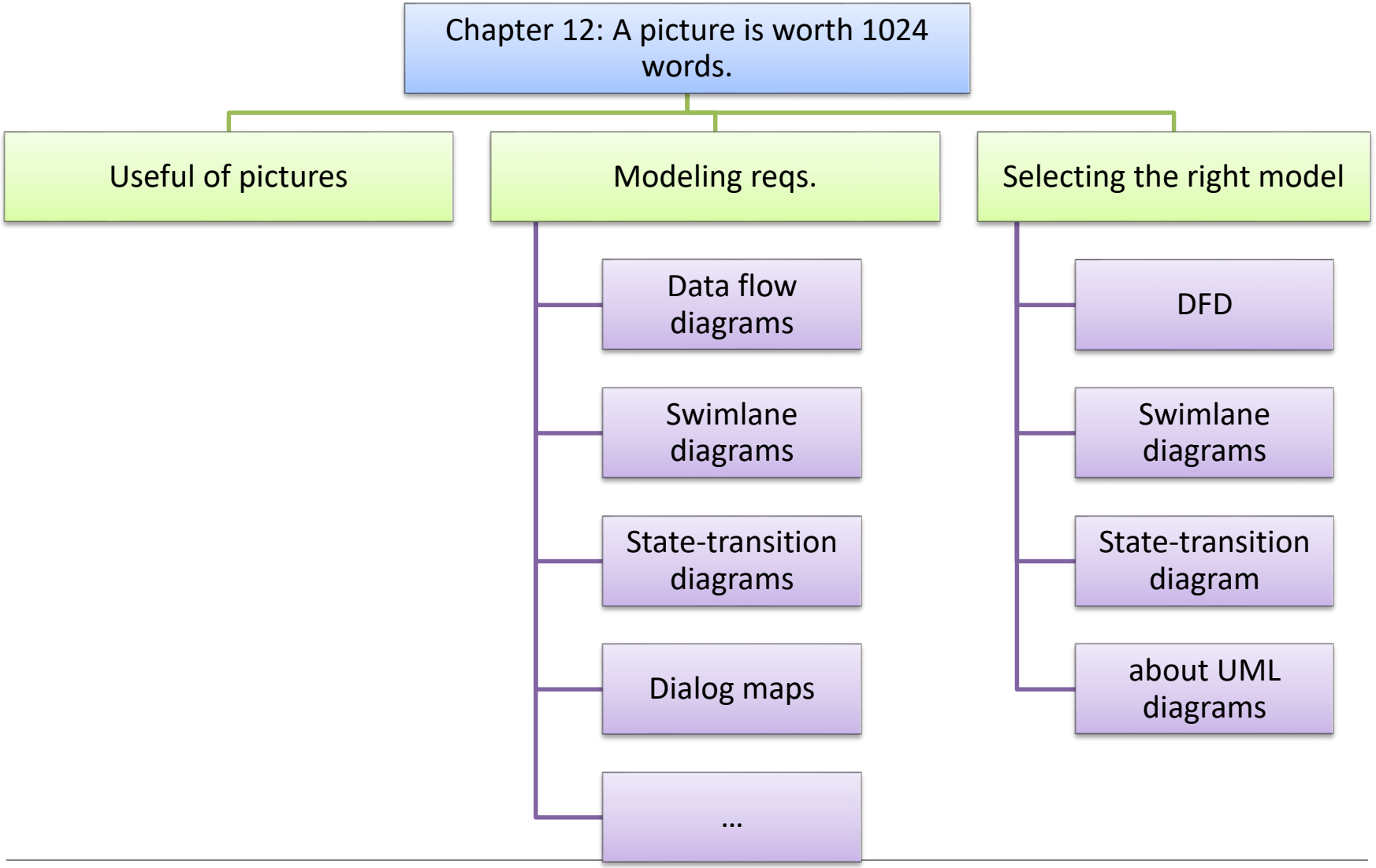
FPT UNIVERSITY

ĐẠI HỌC FPT CẦN THƠ

CHAPTER 13

Specifying data requirements

Review chapter 12



Objectives

- Student should enhance the ways to explore and represent the data.
- Student understand the ways to specify any reports or dashboards of application needs to generate.

