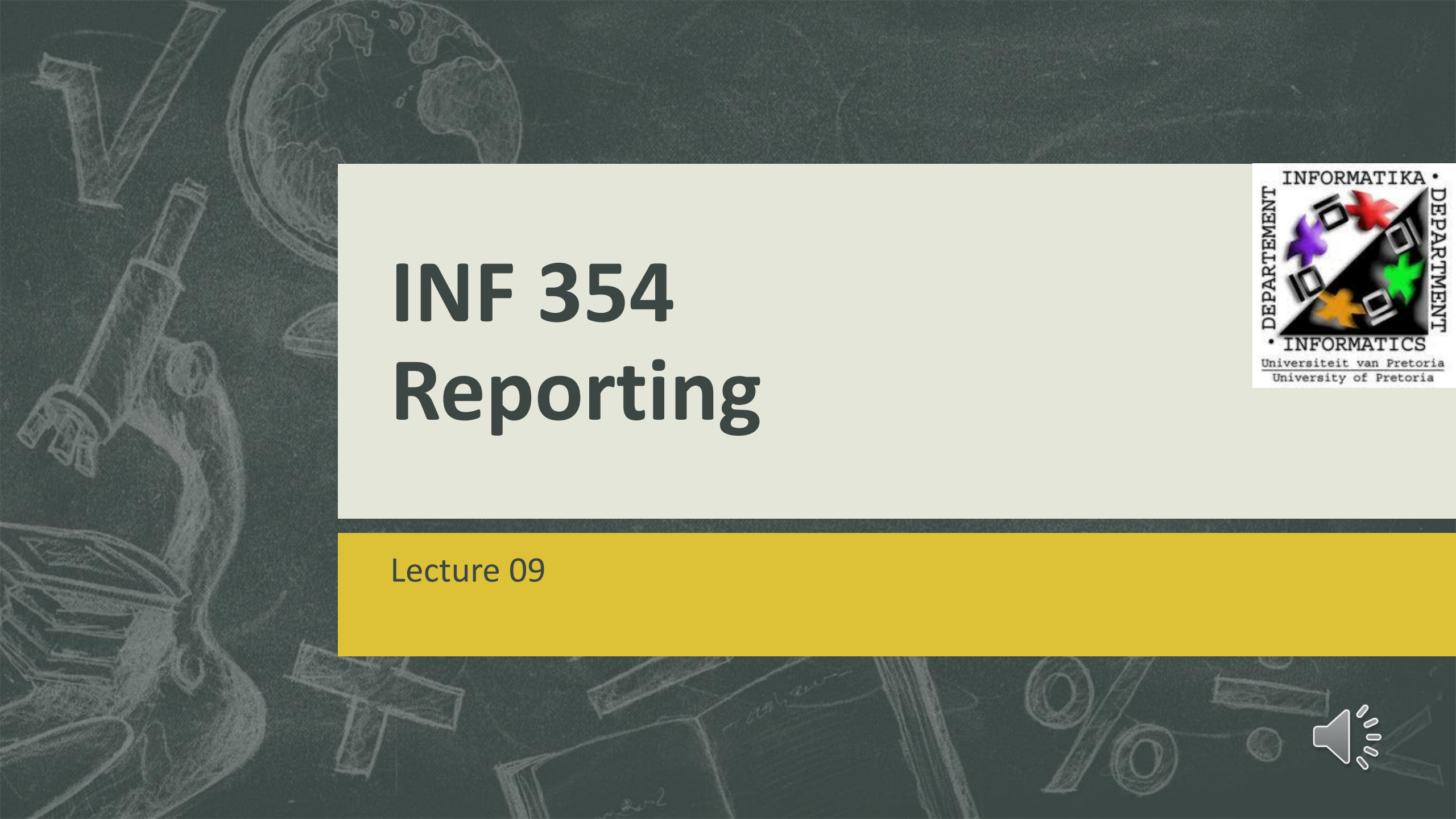
INF 354 Reporting

Lecture 09



The contents of this lecture are as follows:

- Introduction to reporting
- Why do reporting
- Report types
- Steps to generate a report
- Important report design considerations
- How to generate on screen report in Angular
- How to generate downloadable report in Angular
  - using jsPDF and jsPDF-autotable

Introduction to reporting

- Information systems (IS) are formal, sociotechnical, organisational systems designed to collect, process, store, and distribute information to help an organisation to answer questions and solve problems relevant to the mission of the organisation.
- Computer-based or digital information systems are organised integrations of hardware and software technologies developed so that the above mentioned objectives of information systems can be achieved more efficiently.
- Any specific information system aims to support operations, management and decision-making.
- An essential kind of **output** that any information system should offer is **reporting** that can present detailed and aggregated data, which facilitates analysis and decision making

Why do reporting

- Reports help organisations make better decisions by analysing data and trends rather than basing it on “gut feel”.
- The availability of automated reports avoids the need for manual effort to produce reports.
- Reporting can improve management effectiveness.
- Reporting can improve an organisation’s responsiveness to issues.
- Reporting can optimise resource allocation and usage across organisational operations.

