COSC 457 - 002

Employee Database for Dragos Cybersecurity

Database Management Systems Project

Prepared By: Dilinna Madueke, William Naylor, Addison Ralston, and Sophia Schatz

Instructor: Sung-Chul Hong

Institution: Towson University

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Signature of Interviewee

Dragos Database Project Introduction

This database project for Dragos Inc. began in February of 2025. The purpose of this project is to design and implement a database application for Dragos. This database will keep track of employees, employee types, pay group, supervisor, department, product, office, and assets. So far we have gathered information about the company and designed a database for it, visually representing this using an entity relationship diagram and schema. This database will allow Dragos to efficiently and thoroughly track their records.

We are a group of 4 undergraduate students at Towson University working on this project. We have created our entity relational diagram and schema using “miro”. This project is currently being done for the Database Management Systems class, this incorporates the database and software knowledge we have been learning over the course of the semester.

Dragos Profile

Dragos Inc., founded in 2016, is a cybersecurity company specializing in protecting industrial control systems (ICS) and operational technology (OT) environments. Headquartered in Hanover, Maryland, with offices in Houston, Australia, and Dubai, Dragos has a team of 480 experts dedicated to securing critical infrastructure from cyber threats.

Established by ICS/OT security specialists with experience defending the U.S. government, allied nations, and global enterprises, Dragos offers a range of cybersecurity solutions. Among these are The Dragos Platform, an advanced security software that helps organizations detect, respond to, and prevent cyber threats, as well as Neighborhood Keeper, a global threat intelligence and analytics sharing program that enables organizations to collaborate and share cybersecurity insights without exposing sensitive data. In addition to these, Dragos provides other technologies and services designed to enhance ICS/OT security and resilience.

Beyond its technology solutions, Dragos provides Professional Services, offering proactive security assessments and rapid incident response to help organizations prepare for and recover from cyber threats. Its Threat Intelligence service delivers in-depth research and actionable recommendations to counter evolving cyber risks in industrial sectors.

With a mission to safeguard civilization, Dragos remains a trusted leader in industrial cybersecurity, helping organizations worldwide protect their critical infrastructure from growing cyber threats.

Dragos Employee Database Process Description

The Employee Database System at Dragos is designed to maintain detailed records of all employees and their related attributes within the organization. This system ensures efficient tracking of employment details, job assignments, and administrative processes.

New employees undergo a structured onboarding process that begins with their registration in the Employee Database. During registration, essential personal and job-related details are recorded, including Name, Employee Number, Address, Email, Phone Numbers, Location, and Job Information. The system also records employment status, such as full-time, part-time, or contractor, as well as their assigned Pay Group, which dictates pay structure, pay frequency, and overtime rates.

Each employee is assigned to a Department, which has a unique Department ID, Name, Budget, and Employee Count. Within each department, a designated Department Head oversees operations, manages budgets, and supervises employees.

Employees are assigned to work on specific Products within the organization. Each product is linked to a Department and contains attributes such as Product ID, Name, Description, Status, and Version. This allows for clear tracking of which employees contribute to each product's development and maintenance.

Employees are assigned to a designated office, identified by its Office ID, Name, and Location. Additionally, employees may be assigned organizational assets such as laptops, phones, or specialized equipment. These assets are tracked by attributes including Asset ID, Type, Brand/Model, Serial Number, Purchase Date, Condition, and Warranty/Expiration Date.

The Employee Database System manages hierarchical relationships within the organization. Supervisors oversee employees, and reporting structures are maintained within the system to ensure clarity in responsibilities. The system supports multi-level management, enabling seamless reporting for evaluations, payroll, and administrative oversight.

Employees receive payments based on their Pay Group, which defines their Pay Rate, Payment Period, and Overtime Rate. Employees who qualify for benefits, such as full-time employees, are automatically enrolled in the appropriate programs. Contractors and part-time employees follow their respective pay structures and contract terms.

Supervisors and HR personnel update employee records as needed, including changes in job roles, department transfers, or promotions. The system also tracks employment milestones such as Last Hired Date and Seniority Level to ensure smooth workforce planning.

This structured Employee Database ensures that all personnel-related data is up-to-date, facilitating seamless workforce management, payroll processing, and organizational planning at Dragos.

