semantic Model
04/12/2019

CentiPayroll

Team 5:
Edwin Menjivar - Team Lead
Kenneth Surban - Github Master
Jeffrey Piercy
Rowvin Dizon
Andrew Keelin

Milestone Version	Date
M1V1	04/02/2019
M1V2	04/12/2019

Table of Contents

Executive Summary

Our team will be creating CentiPayroll, which is a payroll management web application. The team's motivation towards developing this application is that we would like to help small businesses by bringing them a web application that is not as expensive as other more complex and more expensive softwares that are in the market. The importance of developing this application is that our team is very familiar with the topic of payroll management, therefore we will be able to create a well developed database system.

CentiPayroll will focus on bringing a web service for small businesses who do not have a digital way of keeping track of their employees worked hours due to economic limitations. The purpose of CentiPayroll is to allow employees to be able to clock in and clock out during their time cards, and employers should be able to look at the hours' report. The way the website will work is by having the employer being able to login as an administrator or as a web time clock app. If the employer logs in as an administrator, they should be able to access all the information regarding their business. The information that they can access will range daily/weekly/monthly reports to being able to add/delete/edit employees. The employer will also be able to view information related to the amount of money each employee will earn for any given period of time. If the employer clicks on time clock app, the website will display a numeric keypad. Each employee will have a pin number assigned to them, and they will type that pin in the numeric keypad in order to clock in or clock out.

What will be unique and special about CentiPayroll's database is that we will have multiple tables, which will be referenced from different tables. We will do this so that whenever a user tries to access some data, he will not be able to access everything in the database, unless they have specific information, therefore making our application more secure.

Entities

Website	The website is the interface by which registered users use and administer their payroll system.
Unregistered User	A user that visits the website but has not registered an account.
Registered User	A user that visits the website and has registered an account.
Company	A company is a logged in user. This is the administrator of their individual payroll system. A company can add/remove employees, add/edit/remove their time cards, and fetch reports. When a new employee is hired, a company adds their information to the website, and an employee becomes a new entity. The company has full access to everything that has to do with that employee, and can add/edit/remove their time cards. At the end of the week, one company can fetch a report for each employee given any time range.
Employee	Employee is specialized in clocking in and clocking out before and after their daily time cards. When an employee arrives into their job, or when they take a break, the website will display a number pad, in which they will insert their unique pin to clock in. At the end of their time cards, or at the end of their breaks, the employee should use the same number pad displayed in the website to enter their unique pin again, meaning that they would be clocking out.
Time Card	A time card is as set of two time punches by an employee. When the employee punches his pin once in the number pad, this is called clocking in, the second time the employee punches his pin, it is called clocking out. Each set of two of this punches is called a time card. A time card will be used to keep track of the total hours worked by each employee for any given time range, by using a report.
Report	A report is a set of time cards in the database. This one will be accessed by the company, whom will set a range to retrieve as many time cards as there are in that range for any number of employees. If the company wants to see the hours worked by an employee in the past week, they will set the time range to cover the entire week, and the screen should

	show all the time cards for that employee for that given time range, as well as the total hours worked for the entire time week.
Paycheck	A paycheck is an entity that includes the name of an employee, and the total amount of money that they have earned for any given report. This will help the Company keep track of the amount of money each employee earns, without the need to do any calculations.

Business rules

1. CentiPayroll can be visited by multiple users
2. Unregistered users can register only one account
3. Registered users can log into CentiPayroll
4. Multiple employees can be controlled by a Company
5. Multiple time cards can be controlled by a Company
6. Multiple reports can be controlled by a Company
7. One employee can submit multiple time cards
8. One report can include multiple time cards
9. Multiple paychecks can be created from only one report
10. Multiple paychecks can be paid to only one employee

Functional requirements

Entity: Company (strong)
Relations: Controls
Attributes:

- id (key)
- name
- email
- password

Entity: Employee (strong)
Relations: Submits
Attributes:

- id (key)
- name (composite)
- pin
- wage

Entity: Time Card (weak)
Relations: Includes, Submits
Attributes:

- id (key)
- time_in
- time_out

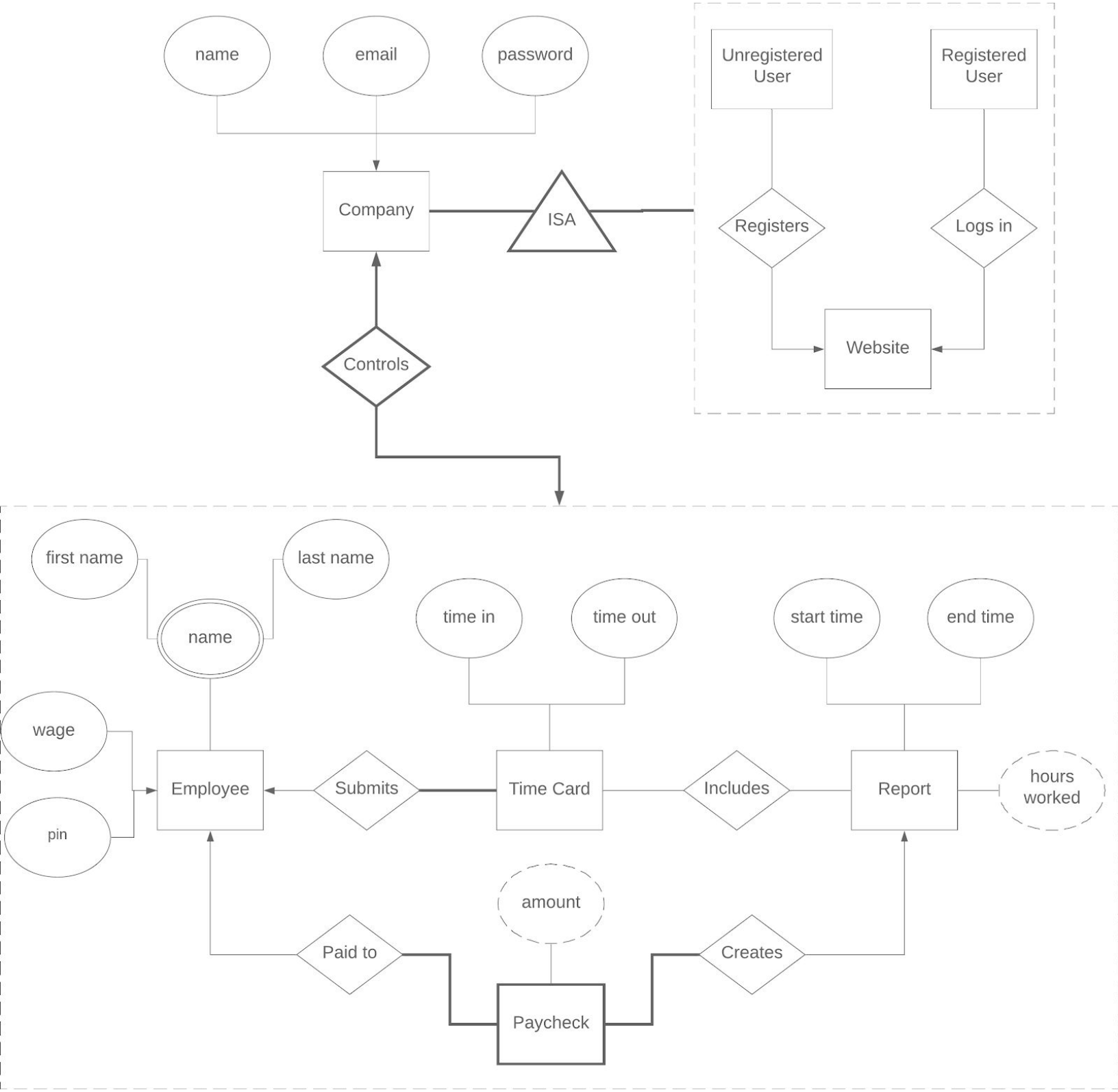
Entity: Report (strong)
Relations: Includes, Creates
Attributes:

- id (key)
- start_time
- end_time
- hours_worked (derived)

Entity: Paycheck (weak)
Relations: Paid_to
Attributes:

- id (key)
- amount (derived)

Entity Relationship Diagram(ERD)



ERDs Test

Business Rule #	Entity	Relationship	Type of Relationship	Entity	Pass/Fail	Modify
1	Website	visited	1-M	User	Pass	
2	Unregistered User	register	M - 1			Not seeing Account entity?
3	Registered User	Logs in	M - 1	Website	Pass	
4	Employee	Controls	**M - N**	Company	Pass	
5	Time Card	Controls	**M - N**	Company	Pass	
6	Report	Control	**M - M**	Company	Pass	
7	Employee	Submits	1 - **M**	Time Card	Pass	
8	Report	include	M - N	Time Card	Fail	Business Rule states “One report can include multiple time cards” which i believe would be a 1 - M
9	Paycheck	Creates	**M** - 1	Report	Pass	
10	Paycheck	Paid to	**M** - 1	Employee	Pass	

NON-functional requirements

Security

1. Login shall be required to make changes to the data.
2. Passwords shall be encrypted.
3. The security of database(s) shall be set that only authorized DB administrators are permitted from creating, editing, and removing data from database(s).

Audit

1. Only company administrators shall have website accounts.

Performance

1. Database shall also be optimized to add retrieve queries made quickly and efficiently.
2. Application shall be able to retrieve information from the database and display/act in a timely manner.
3. Website pages shall take no longer than two seconds to load

Capacity

1. The website shall handle at least 25 employees per company.
2. The website shall use no more than 75% of the total storage available.
3. The website shall be able to handle at least 100 time cards per employee.

Data Integrity

1. The integrity of of data shall be checked weekly/bi-weekly by administrators, back-end engineers, or Team Lead.
2. Data shall be backup during every check up.

Recovery

1. Recovering user data shall be the main priority in case of a complete fail.
2. The website shall not be down for more than 3 hours.

Website Policies

1. The website shall contain a link directed to the policies of the site.
2. Users shall agree to the site policies before creating an account.

Conformance with coding standards and Scalability

1. Application shall be developed, tested, and deployed using tools and servers approved by Class Professor and as agreed in M0.

2. Database(s) shall be optimized to fit ERD models and Business Rules as stated previously in this document.
3. Selected Database schema shall cover required columns and rows as dictated by ERD and application specifications.
4. Database shall scale relatively easy with all entries matching the column names listed in each database schema.
5. Data shall be stored in the team's chosen database (MySQL) on the team's deployment server.
6. The language used shall be in English.
7. Before data is pushed onto the database(s), it will be checked by administrators, back-end engineers, or Team Lead.
8. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development.
9. Requests shall be handled in a asynchronous manner.

Enumerate the work done by each team member (0-10)

Edwin Menjivar (Team Lead)- 10
Kenneth Surban (Github Master)- 10
Jeffrey Piercy - 10
Rowvin Dizon - 3
Andrew Keelin - 10