Data Graphs for Legal Management

A competitive advantage for decisions

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Altman Weil, Inc.

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Contents

Dedications

For all that can't be quantified, I dedicate this primer to my wonderful wife, Anne Kennedy, and children: Drew, Michelle, Kit, and Will.

For that which can be quantified, I dedicate this primer to all the amazing people who created, nurtured, and continually improve the R programming environment.

Thank You's

I would also like to acknowledge and thank Michael Andrec, PhD, for his years of helping and teaching me R programming, mathematics, and plotting. Additionally, a number of other friends have offered advice on this primer: Rudy Engholm, Bruce Heintz, Paul Morrison, Bill Speros, and Jim Jones with his copious and thoughtful suggestions. My partner, Jim Wilber, provided diligent and careful editorial suggestions. My partners Tom Clay and Jim Cotterman offered several useful comments. All infelicities and mistakes, however, are mine.

Legal Matter

This primer is entirely my own creation and in no way should it be read as reflecting the opinions or beliefs of Altman Weil, Inc. or its Principals. It is also a work in process.

I Would Like Your Feedback!

Please write me as I very much want to hear from readers. Let me know your comments regarding typos, errors, confusing statements, omissions, or whatever I might do to improve this primer: **rees@reesmorrison.com**.

1 Why You Should Make Use of This Book

This primer[1] aims to expand awareness of what data law firms have that will help their leaders make better decisions. It highlights a multitude of data types, how to present them in a wide variety of graphical forms, and how to interpret the graphs so that decisions improve.

Whom this primer will help, and how

This primer has value for a variety of constituencies in a law firm, although some parts of the primer will be more relevant to people in certain roles. We should also emphasize that this primer has much value for law departments of corporations. Many of the plots could have a law department counterpart-plot. But, for ease of presentation we have focused on law firms and their data.

- **Managing Partners**: Leaders can use trend data and insight data to make strategic and longer-term decisions.
- **Executive Team Members**: Heads of functions such as Finance, Human Resources, Marketing and Information Technology can make budgetary decisions, profitability decisions, investment decisions, and the like.
- **Practice Heads**: Practice leaders can make tactical-action decisions on their particular practice group.
- **Office Managing Partners**: Managing partners of offices can make decisions regarding personnel productivity, facilities, and the like.
- **Data Analysts**: Additionally, this primer can be beneficial to anyone who collects and presents data.
- **Anyone Who Needs to Understand Graphics**: If from time to time you need to interpret a graph, this primer will improve your capabilities.

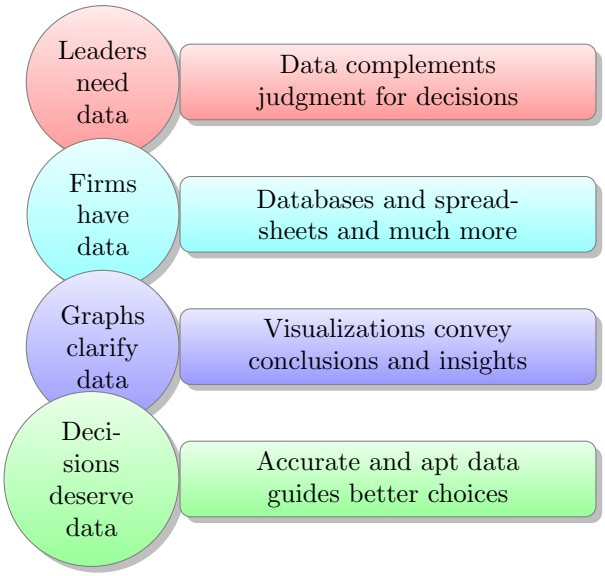
[1] This primer may be purchased at http://leanpub.com/datagraphs4lawfirmMgtDecisions. It was published in June 2017. It is a Leanpub book. Leanpub empowers authors and publishers with the Lean Publishing process. Lean Publishing is the act of publishing an in-progress ebook using lightweight tools and multiple iterations to get reader feedback, revise until you have the right book, and build traction once you do.

2 Ratio Decidendi for This Primer: Data Delivers Decisions and Dollars

Data presented in graphs informs and guides managers, and increasingly will assist those who manage lawyers whether they are partners in law firms or senior lawyers in legal departments. As data and its visual presentation have become ubiquitous, more opportunities arise for lawyers supplied with metrics and effective plots to manage better. Pertinent data collected, analyzed and presented adroitly can strengthen and quicken their decisions and enable them to persuade others more effectively. Put alliteratively, **data delivers decisions and dollars**.

