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Final Project
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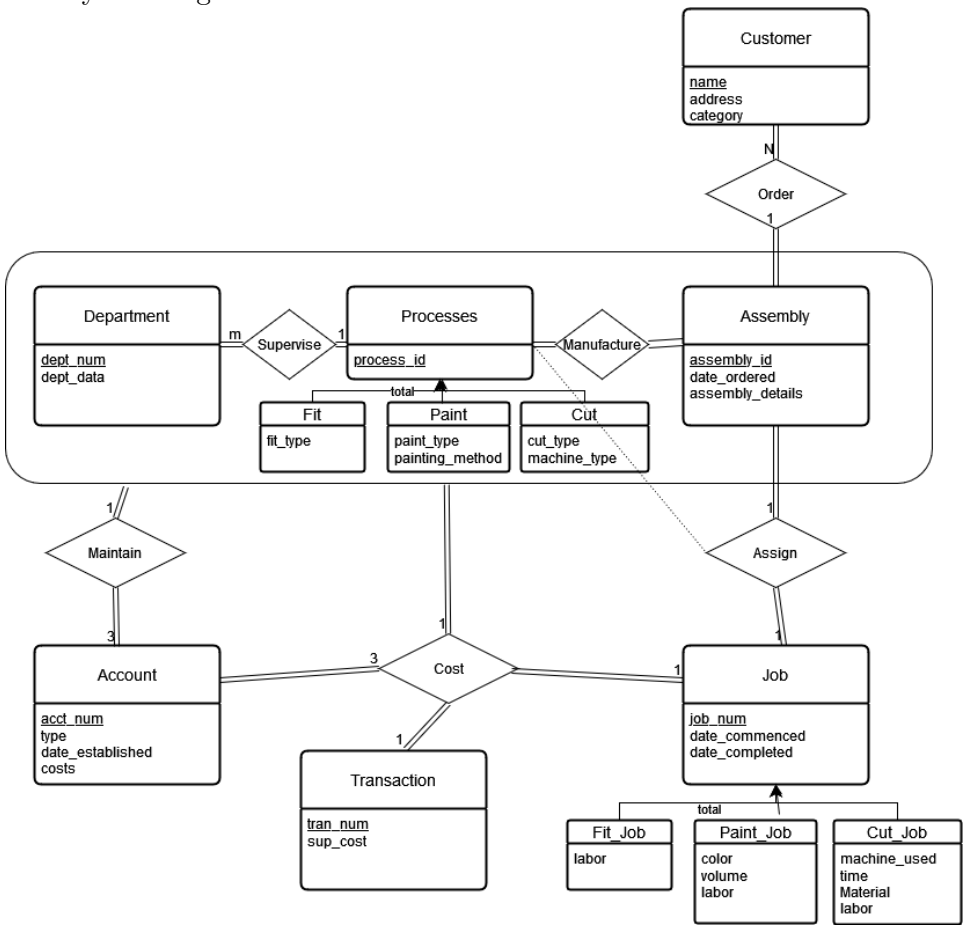
SCORE:

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)
Account(acct_id, type, type_id, date_established, costs)
Job(job_num, job_date_commenced, job_completed)
Assign(job_num, assembly_id,process_id)
Transaction(tran_num, sup_cost)
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 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
Manufacture	4 Insertion	assembly_id	40/Day (but each assembly may have many processes)	dynamic hash on assembly_id	Frequent insertion with joins on other tables
Account	5 Insertion	type_acct and num	10/Day	Multitable clustering with type_acct for clustering and num 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	50/day	B tree on job_num	B tree is appropriate for often inserted and often called index.
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
Transaction and Accounts	8 Random Search	tran_no and ids for account	50/day	sequential on the ids for the accounts and tran_no	We'll need to update a lot of accounts here so it will be important to get to them quickly
Account	9 Random Search	type = Assembly and num	200/day	B tree on num	We have previously done clustering on these attributes so this will require nothing additional to the file
Job	10 Range Search	job_date_commenced and job_date_completed	20/day	Sequential index on both dates	Frequent call. If put in order can retrieve data faster
Manufacture	11 Random Search	assembly_id	100/day	Sequential index on assembly_id	This index was already created for Query 4.
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
Cut_Job	13 Range Search	job_num	1/Month	Sequential Index on job_num	Since we are doing a range search, we would like these to be in order.
Paint_Job	14 Random Search	job_num	1/Week	Dynamic Hash function on job_num	since we are accessing occasionally but adding lots of jobs, it would be nice to have quick access via a hash.

Info on Azure indexing can be found here.