Report types

- Summary reports - Summary reports aggregate data by accounting periods, geographic regions, business units or product categories. The reports consolidate information in a format that makes it easy for managers to review and analyse.
- Trend reports - Trend reports allow managers to compare the performance of business units or product categories over time.
- Exception reports - An exception refers to data that are outside of normal ranges. Exception reports aggregate these unusual conditions and present them separately. A timely reporting of exception conditions makes it easier for a manager to isolate cases that require immediate attention.
- Ad hoc reports - On-demand reports provide specific information as and when needed.

Steps to generate a report

Collect parameters

- User enters criteria to impose conditions on report.
- For example, provide a date range.

Retrieve data

- Data is fetched from DB based on conditions.
- Data is staged in memory in a structure that will simplify the rendering of the report.

Render report

- Data is presented in a comprehensible, easy-to-read way.
- Multiple possible formats
- Multiple possible visualisation styles.

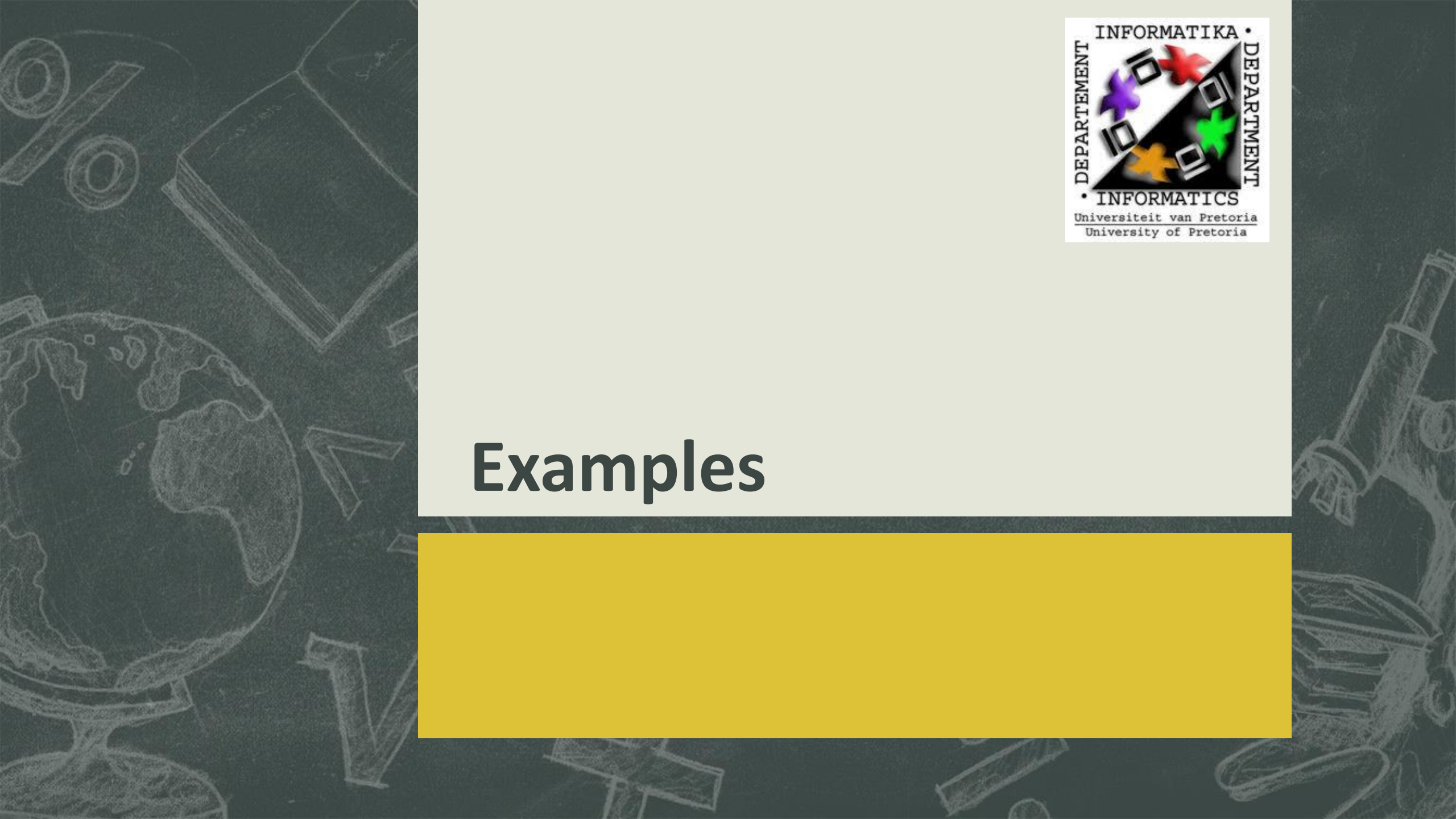
Important report design considerations

1. Format
   - On-Screen
   - Downloadable (PDF, Word, or image formats)



2. Visualisation Styles
   - Tabular – data displayed in a table with rows/columns for subtotals and totals.
   - Graphic – data displayed graphically, for example a chart
   - Hybrid – charts and tables can be combined to create reports with richer information.
   - Dashboard
     - a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.
     - a day-to-day view of key performance indicators
     - provides the navigation point to detailed reports.

