

- **Types of fact tables**
 - **Transaction fact table**
 - **Snapshot fact table**
 - **Accumulating Snapshot fact table**

Transaction fact tables

Capture details of events and activities

- Sales transactions

- Course registrations

- Student attendance

- Telephone calls

Snapshot fact tables

Measure the effect of a series of events or activities

- Bank balances

- Inventory levels

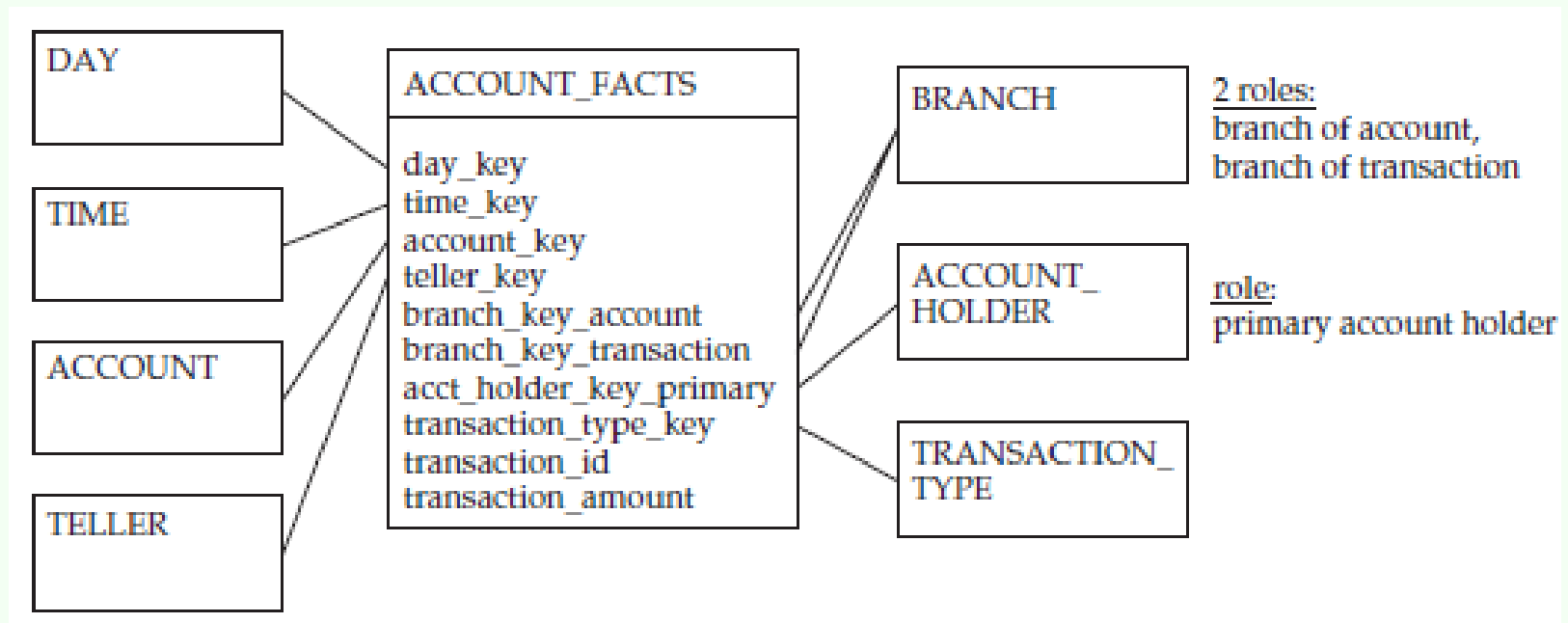
- End of term registration/grades

Measurement is taken at some defined interval

Snapshot fact tables

Bank account example, p 262-267

A schema with a transaction fact table:



Snapshot fact table

Example of transactions in transaction fact table for account 7922-3002

From 2/1/2009 to 2/14/2009

Granular transaction data stored in star:

Day	Transaction Type	Transaction Amount
2/1/2009	Initial Deposit	2000.00
2/2/2009	Withdrawal	(20.00)
2/3/2009	Check	(35.50)
2/3/2009	Check	(17.02)
2/6/2009	Check	(75.00)
2/6/2009	Deposit	75.00
2/7/2009	Check	(800.00)
2/10/2009	Check	(68.29)
2/14/2009	Withdrawal	(100.00)

} Same day

} Same day

What is the balance on Feb 9?