Contents

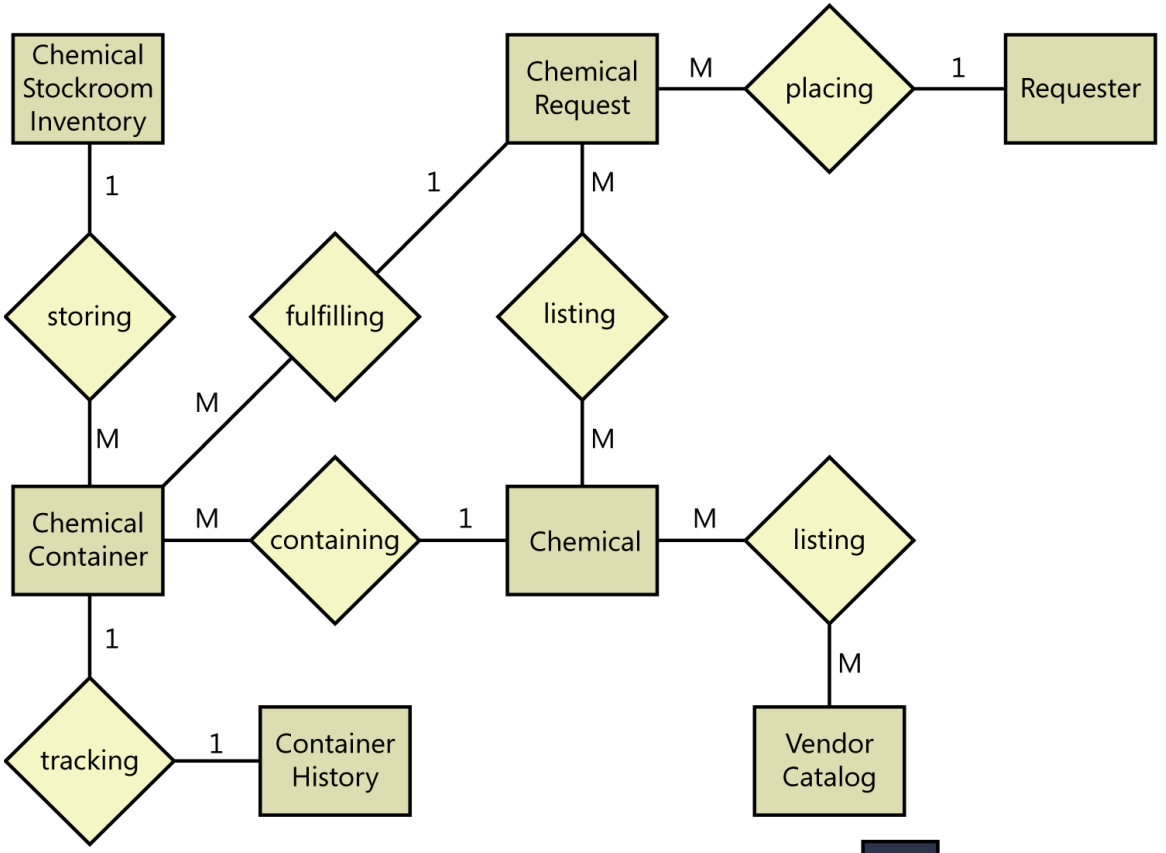
1. Modeling data relationships
2. The data dictionary
3. Data analysis
4. Specifying reports
5. Dashboard reporting

Modeling data relationships

- A commonly used data model is the *entity-relationship diagram* or ERD. If your ERD represents logical groups of information from the problem domain and their interconnections, you're using the ERD as a requirements analysis tool.
- When you create an ERD during design, you're defining the logical or physical (implementation) structure of the system's database.
- That implementation view extends or completes the understanding of the system begun during analysis and optimizes its realization in, say, a relational database environment.
- *Entities* could represent (đại diện) physical items (including people) or aggregations of data that are important to the business you're analyzing or to the system you intend to build. Entities are named as singular nouns and are shown in rectangles in an ERD.

Modeling data relationships

- The entities named Chemical Request, Vendor Catalog, and Chemical Stockroom Inventory appeared as data stores in the data flow diagram
- Other entities represent actors who interact with the system (Requester), physical items that are part of the business operations (Chemical Container).
- *During physical database design of a relational database, entities normally become tables.*



Modeling data relationships

- Each entity is described by one or more *attributes*; individual instances of an entity will have different attribute values.
- The diamonds in the ERD represent *relationships*, which identify the logical linkages between pairs of entities. Relationships are named in a way that describes the nature of the connection.
  - For example, the relationship between the Chemical Request and the Requester is a *placing* relationship.
- The *cardinality*, or multiplicity, of each relationship is shown with a number or letter on the lines that connect entities and relationships.
  - Ex: Requester can place multiple requests, there's a one-to-many relationship between Requester and Chemical Request.