3. Calculated information
   - Control breaks - control break reporting is a properly nested set of reports, each of which has localized subtotals. The details add up to a deeply nested subtotal. The subtotals add up to higher and higher level totals, and the top-level totals add to a grand total.
   - Aggregation - groups of records or data points are replaced with summarised values.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INFORMATICS
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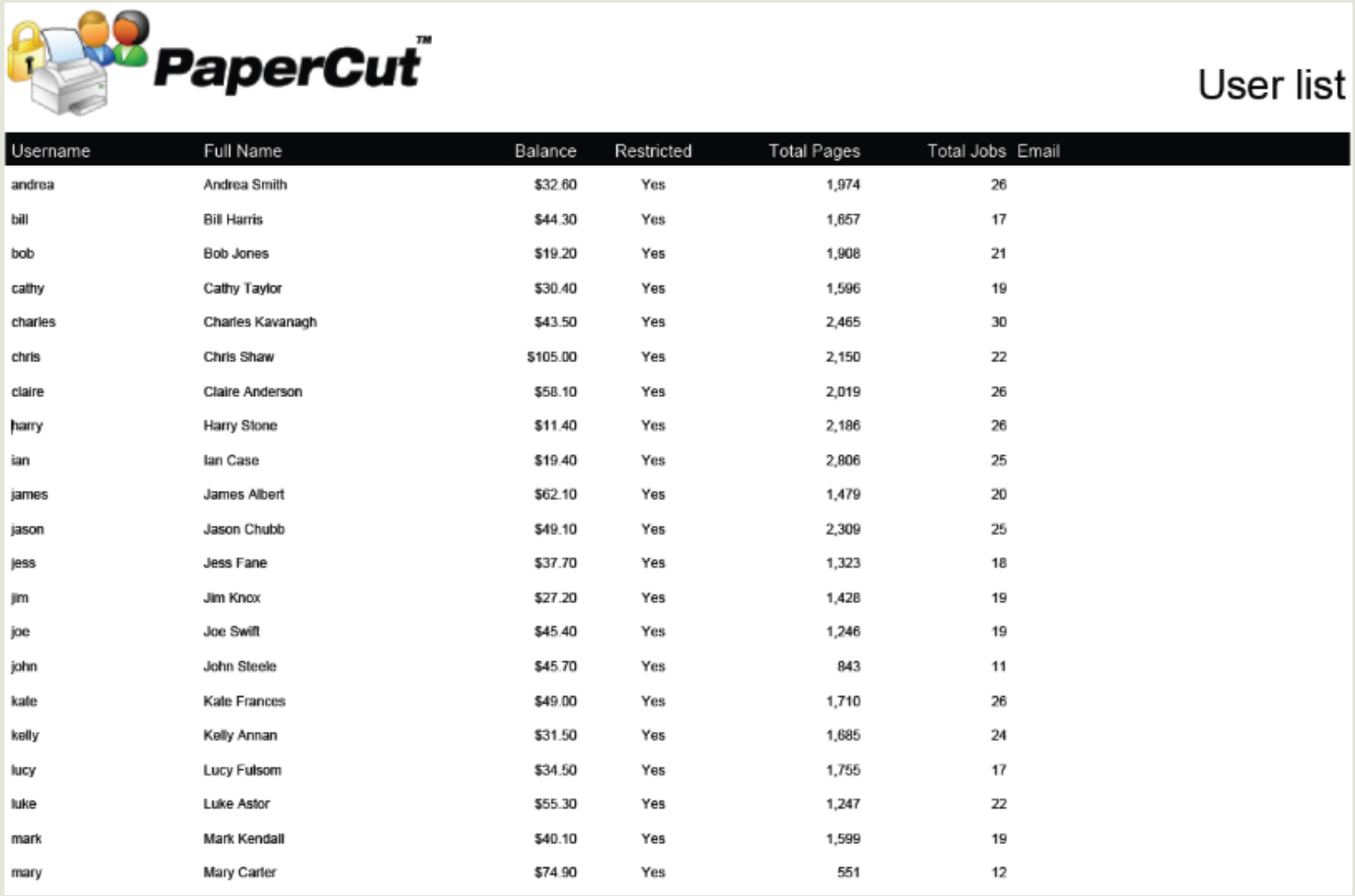
University of Pretoria