Snapshot fact table

Consider a snapshot fact table ... p 265

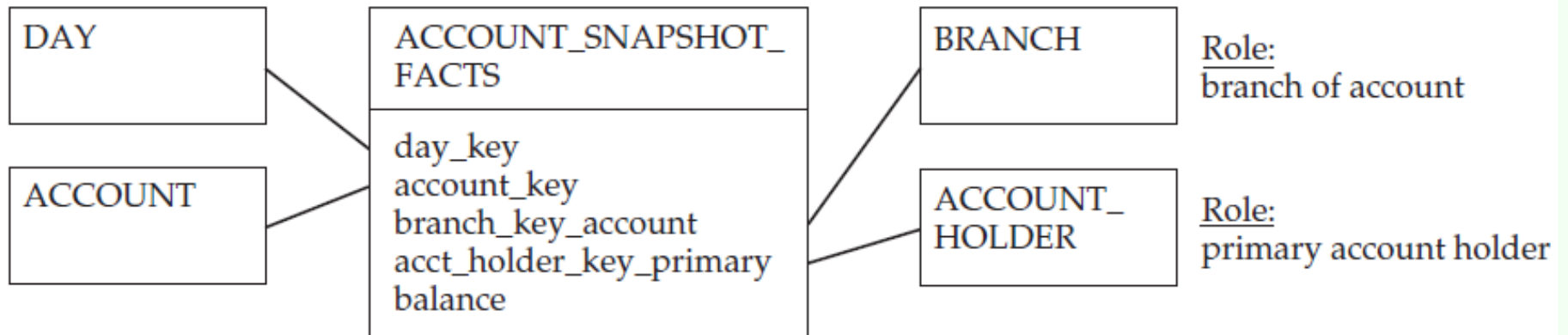


Figure 11-2 A snapshot fact table tracks account status

The balance of each account is recorded in the fact table at the end of each day. There is a measurement for each account on each day – more dense than the transaction fact table

Snapshot fact table

Try to list the balance at the end of day (say Feb 9, 2009) for each account using the snapshot fact table, and also using the transaction fact table – which is easier to code?

Accumulating Snapshot Fact Tables

In order to track an entity through time an accumulating snapshot fact table is useful.

Consider :

Students as they process through a degree,

Mortgage applications,

Purchases from order through to delivery ...

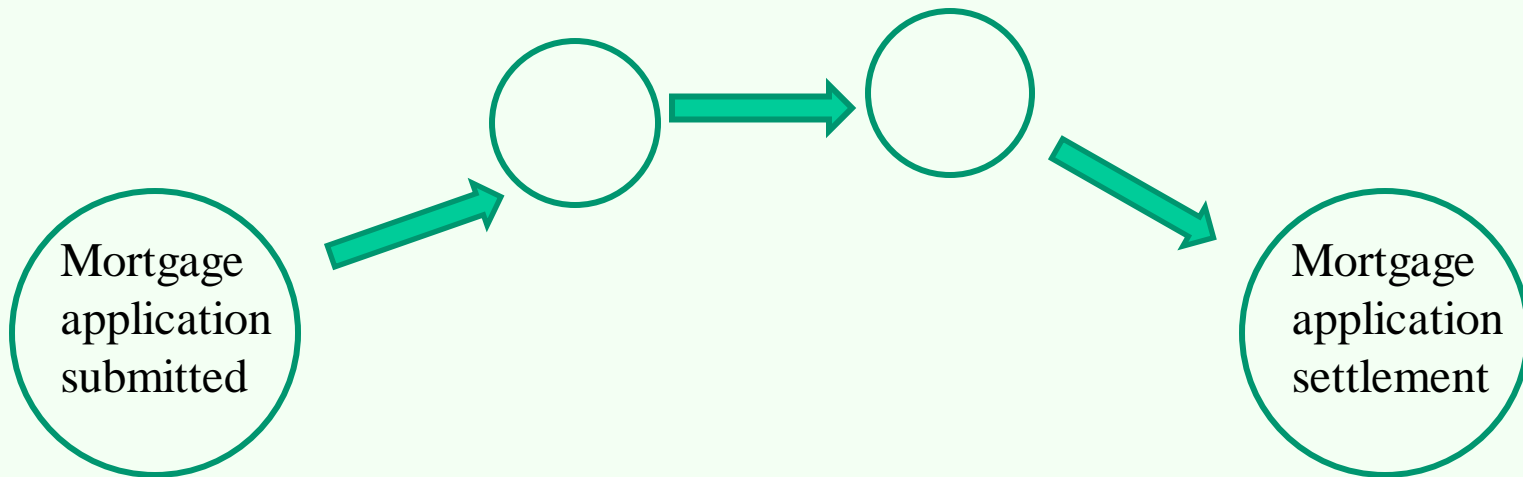
Accumulating Snapshot Fact Tables

A student applies, is accepted, registers for a first course,
passes 30 credits, passes 60 credits, passes 90 credits,
graduates ... one row per student