One step with data is to explore it, such as to test how consistent or variable it is, or to understand how predictable it is, or how it compares to other sets of related data. A second step is to present the findings from the deeper understanding of the data that results. This primer concentrates on the second step, graphical presentation of empirical metrics to help legal managers.

We summarize the beliefs that animate this primer in the graphical depiction below and then expand on them in the paragraphs that follow.



2.1 Law firm leaders make decisions about the business operations of their firm

In law firms[2], the term **leaders** includes Managing Partners, heads of practice groups, Chief Marketing Officers, Executive Directors, Chief Operating Officers, Chief Financial Officer, and Chief Information Officers. Others in the firm (or law department) also lead and can benefit from data-based graphs. Moreover, this primer also has much to offer database administrators in law firms and analysts who work with the firm's data and prepare reports. Finally, a wide range of vendors and service providers to law firms, anyone who helps produce or handle law firm data, can benefit from this primer.

The first section of the primer introduces and explains more than 75 analytic charts. The Table of Contents identifies the different kinds of charts presented in this primer by highlighting them in red font. Each chart shows a way law firms can turn the data available to them into visually persuasive and informative graphics. Most of them draw on hypothetical data and illustrate a technique or two that generates effective charts.

[2]Some of the plots in this primer, and all of the message, apply to law departments, but the main thrust focuses on law firms and their operations.

2.2 Leaders make better decisions when they are informed by reliable data

When the Executive Committee or other leaders of a law firm have before them complete and accurate data that tells a story, those leaders are likely to make sounder decisions than if they rely on subjective experience, interpersonal skills, intuition, power or tradition.

Humans are not as rational as they believe they are[3] and data can be an antidote to many imperfections in our reasoning.

2.3 Data is ample in law firms, although sometimes not recognized or collected

What we mean in this primer by *data* is fact that results from something being counted or measured. We cover more than 60 kinds of data in the charts that follow, including fee revenue, numbers of mid-level associates, pro-bono time, competitors' offices, ancillary services' profitability, practice group size, and many more. Some of the data every firm tracks, such as hours billed and fee receipts; other data discussed here may not be comprehensively or carefully recorded by a firm, but could be, such as meetings held with general counsel or the level of the person who retains the firm.

This primer draws on data that could come from many sources, mostly within a law firm but sometimes from outside a firm. The table groups the 66 types of data graphed in this primer by major categories.

Table 1: Sources or Types of Law Firm Data

Clients	**Marketing**	**People**
benchmarks	activities	CAGR staff
concentration	alum	mergers and acquisitions
directing level	client proximity	office open and close dates
domestic or foreign	competitors	associates billable hours
global revenue	competitors offices	associates gender
industries	cross selling	associates law school year
industry size	organizations	associates levels
key	practice groups budgets	associates number
publicly traded	RFPs	associates sources
regulatory load	**Matters**	lawyers engagement
years using firm	cases	lawyers evaluations
Finances	cases duration	lawyers level
accounts payable	numbers	lawyers pro bono time
AFAs	type	of counsel number
ancillary investments	**Practice Groups**	paralegals
billing rates	lawyers	partners mgt hours
client and realization	litigation	partners mrkt hours
client profitability	litigation e-discovery	partners number
days invoice outstanding	revenue	partners sources
fees	**Resources**	partners status change
operating cash sources	e-mails	partners work originate fees
lawyers compensation	knowledge capital	support number and type
profit	tech expenditures	
timekeepers		

[3] On this point, see Daniel Kahneman, Thinking, Fast and Slow (Farrar, Straus and Giroux, 2013).

The primer assumes that readers can collect or create such management data and that they can store that data in spreadsheets. Either spreadsheet software or a wide range of other software can save and export the data for use elsewhere.

For law firms, significant amounts of data repose in their time and billing software, but also in document management systems, calendaring software, telephone logs, expense reports, compensation files, personnel records, CRM databases, and other sources. For general counsel, matter management or e-billing software collects a wide range of numbers and information, and often other repositories come from software similar to that available in law firms or from the company's underlying systems.

Data amassed, and the inevitable cleaning of it completed, it is time to unleash software that translates that data into visually effective graphs.