Examples

Simple tabular report



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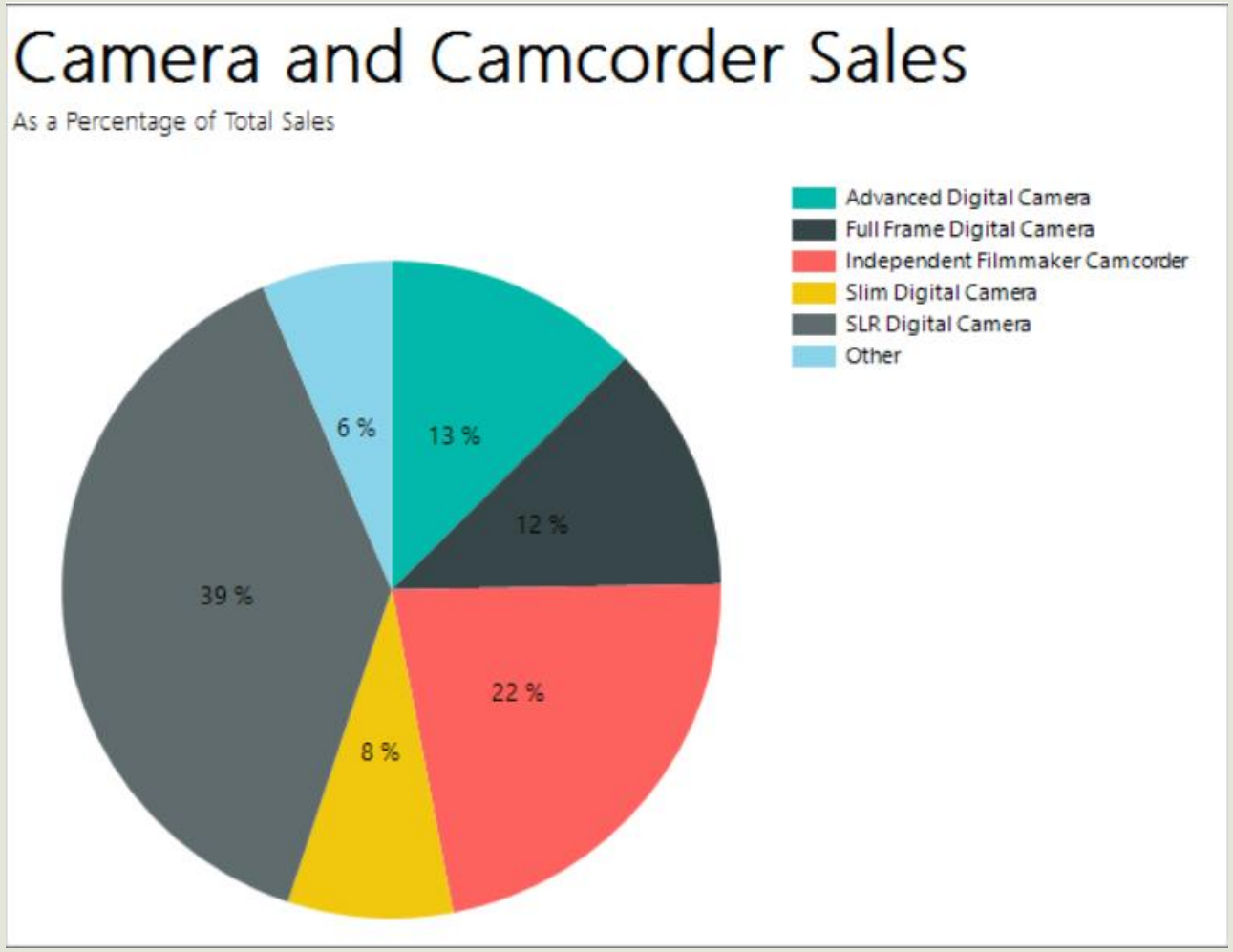
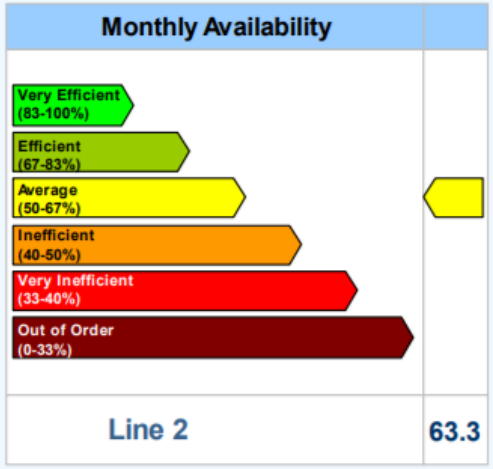
User list

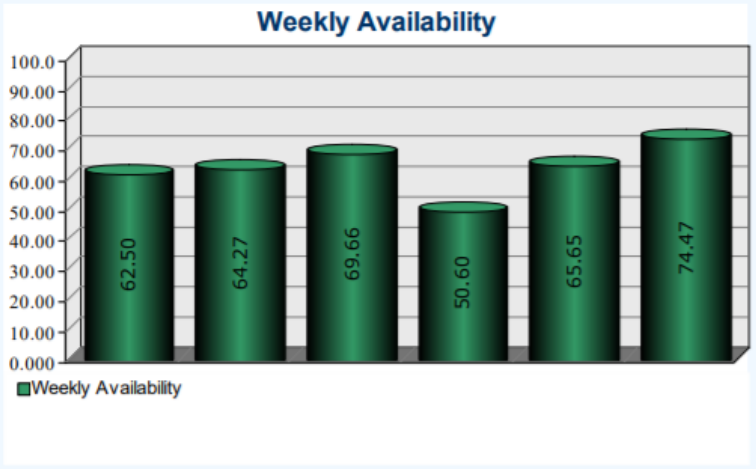
Username	Full Name	Balance	Restricted	Total Pages	Total Jobs	Email
andrea	Andrea Smith	$32.60	Yes	1,974	26	
bill	Bill Harris	$44.30	Yes	1,657	17	
bob	Bob Jones	$19.20	Yes	1,908	21	
cathy	Cathy Taylor	$30.40	Yes	1,596	19	
charles	Charles Kavanagh	$43.50	Yes	2,465	30	
chris	Chris Shaw	$105.00	Yes	2,150	22	
claire	Claire Anderson	$58.10	Yes	2,019	26	
harry	Harry Stone	$11.40	Yes	2,186	26	
ian	Ian Case	$19.40	Yes	2,806	25	
james	James Albert	$62.10	Yes	1,479	20	
jason	Jason Chubb	$49.10	Yes	2,309	25	
jess	Jess Fane	$37.70	Yes	1,323	18	
jim	Jim Knox	$27.20	Yes	1,428	19	
joe	Joe Swift	$45.40	Yes	1,246	19	
john	John Steele	$45.70	Yes	843	11	
kate	Kate Frances	$49.00	Yes	1,710	26	
kelly	Kelly Annan	$31.50	Yes	1,685	24	
lucy	Lucy Fulsom	$34.50	Yes	1,755	17	
luke	Luke Astor	$55.30	Yes	1,247	22	
mark	Mark Kendall	$40.10	Yes	1,599	19	
mary	Mary Carter	$74.90	Yes	551	12	