Schema:

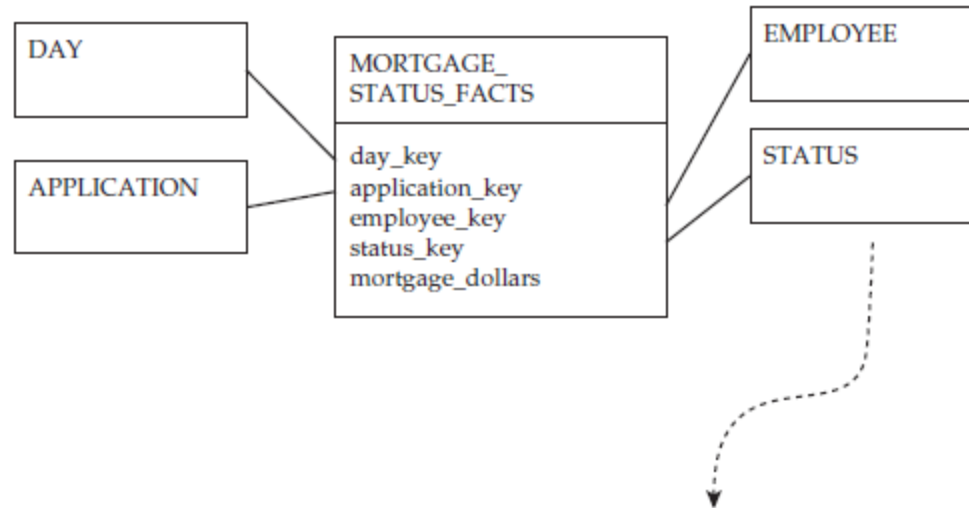
Accumulating Snapshot Fact Tables

Textbook example: mortgage processing, p 275-281



Accumulating Snapshot Fact Tables

transactions



STATUS

status_key	status_code	status	status_description
1000	S1	Submitted	Submitted. Under review by mortgage officer.
1001	A2	Reviewed	Reviewed. Documentation being gathered by processor.
1002	P2	Processed	Processed. Under examination by underwriter.
1003	U2	Underwritten	Underwritten. Awaiting settlement.
1004	EX	Settled	Settled.