2.4 Graphs explain data and help leaders learn from data

An effective graph presents data so that the reader of it (the **greader**?) learns something. An effective graph should tell a story and provide background sufficient for the reader to understand the story. This primer uses the open-source R programming language but no knowledge of programming or R is needed to follow the discussions. Nor is R uniquely capable of creating charts like the ones in this primer. Many other programs have excellent plotting capabilities.[4]

Which plot is right for your purposes? From a blog post[5], here are five questions to ask when deciding which chart to use.[6]

1. Do you want to compare values?
   Charts are perfect for comparing one or many value sets, and they can easily show the low and high values in the data sets. To create a comparison chart, use these types of graphs:
   - Column
   - Bar
   - Circular Area
   - Line
   - Scatter Plot
   - Bullet
2. Do you want to show the composition of something?
   Use this type of chart to show how individual parts make up the whole of something, such as the device type used for mobile visitors to your website or total sales broken down by sales rep. To show composition, use these charts:
   - Pie[7]
   - Stacked Bar
   - Stacked Column
   - Area

[4] If you want to install R on your computer you can download for free the latest version for Windows, Linux, or Mac OS from cran.rproject.org. I also recommend that you use RStudio as your integrated development environment (IDE) https://www.rstudio.com/.

[5] https://blog.hubspot.com/marketing/data-visualization-choosing-chartsm.00005ui07yfklepc1030hw3hjvxfv

[6] Additional insights about strengths and weaknesses of various plot types can be found in Antony Unwin, Graphical Data Analysis with R, CRC Press 2015 at pages 46, 53, and 75.

[7] Although both the pie chart and the bar chart help us visualize the distribution of a categorical variable, the pie chart emphasizes how the different categories relate to the whole while the bar chart emphasizes how the different categories compare with each other.

- Waterfall

3. Do you want to understand the distribution of your data?
   Distribution charts help you to understand outliers, the normal tendency, and the range of information in your values. Use these charts to show distribution:

   - Scatter Plot
   - Line
   - Column
   - Bar

4. Are you interested in analyzing trends in your data set?
   If you want to know more information about how a data set performed during a specific time period, there are specific chart types that do extremely well. You should choose a:

   - Line
   - Dual-Axis Line
   - Column

5. Do you want to better understand the relationship between value sets?
   Relationship charts are suited to showing how one variable relates to one or numerous different variables. You could use this to show how something positively effects, has no effect, or negatively effects another variable. When trying to establish the relationship between things, use these charts:

   - Scatter Plot
   - Bubble
   - Line

2.5 Decisions are sounder when data informs the choices and consequences

This primer brings together law firm operational data and graphs that will strengthen decisions. More than 75 plots display nearly as many kinds of law firm data. The index includes under the topic 'Analytic data' the varieties of data illustrated here. The primer organizes the plots under the categories in the following diagram, which should be read counterclockwise starting from 'Clients.'

2.5.1 Each subsection summarize the usefulness of some data, its source, and a graph

A pattern generally holds for the two-page subsections. Under the headings used in each subsection we summarize what they contain.

The Opening Argument

A trenchant sentence or two on why leaders of lawyers should recognize the data discussed and the decisions it pertains to.

Framing the Decision

A paragraph or two explains why firm management should find it advantageous to assemble the particular class of data and prepare plots regarding it. The benefit is always the same: leaders will be able to make better decisions.

Source Sorcery

Next, a paragraph explains where the data might come from and how it might be compiled. The plots also have a caption at the bottom that summarizes the source of the data in the plot, but the captions are more illustrative than definitive.

The Plot Thickens

For readers who are interested in effective graphs and how to create them, this portion focuses on the example plot. Each plot uses mock data from a hypothetical law firm[8] to illustrate how law firm leaders might visualize numbers that are important for them to take account of in making decisions.

The subtitle of each plot asks a question of the kind that managers might want answered from the plot. Of course, the numbers in a plot do not make a decision, but they can and should augment decisions made by humans.

We do not claim that the particular style of graph chosen is optimal for the data in it or that the graph's elements are the best ones that could be chosen. We do claim that the selection of plot type and components is sensible. This section discuss different components of the plot.[9]

To familiarize readers with with the building blocks that are common terms in plotting, which also means the terms used frequently throughout the primer as we discuss the plots, we encourage readers to spend a few minutes absorbing the labelled components of the teaching plot in the Appendix and the terms used to describe them.

