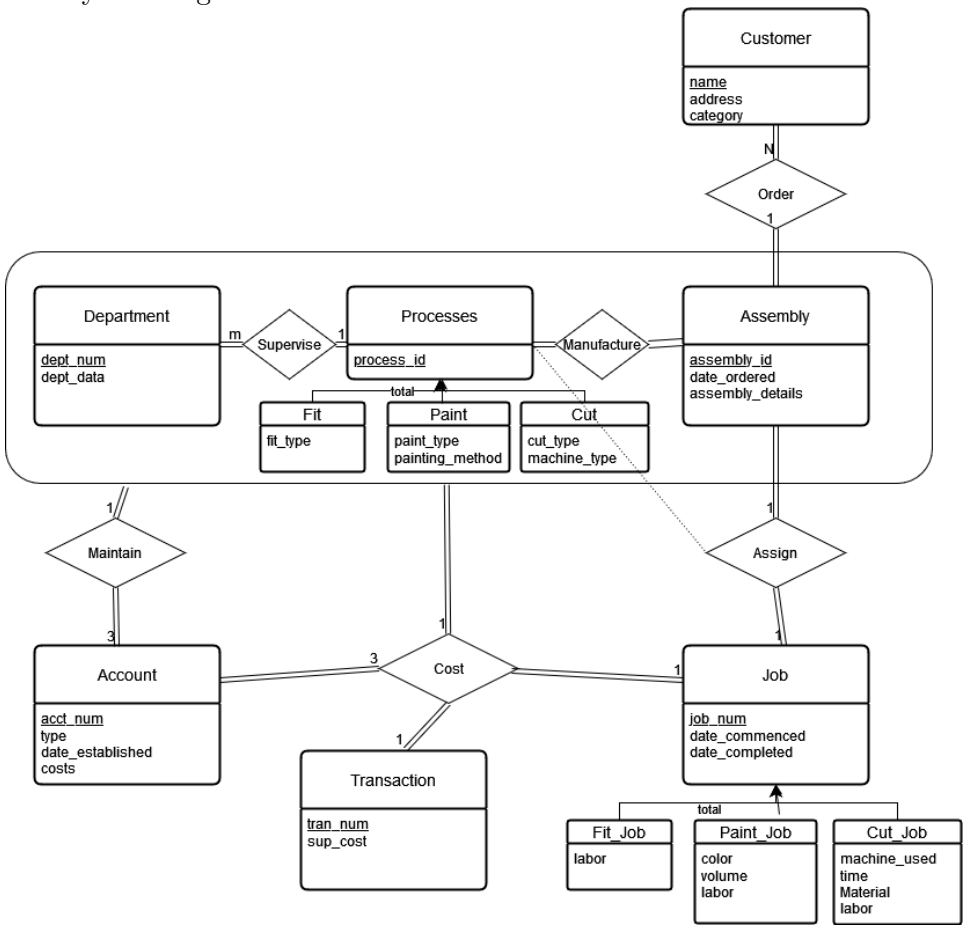
NAME: Nicholas Jacob
EMAIL: nicholas.c.jacob-1@ou.edu
STUDENT ID: # 113578513
Final Project
COURSE: CS/DSA 4513 DATABASE MANAGEMENT
SECTION: ONLINE
SEMESTER: FALL 2023
INSTRUCTOR: DR. LE GRUENWALD
SCORE:

Contents

1 ER Diagram

Here is my ER diagram



2 Relational Database Schema

Here are my schema:

Process(process_id,process_data)
Assemblies(assembly_id,date_ordered, assembly_details)
Manufacture(process_id,assembly_id)
Customer(name,address, category)
Order(name,assembly_id)
Department(dept_num,dept_data)
Supervise(dept_num,process_id)
Fit(process_id, fit_type)
Paint(process_id, paint_type, painting_method)
Cut(process_id,cutting_type, machine_type)
Maintain(acct_id, dept_num, process_id, assembly_id)
Account(acct_id, type, date_established, costs)
Job(job_num, job_date_commenced, job_completed)
Assign(job_num, assembly_id,process_id)
Costs(job_num, acct_id,process_id, assembly_id, tran_num,dept_num)
Fit_Job(job_num, labor)
Paint_Job(job_num,color,volume, labor)
Cut_Job(job_num, machine_type, time, material, labor)

3 Storage

Table Name	Query Number and Type	Search Key	Query Frequency	Selected File Organization	Justification
Customer	1 Insertion	name	30/Day	heap tree on name	At the moment adding lots of data and not accessing it directly often
Department	2 Insertion	dept_num	infrequent	Sequential on dept_num	Since this data is added infrequently but referenced by other tables often, sequential insertion seems appropriate.
Process (and sub categories)	3 Insertion	process_id, (sub category info)	infrequent	Sequential on process_id (and sub category id)	Infrequent insertion but often called
Supervises	3 Insertion	process_id and dept_num	infrequent	Sequential on process_id	Infrequent insertion but called often on process_id
Orders	4 Insertion	name, assembly_id	40/Day	dynamic hash on name and ass_id	This is a lot of orders to create each day. These will need to be joined with other tables frequently as is happening in our insertion so it is important to be easily accessible
Create	4 Insertion	process_id and ass_id	40/Day	dynamic hash on process_id and ass_id	Frequent insertion with joins on other tables
Account	5 Insertion	type and acct_id	10/Day	Multitable clustering with type for clustering and acct_id sequential	This structure will make for fast access later and there is a fair amount of additions here.

Table Name	Query Number and Type	Search Key	Query Frequency	Selected File Organization	Justification
Job	6 Insertion	job_num			
Job	7 Random Search (Insertion of job_date_end)	job_num	50/Day	B tree on job_num	To enter completion data, you'll need a random search on job_num. B tree will be an efficient storage for all these records
Customer	12 Range Search	name (in order) by category	100/Day	Multitable Clustering with category for clustering and name stored in a B^+ tree	Since this data is accessed often this table should be pre-built. New customers are added often so B^+ tree storage on name will be most efficient within this multitable