uFlexi business spec.

441 Graphic analytics

Version Control					
Version	1.2	Release Date	Nov. 2018	Authorized by	Wingham Rowan/TB

CONTEXT

This module takes rows returned by a search in uFlexi and distils the data into standardized, interactive, graphic snapshots. Outputs vary with the entity being searched on a given screen.

Our markets generate enormous amounts of data. It can be used to inform personal progression, support interventions, shape business opportunities, inform local policymaking and demonstrate an unlaunched market will be viable. Later it can be blended with other sources to create indices, track trends like skills shortages as they emerge and enable comparisons across sectors/geographies/seller tags. Our users can already derive this information but it involves export and manipulation. We want to make it one-click appealing.

A typical usecase for these features is; user has defined a set of rows of interest and now wants to really understand what the data is telling him. For example:

- *I have found 137 bookings of call center agents where the worker was <25 and previously long-term unemployed. I want to understand how these bookings compare in earnings, location and times of the week to market-research bookings. If earnings are higher but locations and times align I can justify upskilling call centre people to interviewing.*
- *I want to see how far workers are travelling, and when, to bookings that pay >$15 an hour. We may be justified in chartering transport to help people reach these bookings.*
- *It would cost me $200 to add carpet-laying to my checks just as I am planning to move to the other side of the city. I want to understand how much more I could earn in that new travel area if I become qualified to do these bookings.*

This ticket covers the basics of an Analytics suite. It builds on overhauls of our Reporting screens (ticket 422) and Search functionality (ticket 439). But it is dependant on neither. This module:

- Creates a Summary Table of data in a set of returns
- Offers a link which, when clicked, expands into a five-section graphic display.

Search fields used to produce the returns and the display of those returns can evolve independently of this section of our screens. Substantial work is on-going on our search and returns screens in parallel with this ticket. That may require evolution of on-screen ordering or other issues. We hope to get additional web design input in the near future and may have access to off-the-shelf tools not currently explored. Because of all this, we need to see this ticket as a direction of travel rather than verbatim instructions.

Crucially, this module makes use of derived data. For example, when a set of checks (vettings) are defined we can bring back all the bookings that required at least one of those checks. Modelling the booking data then tells us how valuable those checks have been to sellers, buyers and agencies. Ticket 422 involved creating this computed data for several screens. That work is pending new resources. Those columns should be finished before this ticket starts.

Contents

1) Overview of Graphic Analytics

a) Placement and components

Currently, uFlexi's search/reporting pages have two parts:

- **Inputs**: fields the user can populate before clicking the button to trigger a search.
- **Outputs**: the rows of returned data that then sit below the button.

This ticket creates a new section above the returned rows. It comprises two components:

1. **Summary table**: Each page has a table. It is a series of summaries, totals and sub-sets. Every time rows are recalculated, the Summary table refreshes. It is always on display and needs to be visually dominant, with chunky outputs more eye catching that the fine-grained detail in rows.
2. **Analytics expander**: This is hidden behind a link. When clicked it opens five sections of graphics extrapolated from the rows below. Sections are:
    - **Timeline**: an area chart reflecting trends in the data in the specified time. For example in a screen delivering rows about bookings within a three month date range it would show the number of hours per week in the data. The chart can combine related outputs and be set to display different parameters.
    - **Location**: a heatmap of locations in the data.
    - **Days/times**: this shows a heatmap of times of day in the data, for example in a list of 50 bookings how many hours were worked on a Monday between 13.00-14.00? The logical way to display this is using our AAG grid, color coded by the proportion of hours in each cell.
    - **Parameters**: secondary data from the returns in a mix of line charts, pie charts and possibly histograms.
    - **Averages**: a series of tablets each offering mean data from one column in the rows below.

b) Screen mock-up

This mock-up relates to a page about bookings such as agencyBookingsReportCriteria. Once the search criteria are input and the button is clicked, user will see the rows as now. But above them will be this Summary table:

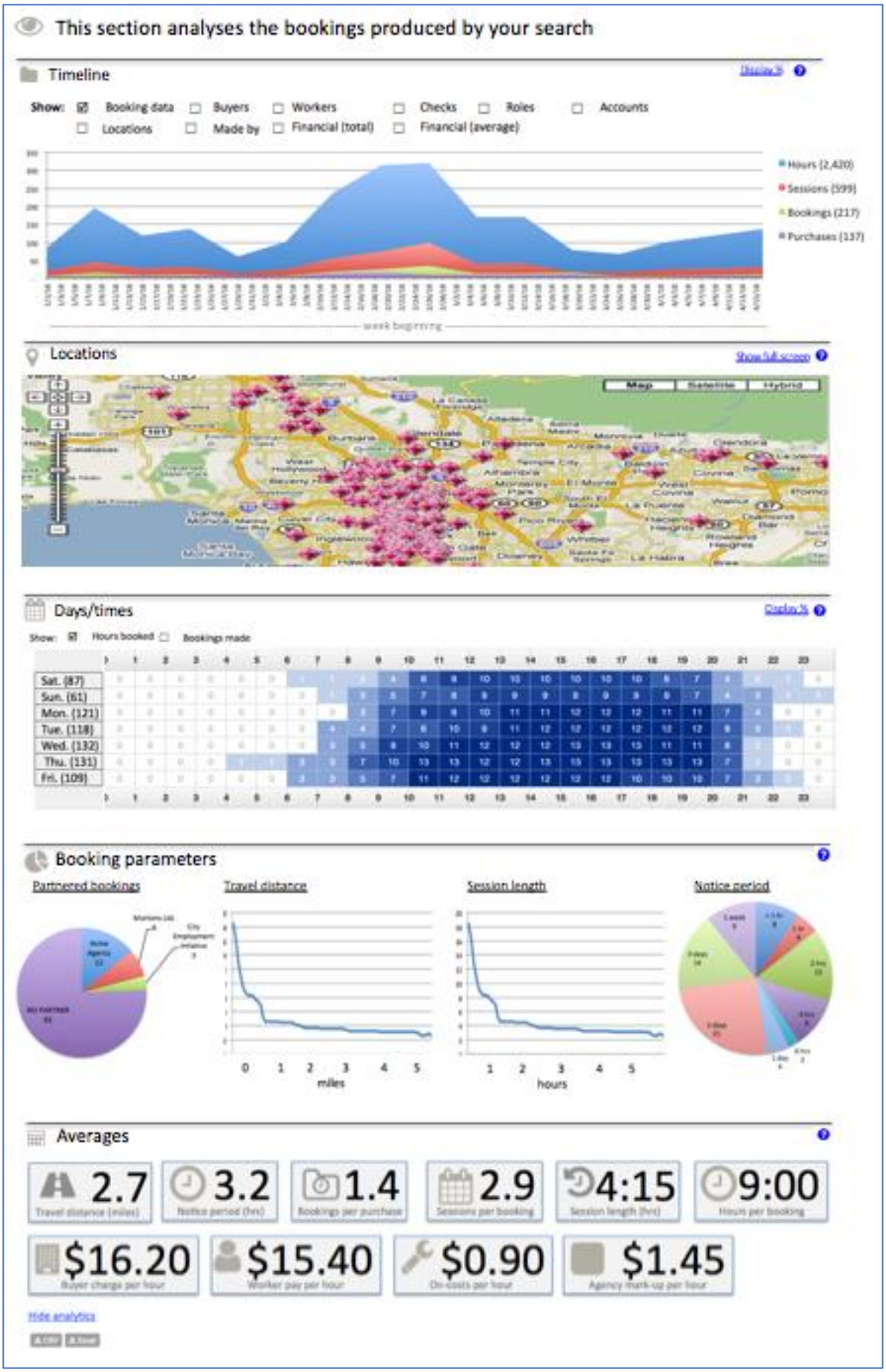
Data summary Show decimals

Activity			Parties			Details		Totals				
Bookings	Sessions	Hours	Agencies	Buyers	Sellers	Roles	Locations	Buyer charge	Worker pay	On-costs	Agency mark-up	System charge
210	338	1,456	12	47	172	65	96	$25,481	$21,382	$1,435	$2,400	$952

Show analytics

CSV Excel

When the "Show analytics" link is clicked, the gap above the rows expands to this:


This section analyses the bookings produced by your search
Timeline
Show: Booking data Buyers Workers Checks Roles Accounts
Locations Made by Financial (total) Financial (average)
Hours (2,420)
Sessions (599)
Bookings (217)
Purchases (137)
week beginning
Locations
Map Satellite Hybrid
Days/times
Show: Hours booked Bookings made
Sat. (87)
Sun. (61)
Mon. (121)
Tue. (118)
Wed. (132)
Thu. (131)
Fri. (109)
Booking parameters
Partnered bookings
Travel distance
miles
Session length
hours
Notice period
Averages
2.7
Travel distance (miles)
3.2
Notice period (hrs)
1.4
Bookings per purchase
2.9
Sessions per booking
4:15
Session length (hrs)
9:00
Hours per booking
$16.20
Buyer charge per hour
$15.40
Worker pay per hour
$0.90
On-costs per hour
$1.45
Agency mark-up per hour
Hide analytics

c) Business rules

- Nothing in this ticket changes any rules about what level of user can see what data. If a user is not entitled to see a particular column in a set of returns, it is not distilled in their Analytics section (eg a Buyer can not see Seller pay data in a booking report so they do not see an average or any other display of that data).
- This ticket does not grant new permissions to view data through links such as those in Summary tables. If a user is not already entitled to view a page of data we do not offer a link to it.
- Bookings data is of vital interest in any distillation of returns. It is not only obvious pages about purchases/bookings/timesheets that have bookings data to summarize. Other entities carry derived data about bookings. For example:
    - **Agency/Buyer/Seller**: bookings by the entities returned in a search (by their buyers or sellers in the case of agency).
    - **Accounts**: bookings under those accounts (as shown on the Account audit screen for for example).
    - **Checks/Roles**: bookings involving the checks/roles in the returns.
    - **Bases/locations**: bookings involving buyers/sellers attached to that base, bookings to work at the locations returned.
    - **Users**: bookings by those users or the buyers/sellers they oversee.

- The Summary table appears automatically on every screen. Graphic material is hidden behind an Analytics link. Every time the screen is refreshed the link closes. This means uFlexi doesn't need to compute the data required for graphic display until the link is clicked.
- Every time search inputs are changed or results are filtered the Summary table is refreshed and the Analytics section has to be reopened.
- The Show analytics link appears as long as >0 rows are returned. Even if only one row is returned, the Summary table offers easy links and there is still value in seeing data mapped or shown on an AAG. Averages will all replicate data in that one row but we should retain this section for consistency.

- All data displayed in a Summary table or Analytics section must directly and exclusively map onto the data in rows below. In other words: anyone geeky enough to download the rows and total or average them in a spreadsheet would get to exactly the same figures as our display. (We may need to include wording about rounding issues to arrive at this state.)
- Back Office has access to this module. Unusually for BO, display needs to be as good as elsewhere in the system: we will be showing the outputs to important people.

2) Scope of this project

This project will be complete when the relevant Summary table and Analytics section is available on every full-reporting and sub-reporting screen. The list of those screens follows:

TABLE: Screens in scope of this project				
Access to screen	Screen heading	Screen URL	**Entity being searched**	NOTES
Agency superuser > Reports menu	Bookings	agencyBookingsReportCriteria	**Bookings**	
	Timesheet	agencyTimesheetReportCriteria	**Timesheets**	
	Invoice Exp.	agencyJobInvoiceReportCriteria	**Timesheets**	This page is an anomaly, designed for easy transfer to a payroll system. Columns should not be changed in any way. But we apply this project to the screen.
	Staff	agencyStaffReportCriteria	**Users**	
	Partners	agencyPartnershipSummaryReportCriteria	**Agencies**	
	Partnered Bks	agencyPartneredPurchaseReportCriteria	**Bookings**	
	Buyers Gen.	agencyBuyerReportCriteria	**Buyers**	
	Staff	agencyBuyerStaffReportCriteria	**Users**	
	Accounts	agencyBuyerCostCentreReportCriteria	**Accounts**	
	Account Audit	agencyBuyerCostCentreAuditReportCriteria	**Purchases**	
	Locations	agencyBuyerLocationReportCriteria.	**Locations**	
	Sellers Gen.	agencySellerReportCriteria	**Sellers**	
	Market levels	agencySellerGradingReportCriteria	**Sellers**	
	Timesheet Coms.	agencyTimesheetBuyerCommentsReportCriteria	**Timesheets**	
Agency, off Locations list	[NAME OF AGENCY] staff at [NAME OF BASE]	agencyBranchStaff	**Users**	
Buyer superuser > Reports menu	Timesheets	buyerTimesheetReportCriteria	**Timesheets**	
	Users (may have different display term)	buyerBuyerStaffReportCriteria	**Users**	
	Accounts	buyerCostCentreReportCriteria	**Accounts**	
	Accounts Audit	buyerCostCentreAuditReportCriteria	**Accounts**	
	[NAME] ratings	buyerBuyerStarRatingReportCriteria	**Sellers**	