For each chart we explain how to read it by citing a data point from it. For the most part, lawyers find the most comfort in words, but have a harder time gleaning insights from tables and plots of numbers. This primer should help increase their comfort with and appreciation for graphs.

Going Plotinum[10]

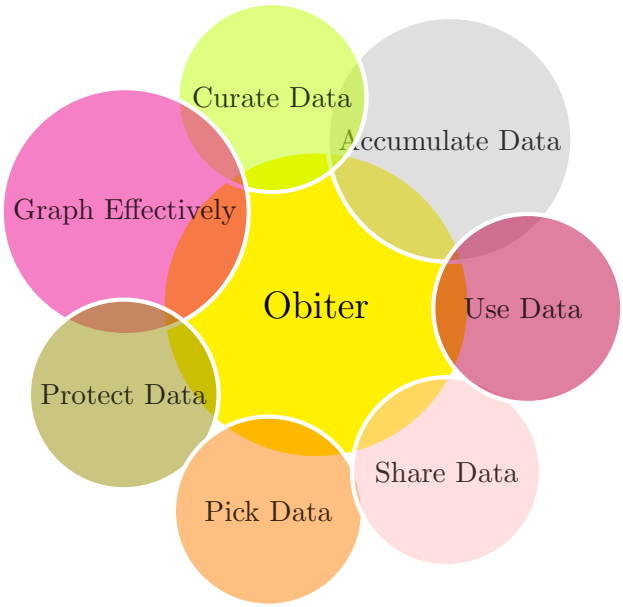
Finally, most pages offer thoughts about how the plot presented in that section could be improved or supplemented.

[8] Roughly speaking, the author had in mind a law firm of about 50 lawyers, four or five practice groups and four or five office locations.

[9] In a later release, we may include R code that creates many plot elements.

[10] Not everyone likes puns, so this one that alludes to records that sell a million copies may be hard to decrypt.

Interspersed throughout the primer is supplemental material. Primarily these are various observations in blue-bordered, grey-background text boxes [the first one is below]. These **Obiter Dicta** go beyond the 'holding' for the particular plot and data at issue. They raise points that apply broadly to the focus of the primer, how data displayed visually can help law firm leaders make better decisions. The image below describes the seven categories of the 40+ Obiter Dicta.



Alert readers will notice that the Table of Contents entry identifies each plot as its primary subject and then adds a semicolon and the plot's secondary topic.

The index consists mostly of words that are important to data management and graphing. For the most part, the first time such a 'technical' term is used it is in italics. Because readers have this primer available in PDF format, they can easily search for other instances of index terms (or any terms).[11]