User Requirements

a. Process Modeling Requirements

The Employee Database maintains comprehensive records of all employees and their associated details within the organization. Each Employee has personal and job-related attributes, including Name (First Name, Middle Name, Last Name), Employee Number (unique for each employee), Address, Email Address (multi-valued), Phone Numbers (multi-valued), Location, Seniority, Last Hired Date, Cost Center, Job Code, Job Description, Status, Marital Status, Date of Birth, Nationality, Sex, Ethnic ID, and Disability Status.

Employees are categorized based on their employment type, which is represented by the *Employee Type* entity. This entity includes attributes such as Employee Type ID, Name, Work Hours, Overtime Eligibility, Benefit Eligibility, and Contract Duration (where applicable). Possible employment types include Part-time, Full-time, and Contractor.

Each Employee Type is associated with a corresponding *Pay Group*. The *Pay Group* defines the pay structure for employees and includes attributes like Pay Group ID, Pay Rate, Pay Frequency, Payment Period, and Overtime Rate. Every Employee Type has one corresponding Pay Group, determining the payment terms for the employees in that category.

Employees can *supervise* other employees within the organization. An employee designated as a *supervisor* is responsible for overseeing the work and

performance of their assigned subordinates. Each supervisor may have one or more employees reporting to them

Employees belong to a *Department*, which is identified by Department ID, Name, Budget, and Employee Count. An employee who serves as a supervisor is designated as the *Department Head*. Each Department has one Department Head, who is eligible for bonuses, a privilege not extended to other employees. A Department Head can also be responsible for managing the department's overall budget and workforce.

Each Employee works on one or more designated *Products*, where each Product has attributes like Product ID, Name, Description, Status, and Version. Every Product belongs to a specific Department, allowing for the identification of the department associated with any given Product.

Employees are assigned to an *Office*, with attributes such as Office ID, Name, and Location. Each employee works in a specific office location within the organization.

Additionally, employees may be assigned *Assets*, which include attributes like Asset ID, Type, Brand/Model, Serial Number, Purchase Date, Condition, and Warranty/Expiration Date. These assets are tracked and managed to ensure proper maintenance and efficient use within the organization.

b. Data Modeling Requirements

Allow an authorized user to manually input information for *Employee, Employee Type, Pay Group, Supervision, Department, Product, Office, and Assets.*

1. Employee
    a. Allow input of *Employee* details.
    b. Enable updating and deletion of *Employee* records as needed.
2. Employee Type
    a. Maintain records for various *Employee Types*, specifically for types like Part-time, Full-time, and Contractor.
    b. Ensure that each *Employee Type* is linked to a *Pay Group*.
3. Pay Group
    a. Store details of *Pay Groups,* specifically for types like Semi-mothly and Hourly.
    b. Assign each *Employee Type* to a corresponding *Pay Group*.
4. Supervisor
    a. Track *Supervisor-Employee* relationships where an *Employee* can supervise multiple *Employees*.
5. Department
    a. Maintain *Department* records.
    b. Identify *Department Heads* and ensure assignment of unique bonus eligibility privileges.
6. Product
    a. Record details for each *Product*.
    b. Associate each *Product* with a specific *Department*.
    c. Track employees working on each *Product*.
7. Office
    a. Store information about each *Office* location.