Figure 11-5 A transaction fact table captures status changes

Accumulating Snapshot Fact Tables

Tracking
progress via
accumulating
snapshot:
One row per
application

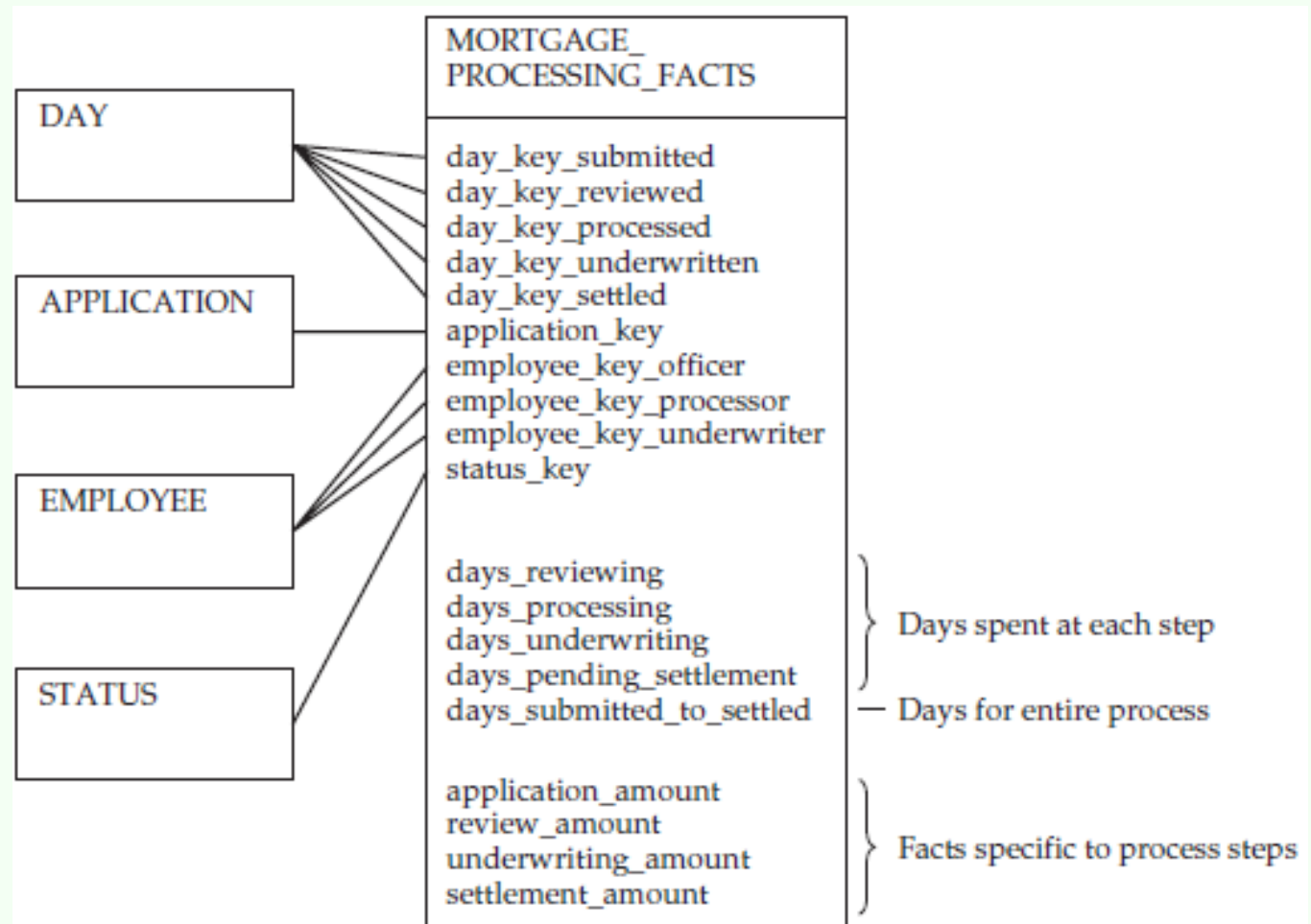


Figure 11-6 An accumulating snapshot with one row per application

Accumulating Snapshot Fact Tables

Each time an application reaches a milestone a row can be updated

On Day 1 (Submitted; under review by officer):

application_key	day_key_submitted	day_key_reviewed	day_key_processed	day_key_underwritten	day_key_closing	application_amount	review_amount	underwriting_amount	days_reviewing	days_processing	...
1011	1021	0000	0000	0000	0000	100,000	0	0	0	0	

Day 2 (No status change):

application_key	day_key_submitted	day_key_reviewed	day_key_processed	day_key_underwritten	day_key_closing	application_amount	review_amount	underwriting_amount	days_reviewing	days_processing	...
1011	1021	0000	0000	0000	0000	100,000	0	0	1	0	

Days 3-9 (not shown)...

Day 10 (Reviewed; documents being gathered by processor):

application_key	day_key_submitted	day_key_reviewed	day_key_processed	day_key_underwritten	day_key_closing	application_amount	review_amount	underwriting_amount	days_reviewing	days_processing	...
1011	1021	1031	0000	0000	0000	100,000	90,000	0	9	0	

Day 11 (No status change):

application_key	day_key_submitted	day_key_reviewed	day_key_processed	day_key_underwritten	day_key_closing	application_amount	review_amount	underwriting_amount	days_reviewing	days_processing	...
1011	1021	1031	0000	0000	0000	100,000	90,000	0	9	1	

Remaining steps...

Figure 11-7 Evolution of a row in an accumulating snapshot

Accumulating Snapshot Fact Tables

Using the accumulating snapshot

e.g. average processing time for applications in January 2009

```
SELECT avg( days_processing )  
FROM mortgage_processing_facts, day  
WHERE  
mortgage_processing_facts.day_key_processed = day.day_key  
AND  
day.month = "January"  
AND  
day.year = 2009
```

Accumulating Snapshot Fact Tables

Using the accumulating snapshot
e.g. the average time spent reviewing and processing an application
in January 2009:

```
SELECT avg( days_reviewing + days_processing )  
FROM mortgage_processing_facts, day AS day_processed  
WHERE  
mortgage_processing_facts.day_key_processed = day_processed.day_key  
AND  
day_processed.month = "January"  
AND  
day_processed.year = 2009
```