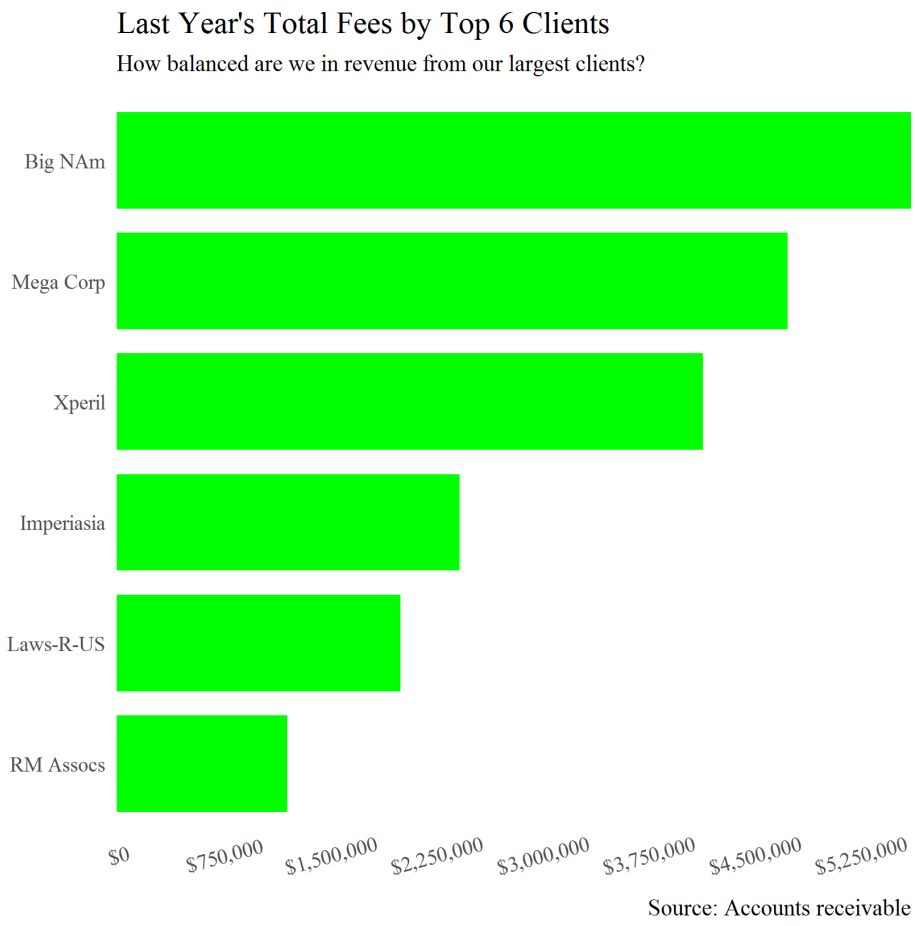
2.5.2 Obiter Dictum: Accurate

Accurate information. Leaders of law firms should assure themselves that the numbers gathered within the firm or from outside the firm accurately capture what they purport to measure. Garbage in leads to trashy graphics. For example, as a precaution, every now and then someone should quiz the person who creates matters in the time and billing system to understand what their criteria are and how consistently they apply them. Look at data over time to check its consistency. Run basic tests to see the distribution of the data. Have someone who knows about the data stress test it for reasonableness and consistency. As another example, confirm that practice group members are properly labeled in a defensible and explainable procedure. As the saying goes, with data "Trust but verify."

[11] With Windows, CTRL-F, brings up a search window.

3 What Data and Plots Can Help Our Business Decisions?

3.1 Clients; Finance: Revenue During the Past Year from Key Clients



The Opening Argument

Concentrate on your key clients, strengthen your ties with them, invest in the relationships, and expand your services. But to do so you need to know who are your key clients and how much they paid you, which a plot like this one displays.

Framing the Decision

Law firm management ought to pay close attention to the firm's clients that steadily generate the largest fee receipts. These primary clients are dependable clients, reference clients, clients who can introduce the firm to new kinds of work, among many positives. They may also have the most leverage over the firm and push the firm to offer lower rates or other concessions.

Sources and Sorcery

The time and billing system of the firm can readily identify the largest-fee clients for a given time period, such as for the past year. However, usually only a few employees have full access to the system and are trained to run reports or otherwise extract data from it. Even just exporting data to a spreadsheet will allow some kind of graphing.

Chart Artistry

One use of a bar chart by a law firm is to present the firm's largest clients, by fees, for the preceding year. Each client is a *factor* , in the terminology of programming and charts, and the total fees they paid the firm is a numeric *value* .

Bar charts are excellent at comparing magnitudes, such as fees paid. This one sorts the total fees and places the highest total on the top bar, the next highest on the second bar down and so on. Some people may prefer to reorder the bars in the reverse order but there seems to be no convention urging one sort or the other. The chart presents only the top six clients, whereas it could have include many more.