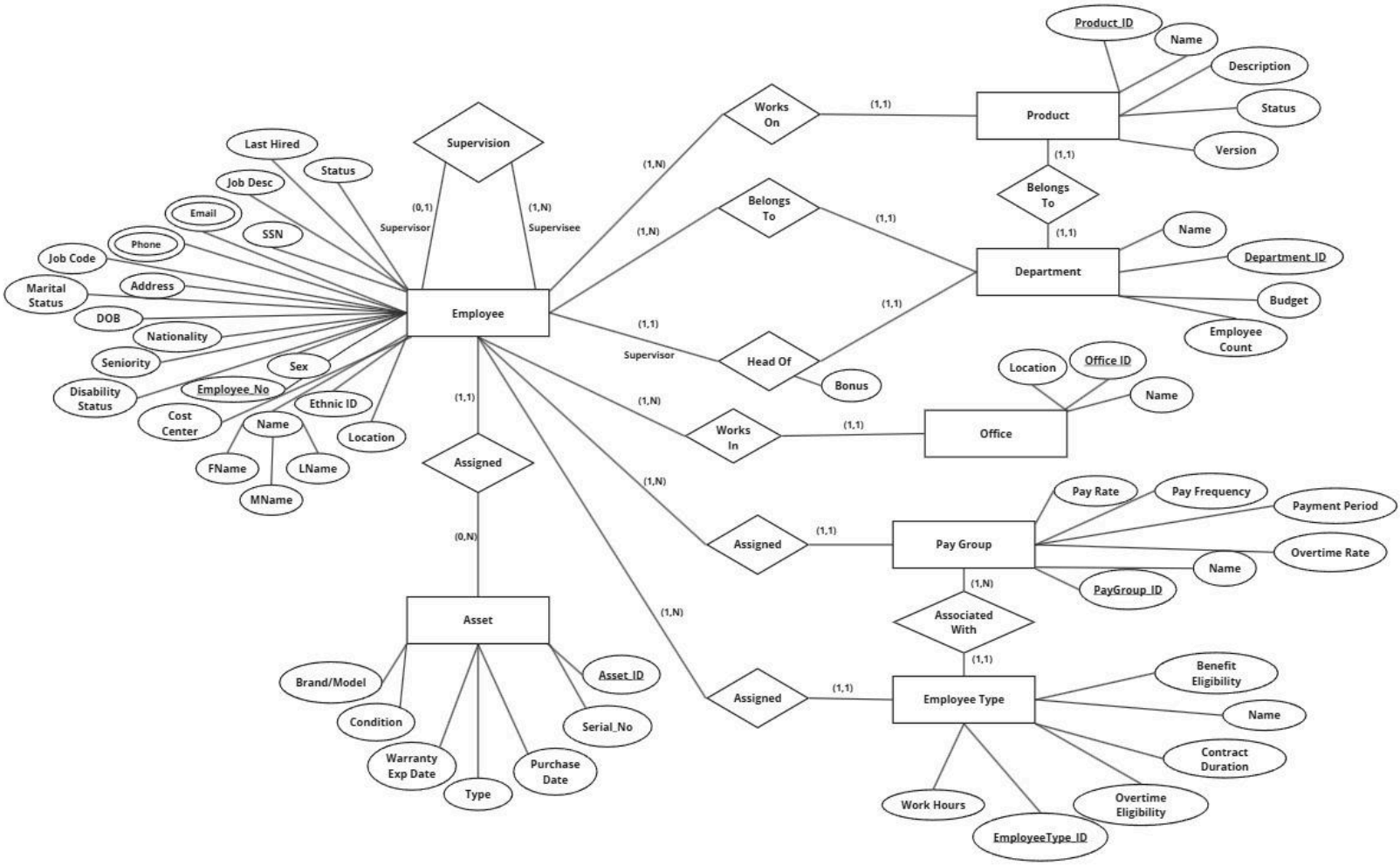
    b. Assign *Employees* to specific *Offices* within the organization.

8. Asset
    a. Maintain *Asset* records.
    b. Associate *Assets* with *Employees* to track usage and maintenance.

c. Expected Database Queries

1. Find the list of employees supervised by a given employee.
2. Get the details of employees who have worked in the company for more than 5 years.
3. Find employees who are eligible for overtime.
4. Retrieve a list of all employees working on a specific product.
5. Find employees assigned to a particular office location.
6. Retrieve the department head for a specific department.
7. List all employees categorized as full-time, part-time, or contractors.
8. Find the total number of employees in each department.
9. Get the details of employees with more than one phone number or email address.
10. Retrieve employees whose employment type corresponds to a specific Pay Group.
11. Find all employees who own a company asset, along with asset details.
12. List all employees who belong to the same Pay Group and their payment frequency.
13. Retrieve a list of all products managed by a specific department.
14. Find the warranty expiration dates of all assets assigned to employees.
15. Retrieve all details of employees working in a specific department.