Simple graphic/chart report



Hybrid report – chart + table

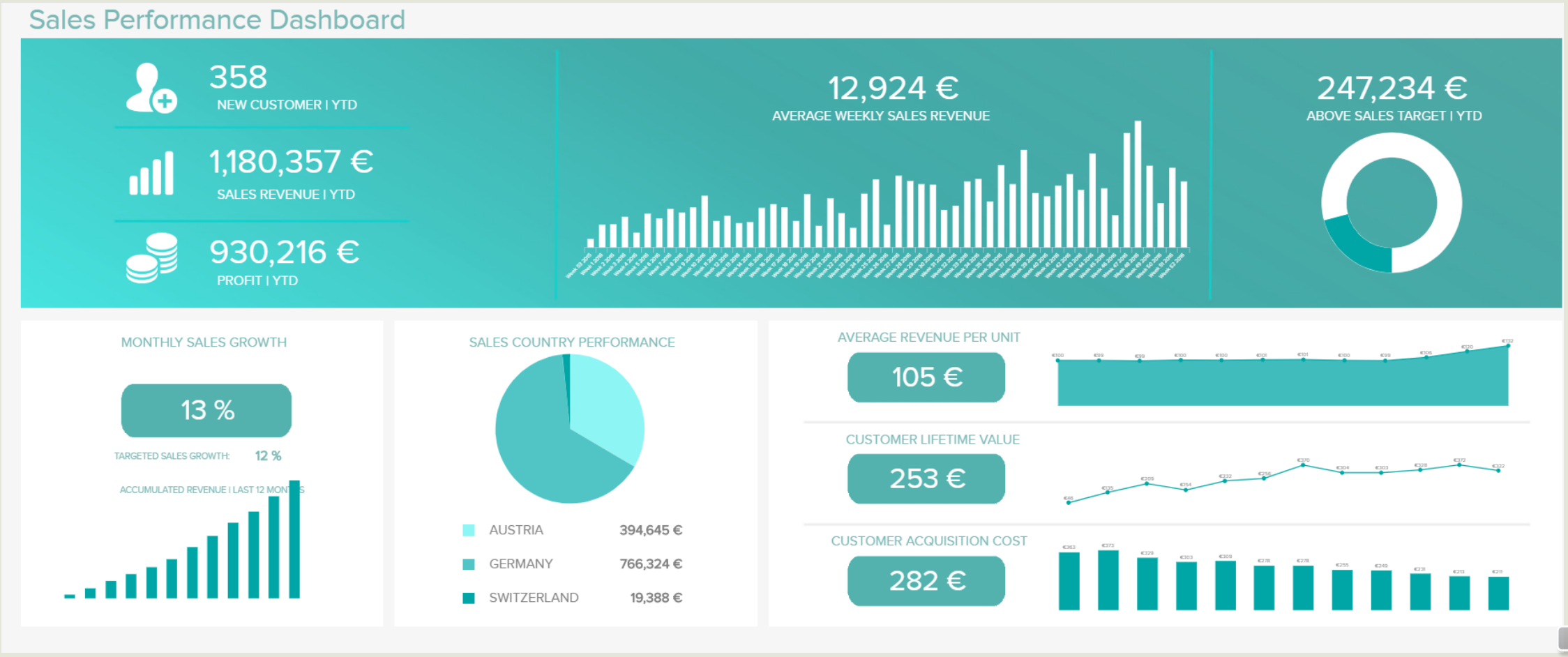




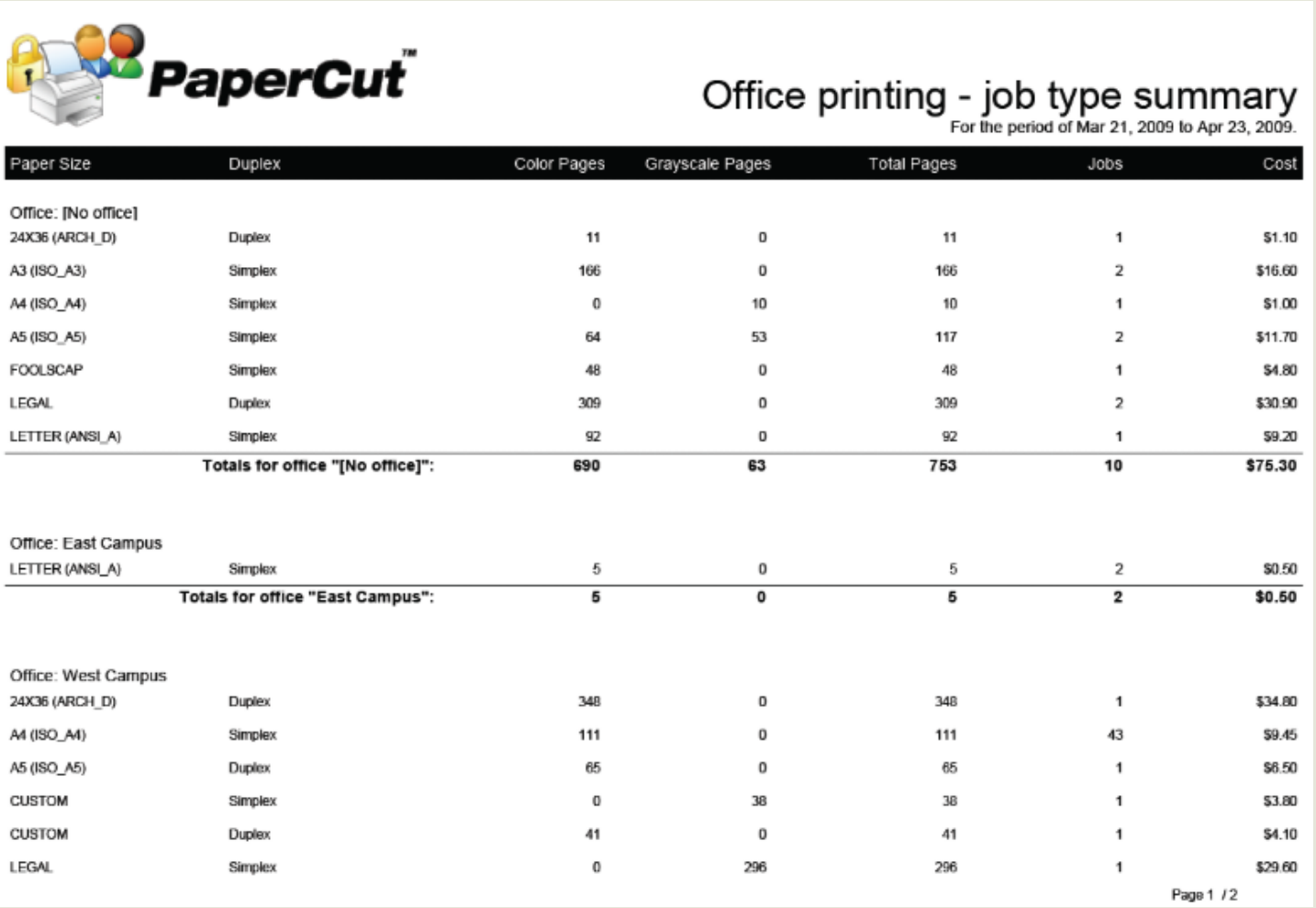
Weekly Availability Information

Date	Running TIme	Down Time	Availability, %
01/01/2012	15:00:01	8:59:59	63 %
02/01/2012	107:58:24	60:01:36	64 %
09/01/2012	117:01:59	50:58:01	70 %
16/01/2012	85:00:00	83:00:00	51 %
23/01/2012	110:17:05	57:42:55	66 %
30/01/2012	36:00:00	12:00:00	75 %
Total Min	**15:00:01**	**8:59:59**	**50.60**
Total Max	**117:01:59**	**83:00:00**	**75.00**
Total Avg	**78:32:54**	**45:27:05**	**64.61**
Total Monthly:	**471:17:29**	**272:42:31**	

Dashboard


Sales Performance Dashboard
358
NEW CUSTOMER | YTD
1,180,357 €
SALES REVENUE | YTD
930,216 €
PROFIT | YTD
12,924 €
AVERAGE WEEKLY SALES REVENUE
247,234 €
ABOVE SALES TARGET | YTD
MONTHLY SALES GROWTH
13 %
TARGETED SALES GROWTH: 12 %
ACCUMULATED REVENUE | LAST 12 MONTHS
SALES COUNTRY PERFORMANCE
AUSTRIA 394,645 €
GERMANY 766,324 €
SWITZERLAND 19,388 €
AVERAGE REVENUE PER UNIT
105 €
CUSTOMER LIFETIME VALUE
253 €
CUSTOMER ACQUISITION COST
282 €

Control breaks



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Office printing - job type summary

For the period of Mar 21, 2009 to Apr 23, 2009.