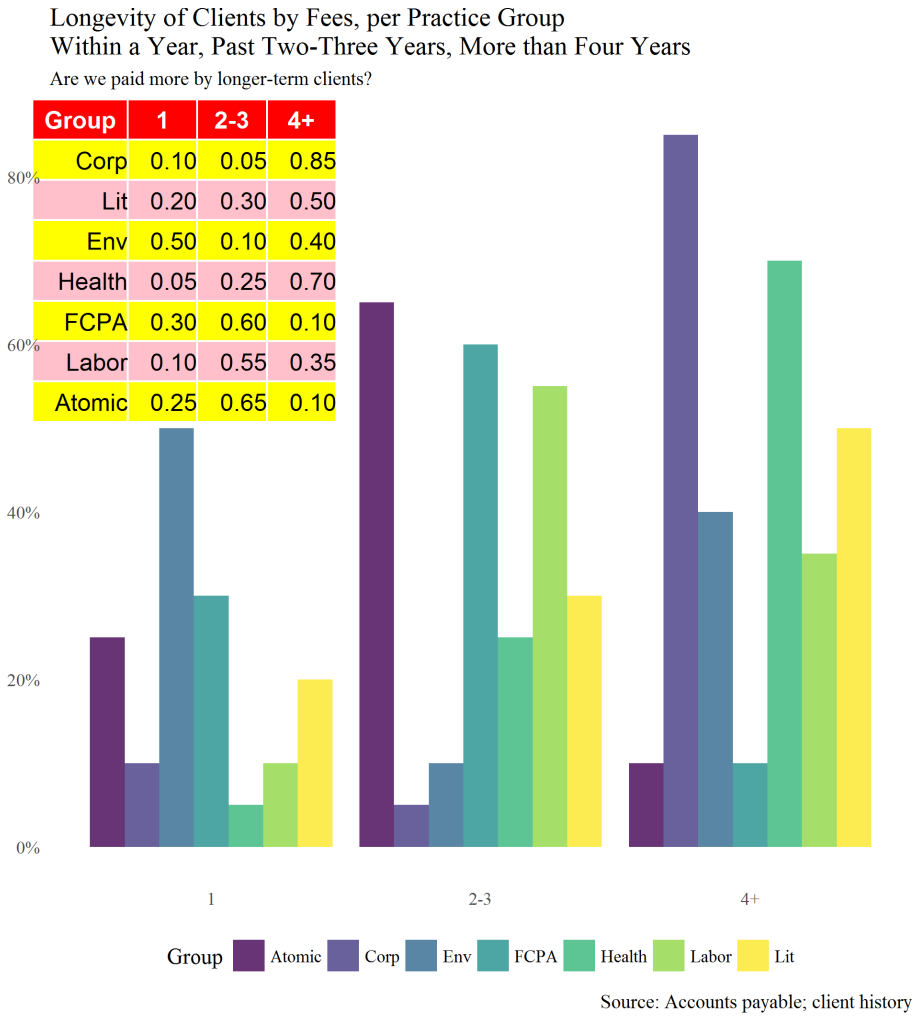
To achieve this presentation, the bar chart swapped the normal factor axis along the bottom, the horizontal x axis, and made it the vertical axis so that the names of clients fit comfortably on the left.

We can read the graph with an example. Mega Corp paid the second highest amount of fees at a bit more then $4.7 million dollars.

Going Plotinum

It may be hard to detect, but the widths of the bars are not as wide as the default. They are 80% of the default, but could be set at any width. This plot could also have light vertical lines so that readers can find the value more precisely from the bottom axis. Or the person who prepared the plot could have put the exact values in the boxes or at the end of the bars. A possible improvement would be to color the bars according to whether the client was publicly traded or not, or had been a client for longer than five years, or had been serviced by more than three practice groups.

3.2 Clients; Marketing: Number of Years the Firm Has Served Key Clients



The Opening Argument

A graph of data that shows which clients have been most loyal to the firm helps leaders decide on marketing, staffing, pricing terms, and more. Even better, if the longevity of clients could be shown by practice groups, as above, the planning can be even more strategic. Best would be if the work done for the client has over time evolved to become more strategic or more profitable[12].

Framing the Decision

All law firms want clients, good clients to be more precise, to become institutional clients, those that year after year bring to the firm significant amounts of work. To the degree that getting work from existing clients costs less than getting work from new clients, and finding good firms is hard for law departments, the longer a firm can serve a client the better it is for both sides. A graph that identifies long-term clients can help a firm's management focus on the care and feeding of them.

[12] A thoughtful comment by Jim Jones as to the last point on moving up the value chain

Source Sorcery

To prepare a chart representing such clients, a firm has to have historical data that follows a similar structure of fields and definitions. Going back three to four years is usually sufficient to identify trends. It also needs to have categorized work by the practice group that handled it.