	Timesheet comments (optional)	buyerTimesheetBuyerCommentsReportCriteria	**Timesheets**	
Agency home page accordion	Bookings	agencyRecentPurchases	**Purchases/Bookings**	Top table displays purchases. Bottom table displays bookings. Each set of rows needs its own analytics section
	Timesheets	agencyInvoicingSearchTimesheets	**Timesheets**	
	Buyers	agencyFindBuyer	**Buyers**	
	Sellers	agencyFindSeller	**Sellers**	
Agency manage menus	Buyer's roles	agencyBuyerPurchaseContractsManage	**Roles**	
	Buyer's accounts	agencyCostCentres	**Accounts**	
	Buyer's locations	agencyBuyerLocations	**Locations**	
	Seller's checks	agencySellerVettings	**Checks in relation to Seller**	
	Seller's roles	agencyPurchaseContractLevelsManage	**Roles in relation to Seller**	
Buyer home page accordion	Bookings	buyerPastPurchaseSearch	**Purchases**	
	Timesheets awaiting approval	buyerInvoicingHome	**Timesheets**	To discuss: We are looking at setting up equivalent of agencyInvoicingSearchTimesheets (a sub report timesheet screen for Buyer). To be discussed with KM. That would be in scope for this project.
Seller home page accordion	My Bookings	sellerJobHistoryView	**Bookings**	
	Timesheets	sellerInvoicingHome	**Timesheets**	
Agency > Settings menu	Branches (may have different display term)	agencyBranches	**Locations**	
	Staff	agencyStaffManagement	**Users**	
	Checks	agencyVettingsManage	**Checks**	
	Worker tags	agencyTickboxesDisplay		(Ignore this screen, it is to be removed shortly.)
	Roles	agencyPurchaseContractLevelsManage	**Roles**	
	Working Time Restrictions	agencyWorkingTimeRestrictionManage	**UNIQUE**	Outside project scope
	Future Requirements	agencyRepeatPurchases	**Purchases**	
Buyer > Settings Menu	Locations	buyerLocations	**Locations**	
	Reporting Instructions	buyerReportingProfilesManage	**UNIQUE**	Outside project scope
	Users (may have different display term)	buyerStaffManagement	**Users**	

	[NAME] Ratings	buyerStarRatingCostCentre	**UNIQUE**	(ignore this screen. It is to be reworked with new functionality.)
	Accounts	buyerCostCentres	**Accounts**	
	Documents	buyerDocuments	**UNIQUE**	(Ignore this screen. It is to be killed off.)
Buyer misc.	Repeat Bookings list	buyerRepeatPurchaseConfirm	**Bookings**	
Seller > Settings Menu	My Roles	sellerBuyersRoles	**Roles applied to Seller**	
	My Checks	sellerVettings	**Checks applied to Seller**	
	My Buyers (may have display term)	sellerBuyers	**Buyers**	
	My Bookings	sellerJobHistoryView	**Bookings by Seller**	
	Documents	sellerDocuments	**UNIQUE**	(Ignore this page. It is to be killed off.)
Seller > Misc	Booking History (with a Buyer)	sellerBuyerDetails	**Bookings**	
	Recurring booking	sellerRepeatPurchaseDetails	**Bookings**	
Directories	Agencies	directoryAgencyViewInit		Outside project scope
	Buyers	directoryBuyerViewInit		
	Sellers	directorySellerViewInit		
Agency home accordions	Bookings			
	Timesheets			
	Buyers			
	Workers			
Buyer home accordions	Bookings			
	Timesheets			
	Accounts			
Seller home accordions	My Bookings			
	My Timesheets			