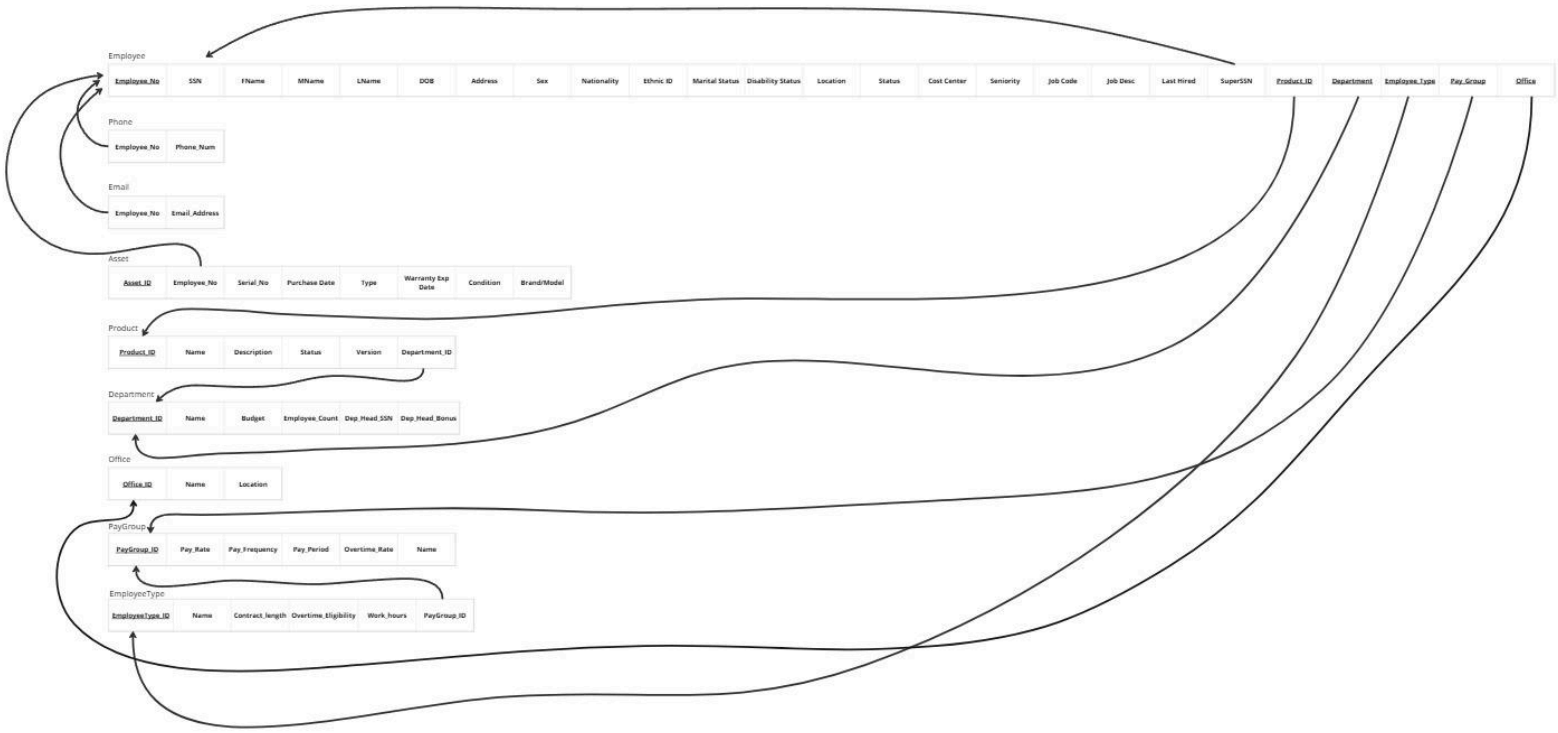
Entity Relationship Diagram



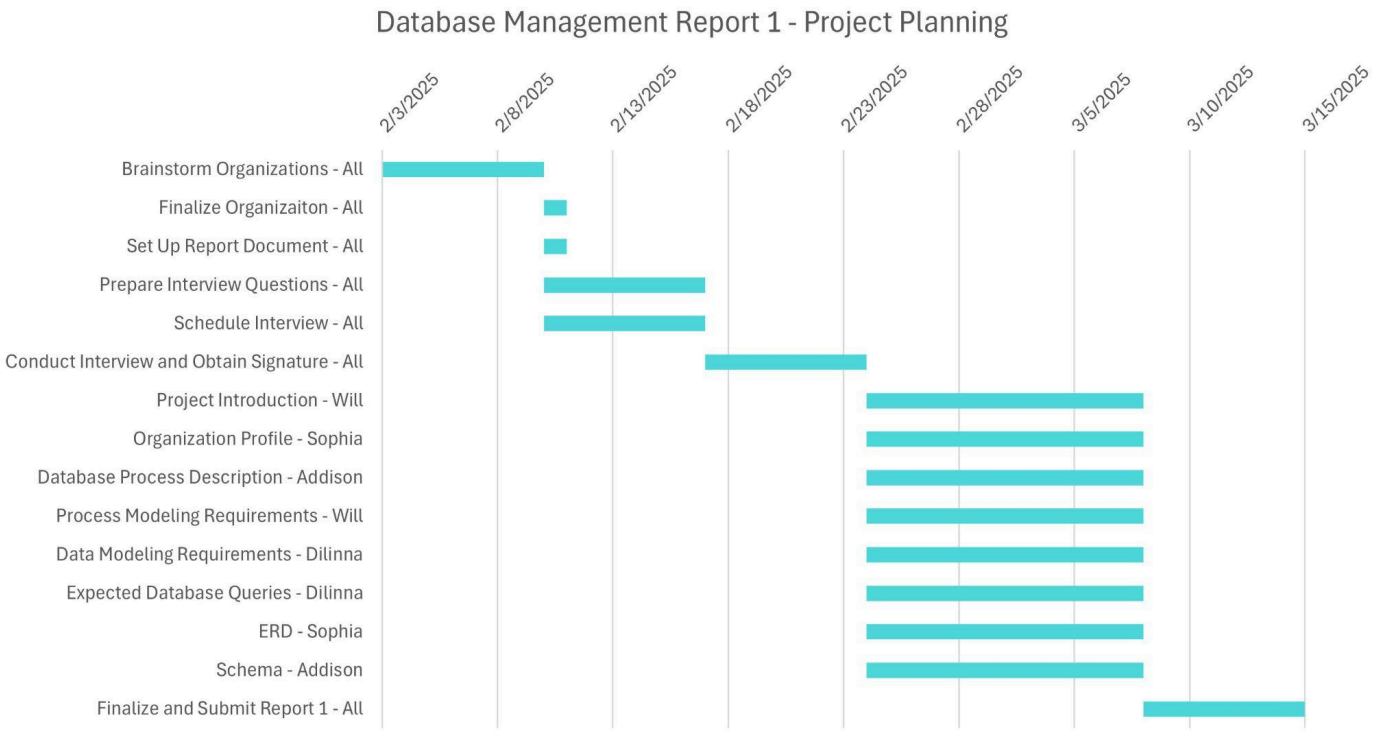
a. Example Assumptions

- Each Employee has a unique Employee Number as the primary key.
- Each Employee belongs to one Employee Type (Full-time, Part-time, or Contractor).
- Each Employee Type is linked to one Pay Group, which defines pay rate and frequency.
- Each Department has one Department Head, who is eligible for bonuses.
- Each Employee is assigned to one specific Office and one specific Department.

Schema



Tasks and Planning



Meeting Log

Date and Time	Place	Member Contribution
2/3/2025 3:30pm	York, After Class	All members worked to brainstorm organization ideas
2/10/2025 3:30pm	York, After Class	All members reach out to two organizations and await responses
2/15/2025 7:45pm	Online	All members finalize organization, set up report document, and prepare interview questions
2/17/2025 12:00pm	Online	All members divide tasks, and create gantt chart for reference
2/24/2025 5:00pm	Other	Sophia conducted interview and obtained interviewee signature
3/5/2025 8:00pm	Online	Sophia creates ERD and Dragos profile, Dilinna writes data modeling requirements and expected database queries, Addison creates schema and writes database process description, Will writes project introduction and process modeling requirements
3/12/2025 8:30pm	Online	All members finalize report and Sophia submits report 1

References

"Industrial Cybersecurity Technology for OT Asset Visibility: Dragos." *Dragos*, www.dragos.com/. Accessed 10 Mar. 2025.