The Plot Thickens

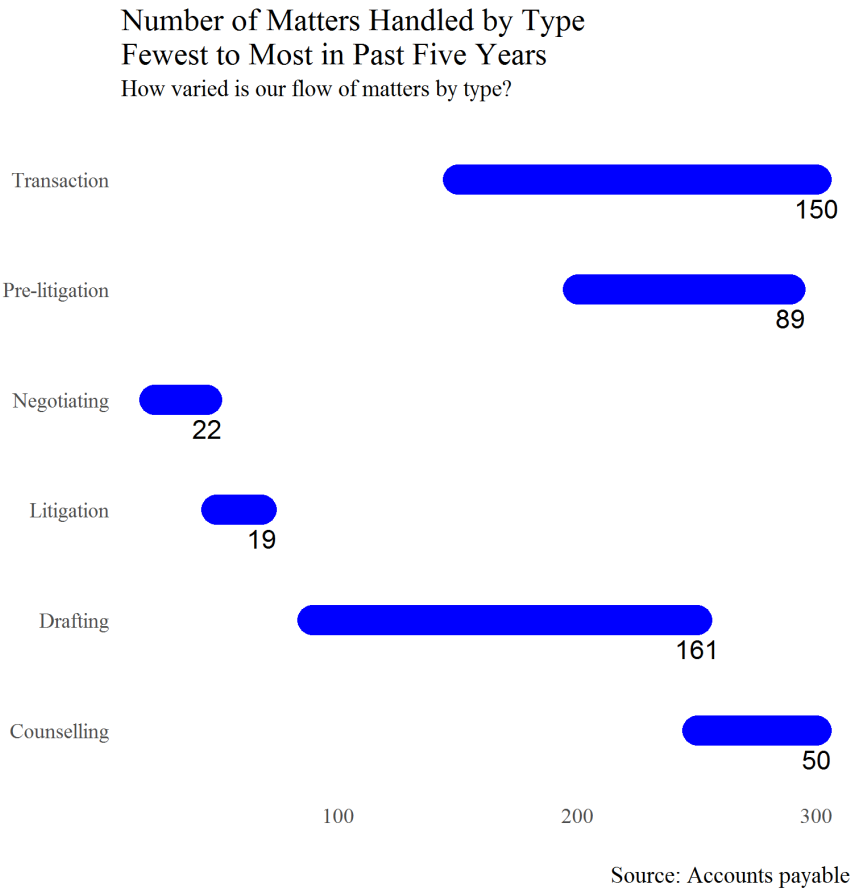
This graph combines a bar chart and a table that displays the precise values. The data for this chart comes from how long the firm has represented major clients. It uses three ranges of longevity: less than 12 months, 13-36 months, and more than three years. This placing data into categories is sometimes referred to as *binifying* numeric data to create a group. One bar for each practice group tells the percentage of fees from clients of those three durations: new, some history, or a long history of representation.

To read this plot, look at the bars for the Litigation Practice Group, which the *legend* at the bottom tells you are the yellow bars on the far right of each year category. Its clients fell into the one year or less bin for 20% of its fees, two to three years for 30%, and the remainder of four or more years as a client at 50%. The total in the three bins equals 100%.

Going Plotinum

An elaboration on this presentation might identify the kind of work done most often for each client. For example, the bars could have segments by type of matter. More could be done with the embedded table in this plot, such as eschewing the garish colors. For example, it might highlight the extreme values. In the real world, a technique of embedding a table in this situation is probably not advisable because it is too confusing. We could also make the legend two lines and might put it in the plot so that the plot takes up more room. A firm that creates this graph would want to create a threshold of fees so that only clients that paid more than that minimum would be accounted for in this chart.

3.3 Matters; Marketing: Number of Matters by Type – Segment Plot



The Opening Argument

As your firm makes decisions about hiring or training, or looks for information to put into a response to a request for a proposal, it would be informative to have a graphic show the numbers of various types of matters your firm has handled.

Framing the Decision

How many matters of different types – however **type of matter** is defined by the firm – a firm can handle competently indicates the breadth and depth of its capabilities on behalf of a client. The matter type may be influenced by what the client uses as a schema for describing or organizing its matters assigned to outside counsel, or it may be a field in a data base that the law firm populates for its own tracking and benefit.[13] Either way, understanding the firm's distribution of matters by matter type can inform decisions on staffing, marketing, knowledge management and indeed on promotions to partner.

[13] One challenge with fields that a law firm tracks over a period of years is that there may be additions or subtractions to the drop-down choices, or redefinition of those choices. Someone needs to standardize the data if the firm wants to have reliable trend results.

Source Sorcery

Firms can extract the kinds of data shown in this plot from their time and billing system. If the information is missing for some, the firm will need to decide who would know and how to organized collecting that retroactive information.

The Plot Thickens

What was the least amount of litigation matters we handled in a year during the past five years? What was the most? A segment plot gives the answer readily. The left end of the segment starts at the lowest number in the period. For Drafting it was 89 matters. The segment ends on the right at the highest number in the period, 250 for Drafting. The number at the end of the segment tells the total number. Thus, at a glance the reader can compare ranges and aggregated values for all six matter types.

We left the default ordering of the matter types on the left axis, alphabetical from the bottom, but we could have arrayed them by the largest number or by the largest range or some other distinction.