Paper Size	Duplex	Color Pages	Grayscale Pages	Total Pages	Jobs	Cost
Office: [No office]						
24X36 (ARCH_D)	Duplex	11	0	11	1	$1.10
A3 (ISO_A3)	Simplex	166	0	166	2	$16.60
A4 (ISO_A4)	Simplex	0	10	10	1	$1.00
A5 (ISO_A5)	Simplex	64	53	117	2	$11.70
FOOLSCAP	Simplex	48	0	48	1	$4.80
LEGAL	Duplex	309	0	309	2	$30.90
LETTER (ANSI_A)	Simplex	92	0	92	1	$9.20
	Totals for office "[No office]":	**690**	**63**	**753**	**10**	**$75.30**
Office: East Campus						
LETTER (ANSI_A)	Simplex	5	0	5	2	$0.50
	Totals for office "East Campus":	**5**	**0**	**5**	**2**	**$0.50**
Office: West Campus						
24X36 (ARCH_D)	Duplex	348	0	348	1	$34.80
A4 (ISO_A4)	Simplex	111	0	111	43	$9.45
A5 (ISO_A5)	Duplex	65	0	65	1	$6.50
CUSTOM	Simplex	0	38	38	1	$3.80
CUSTOM	Duplex	41	0	41	1	$4.10
LEGAL	Simplex	0	296	296	1	$29.60

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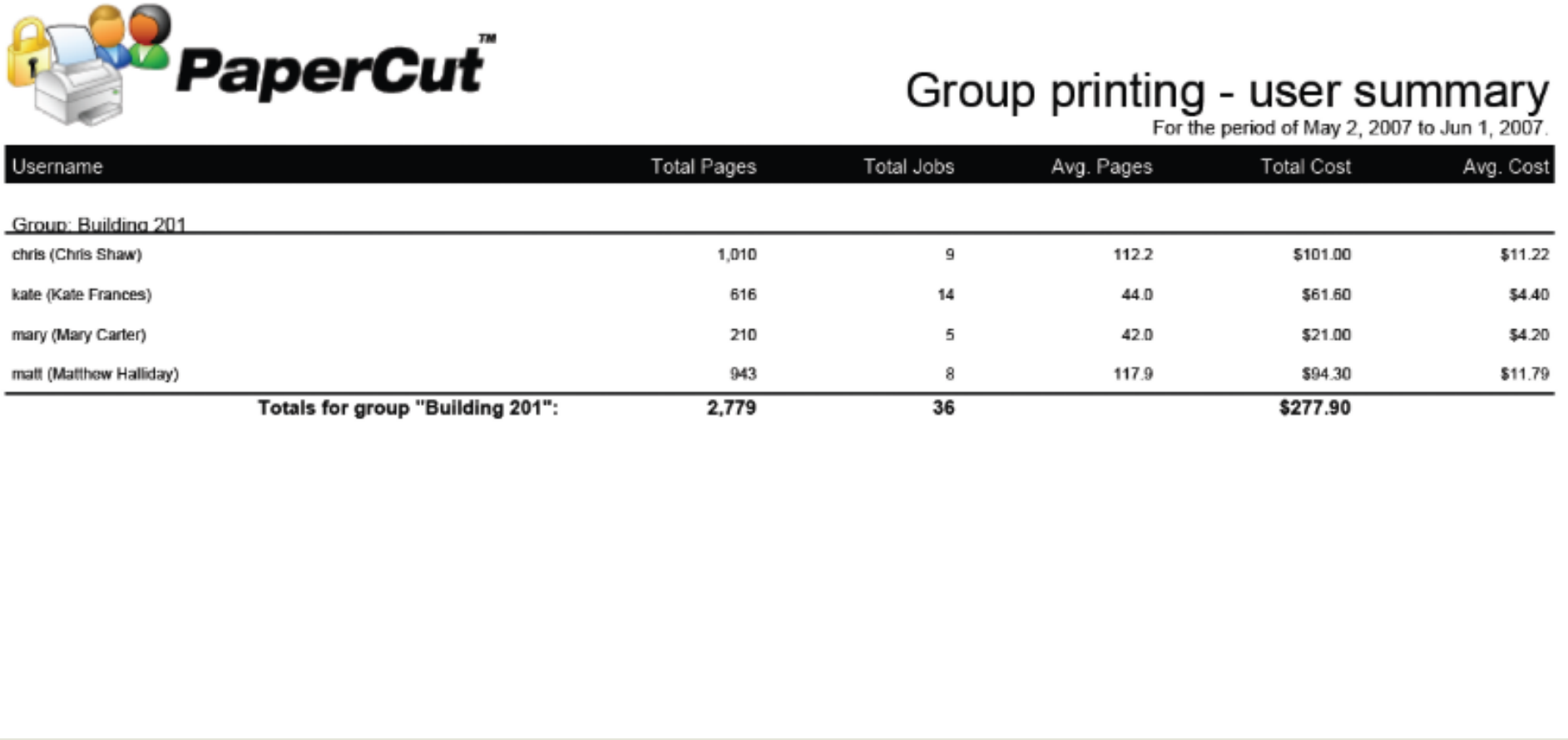
Aggregation