The data dictionary

- A *data dictionary* is a collection of detailed information about the data entities used in an application.
- Collecting the information about composition, data types, allowed values, and the like into a shared resource identifies the data validation criteria, helps developers write programs correctly, and minimizes integration problems.
- The data dictionary feeds into (góp phần) design in the form of database schemas, tables, and attributes, which ultimately lead to variable names in programs.
- The time you invest in creating a data dictionary will be more than repaid by avoiding the mistakes that can result when project participants have different understandings of the data.
- Maintaining a data dictionary is a serious investment in quality. Data definitions often are reusable across applications, particularly within a product line.

The data dictionary

- *Figure 13-4 illustrates a portion of the data dictionary for the Chemical Tracking System. Organize the entries in the data dictionary alphabetically to make it easy for readers to find what they need.*

Data Element	Description	Composition or Data Type	Length	Values
Chemical Request	request for a new chemical from either the Chemical Stockroom or a vendor	Request ID + Requester + Request Date + Charge Number + 1:10{Requested Chemical}		
Delivery Location	the place to which requested chemicals are to be delivered	Building + Lab Number + Lab Partition		
Number of Containers	number of containers of a given chemical and size being requested	Positive integer	3	
Quantity	amount of chemical in the requested container	numeric	6	
Quantity Units	units associated with the quantity of chemical requested	alphabetic characters	10	grams, kilograms, milligrams, each
Request ID	unique identifier for a request	integer	8	system-generated sequential integer, beginning with 1

Data analysis

- A CRUD matrix is a rigorous data analysis technique for detecting missing requirements.
- *CRUD* stands for *Create*, *Read*, *Update*, and *Delete*. A CRUD matrix correlates (tương quan) system actions with data entities to show where and how each significant data entity is created, read, updated, and deleted.
- EX:

Use Case \ Entity	Order	Chemical	Requester	Vendor Catalog
Place Order	C	R	R	R
Change Order	U, D		R	R
Manage Chemical Inventory		C, U, D		
Report on Orders	R	R	R	
Edit Requesters			C, U	

FIGURE 13-5 Sample CRUD matrix for the Chemical Tracking System.

Specifying reports

- Many applications generate reports from one or more databases, files, or other information sources.
- Reports can consist of traditional tabular presentations of rows and columns of data, charts and graphs of all types, or any combination.
- Exploring the content and format of the reports needed is an important aspect of requirements development.
- Report specification straddles (lưỡng lự) requirements (what information goes into the report and how it is organized) and design (what the report should look like).

Specifying reports

- Eliciting reporting requirements: If you're a BA working with customers on defining reporting requirements for an information system, consider asking questions like the following:
  - What reports do you currently use? (Some reports from an existing system, or manually generated reports from the business, will need to be replicated in the new system.)
  - Which existing reports need to be modified? (A new or revised information system project provides an opportunity to update reports that don't fully meet current needs.)
  - Which reports are currently generated but are not used? (Perhaps you don't need to build those into the new system.)
  - Can you describe any departmental, organizational, or government standards to which reports must conform, such as to provide a consistent look and feel or to comply with a regulation? (Obtain copies of those standards and examples of current reports that meet them.)

Specifying reports

- Following are some questions to explore for each customer-requested report:
  - What is the name of the report?
  - What is the purpose or business intent of the report?
  - Is the report generated manually? If so, how frequently and by which user classes?
  - Is the report generated automatically? If so, how frequently and what are the triggering conditions or events?
  - What are the typical and maximum sizes of the report?
  - What is the disposition (bố trí) of the report after it is generated? Is it displayed on the screen, sent to a recipient, exported to a spreadsheet, or printed automatically? Is it stored or archived somewhere for future retrieval?
  - Are there security, privacy, or management restrictions that limit the access of the report to specific individuals or user classes, or which restrict the data that can be included in the report depending on who is generating it? Identify any relevant business rules concerning security.

Specifying reports

- The following questions will elicit information about the report itself:
  - What are the sources of the data and the selection criteria for pulling data from the repository?
  - What parameters are selectable by the user?
  - What calculations or other data transformations are required?
  - What are the criteria for sorting, page breaks, and totals?
  - How should the system respond if no data is returned in response to a query when attempting to generate this report?
  - Can this report be used as a template for a set of similar reports?