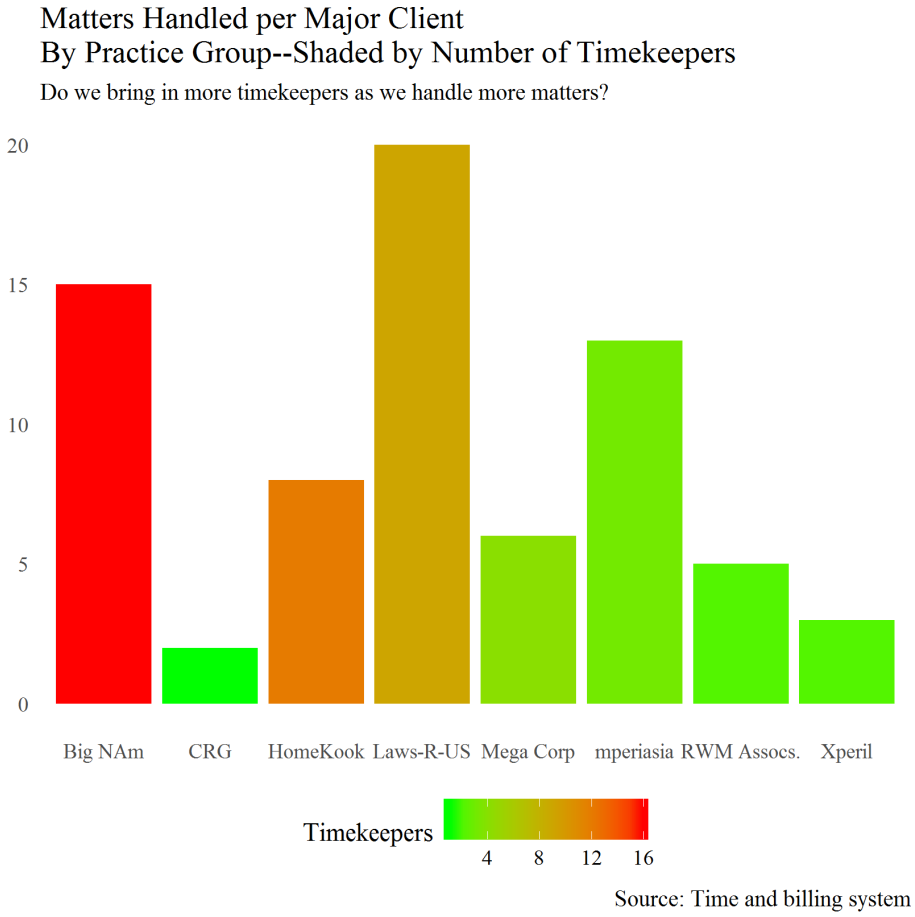
Going Plotinum

Some readers would prefer that the segment labels be centered in the segments, or that the segments not be so thick, or colored less brightly, or have square ends. Such is the life of someone who prepares data graphics: "You can please some of the people some of the time...."

3.3.1 Obiter Dictum: Chronological consistency

Chronological consistency. Assume from 2010 to 2015 matters were opened whenever at least 10 hours of work was expected, instead of throwing the time into the catch-all general matter. Then in 2016 the threshold was reduced to five hours. That shift in definition confounds plots based on the number of matters during the two time periods. Both of those decisions, moreover, call for someone to make the decision. People who don't want to endure the hassle of opening a matter will end up with fewer of them; people who think large numbers of matters make them look better will open more of them. More generally, data collected over time needs to be defined and collected consistently. For that matter, even data within the time period needs to be coded consistently.

3.4 Clients; Matters: Number of Matters Handled and Number of Timekeepers



The Opening Argument

To decide how to increase your services to key clients you might like to know how many matters your firm has handled. Better yet, have a graph illustrate that data but also break it down by your practice groups. As long as you compile that, why not make your decisions also knowing how many timekeepers worked for the client?

Framing the Decision

Two measures that partners in law firms attend to are how many different matters have we worked on for key clients and how many timekeepers have billed to those matters? Together, those metrics point to what might be called **embeddeness**, the breadth and depth of work and workers on behalf of a client. Another indicator of embeddedness would be how long the client has retained the firm to do material amounts of work.

Source Sorcery

As with other trend analyses, a law firm must have some historical data available to it, and the data needs to be consistent during the period for the fields that matter. For example, if there are a limited number of choices of levels of lawyers (Sr. Partner, Associate, etc.), the data needs

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