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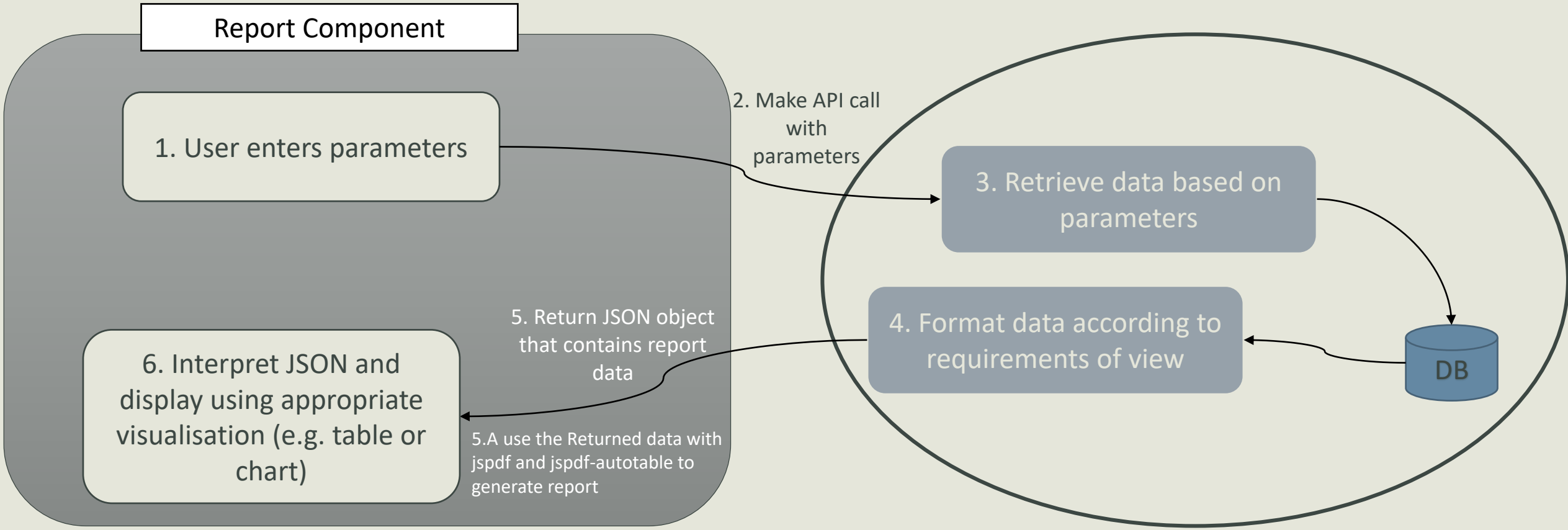
Group printing - user summary

For the period of May 2, 2007 to Jun 1, 2007.

Username	Total Pages	Total Jobs	Avg. Pages	Total Cost	Avg. Cost
Group: Building 201					
chris (Chris Shaw)	1,010	9	112.2	$101.00	$11.22
kate (Kate Frances)	616	14	44.0	$61.60	$4.40
mary (Mary Carter)	210	5	42.0	$21.00	$4.20
matt (Matthew Halliday)	943	8	117.9	$94.30	$11.79
Totals for group "Building 201":	**2,779**	**36**		**$277.90**	

Reporting in Angular

On Screen Report



View

API

Chart.js

- A simple and flexible charting JavaScript library.
- Chart.js is an open source, community maintained project (completely free!)
- Renders charts across all modern browsers (IE11+) because it outputs charts as custom HTML 5 Canvas Elements
- Redraws charts on window resize for responsiveness.
- To install in angular simply run the command:
  - npm install -g chart.js

jsPDF & jsPDF-AutoTable

- A simple and flexible JavaScript library.
- jsPDF is used with HTML 5 to give an elegant solution to produce PDFs for reports, certificates and more.
- It can work with Images and with jsPDF-AutoTable adds functionality for tables in HTML
- To install jsPDF & jsPDF-AutoTable you follow the following commands:
  - npm install -g jspdf jspdf-autotable –save
  - After it is installed at the following line to your “angular.json” file under the scripts tag
  - ["node_modules/jspdf/dist/jspdf.min.js,
    "node_modules/jspdf-autotable/dist/jspdf.plugin.autotable.js"].
- Next page importing on angular will be shown

jsPDF & jsPDF-AutoTable (Continued)

- To import the files in angular it will look like the following

```
import * as jsPDF from 'jspdf';
import 'jspdf-autotable';
```

- You add the above imports at the top of your document
- You can now start using the libraries and begin your document
  - *var* doc = new jsPDF();
  - doc.autoTable({html: '#my-table'});
  - If you want to learn more visit http://raw.githack.com/MrRio/jsPDF/master/docs/ to access jspdf's documentation.

Video

- Video will be uploaded in the same folder as the slides for a more practical example of how to work with reports

- Alternative video for reporting in angular
  - https://www.youtube.com/watch?v=RTzi5DS7On4

Conclusion

- Reporting is an essential part of any software application.
- Managers depend on reporting to make operational, tactical and strategic decisions.
- There are several powerful reporting libraries that can be used to build useful and professional reports in Angular Applications (unfortunately, you have to pay)
- In this lecture, we demonstrated how to follow a bare bones (free) approach to reporting. In industry, it is more likely that you'll use a proprietary library.