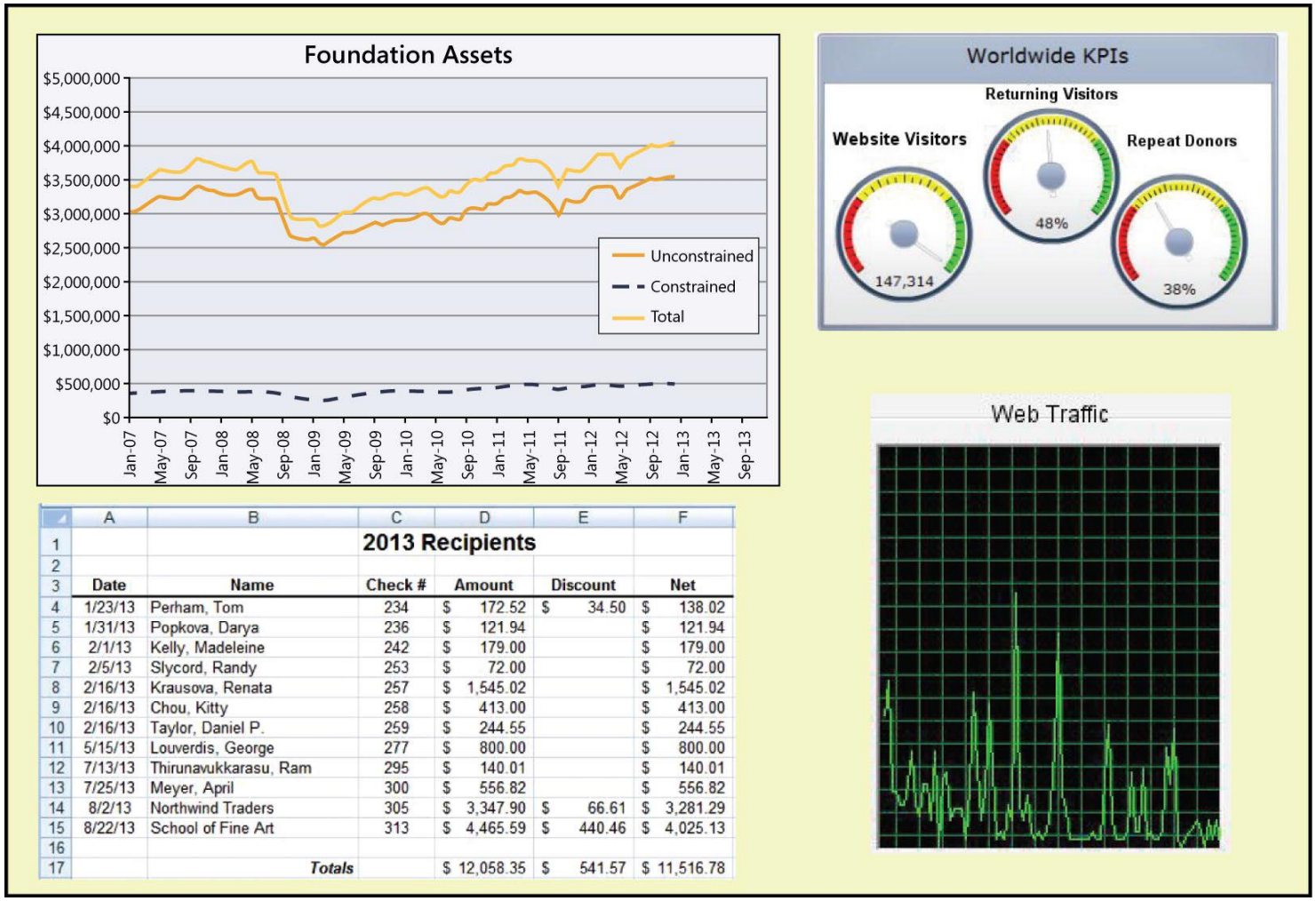
Specifying reports

- Report specification considerations
  - Consider other variations
  - Find the data
  - Anticipate growth
  - Look for similarities
  - Distinguish static and dynamic reports
  - Prototype reports
- A report specification template: page 255

Dashboard reporting

- A *dashboard* is a screen display or printed report that uses multiple textual and/or graphical representations of data to provide a consolidated, multidimensional view of what is going on in an organization or a process.
- Purpose
  - pull together information about sales, expenses, key performance indicators (KPIs), and the like.
  - Stock trading (giao dịch chứng khoán) applications display a bewildering (bối rối) (to the novice) array of charts and data that the skilled eye (con mắt nhà nghề) can scan and process at a glance (nháy mắt).
- How to build:
  - Determine what information the dashboard users need for making specific decisions or choices.
  - Identify the sources of all the data to be presented so you can ensure that the application has access to those feeds (nguồn cấp dữ liệu) and you know whether they are static or dynamic.
  - Choose the most appropriate type of display for each set of related data. Should it appear as a simple table of data, a modifiable spreadsheet containing formulas, blocks of text, bar chart, pie chart, line chart, video display, or one of many other ways to present information?
  - Determine the optimal layout and relative sizing of the various displays in the dashboard, based on how the user will absorb and apply the information.

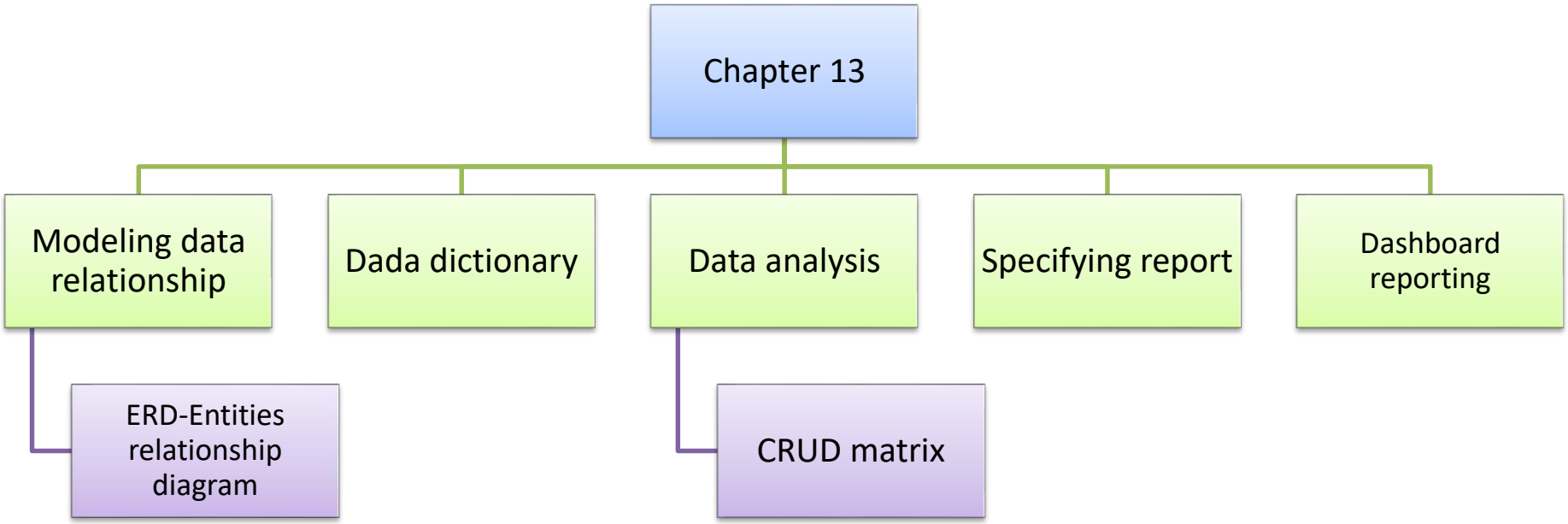
Dashboard reporting



	A	B	C	D	E	F
1			2013 Recipients			
2						
3	Date	Name	Check #	Amount	Discount	Net
4	1/23/13	Perham, Tom	234	$ 172.52	$ 34.50	$ 138.02
5	1/31/13	Popkova, Darya	236	$ 121.94		$ 121.94
6	2/1/13	Kelly, Madeleine	242	$ 179.00		$ 179.00
7	2/5/13	Slycord, Randy	253	$ 72.00		$ 72.00
8	2/16/13	Krausova, Renata	257	$ 1,545.02		$ 1,545.02
9	2/16/13	Chou, Kitty	258	$ 413.00		$ 413.00
10	2/16/13	Taylor, Daniel P.	259	$ 244.55		$ 244.55
11	5/15/13	Louverdis, George	277	$ 800.00		$ 800.00
12	7/13/13	Thirunavukkarasu, Ram	295	$ 140.01		$ 140.01
13	7/25/13	Meyer, April	300	$ 556.82		$ 556.82
14	8/2/13	Northwind Traders	305	$ 3,347.90	$ 66.61	$ 3,281.29
15	8/22/13	School of Fine Art	313	$ 4,465.59	$ 440.46	$ 4,025.13
16						
17		*Totals*		$ 12,058.35	$ 541.57	$ 11,516.78

Hypothetical reporting dashboard for a charitable foundation.

Review chapter 13



THE END
THANK YOU!