3) COMPONENT ONE: The Summary table

a) Makeup and precedents

The table comprises a single row of outputs under a series of column headers each with an icon. Columns may be grouped under column spanning clusters. There is a top row which contextualizes the table. Summary tables load without decimal places, they are intended as a quickly absorbed snapshot of all the data identified, with minimal clutter.

We already have a broad convention for this element. It appears on:

Seller: My Bookings (sellerJobHistoryView):

Booked Hours Overview: Wingham Rowan

	Bookings:											
Buyers	Total	Waiting	Confirmed	Live	Over	No response	Worker cancelled	Buyer cancelled	Agency cancelled	Hours booked	Total Pay	Average hourly pay
15	372	0	18	0	304	26	6	2	11	704	£7,450.19	£10.58

Buyer: confirmation of a recurring booking (buyerRepeatPurchaseConfirm):

Recurring Booking: overview

SESSIONS	NO. WORKERS	STARTED	ENDS	WEEKS SO FAR	HOURS BOOKED	TOTAL COST	AV. HOURLY COST
Sat. 15:00 - 17:30	1	Sat. 08 Apr 2017	Sat. 30 Dec 2017	22	55.0 hrs	£643.72	£257.49

- This project will introduce some amended conventions for Summary tables to ensure consistency across a portfolio of pages. These changes need to be applied to the two tables above as part of the project.

b) Table elements

Each Summary table comprises:

- **A top row**: this should not be too descriptive because the data summarized changes every time a search parameter or filter is reset. Unless otherwise specified, the heading is “Data summary”. This has a darker gray background.
    - The top row includes a far right link: “Show decimals”. This inserts the decimals to all columns that have a monetary value. This may involve adjusting the overall figure downward if it has been rounded up. (eg: $432 becomes $431.51.)
- **First column**: this always returns the number of rows in the data below. This is the immediate datapoint of interest so the column is not clustered (see below) but has a double height column heading to make it stand out.

- **Potential column clusters**: this can be seen in the "Bookings" column span on the top table above. But it would be unnecessary clutter in the second table. This row has the same darker gray background as above.
- **Column headings**: these have an icon in dark gray but are on a light gray background.
- **Output cells**: large, black bold numbers on a white background. This can include a currency symbol or % symbol where appropriate.

Below the table is our link "Show analytics". When the expander is opened this toggles to "Hide analytics".

Export: User may want to carry summary data into a spreadsheet, for example to compare 10 datasets side-by-side. *("I want to see how number of locations has evolved over the last year for book-keepers.")* We facilitate this with our standard export buttons below the link that opens the Analytics expander. Exporting always outputs column headings in one column and numbers in the second column.

- Numbers are exported with decimals regardless of whether decimals were showing on the table at the time.

c) Links in the table

Where possible the output cell offers a link to a page of rows that form the foundation of that number. For example, in the My Bookings summary above, the"18" returns the page loaded purely with the 18 bookings that have CONFIRMED status.

There are two categories of links:

- Sub-sets: the "18" example above illustrates this; the figure relates to some part of the rows below, clicking the numeral returns the screen with just those rows. For navigation back to the overall page the Total digits have to become links when a sub-set is being viewed.
    - Any cell outputting a percentage is a sub-set link. Clicking it reloads the screen with just the rows that make up that percentage. For example: the summary table for a list of roles might specify that 27% of the 200 returns are roles created at agency level. Clicking the 27% returns the 54 rows in question.
- Other entities: a page of bookings data will feature a summary of the number of roles in the data below. Assume there are 8 roles in total in a set of 17 bookings. Clicking the "8" needs to bring up full details of those roles. This is done by linking to the reporting screen for roles (agencyPurchaseContractLevelsManage) as it would appear if those 8 roles had been entered as search inputs. Return to the original page can be through the browser Back button. But ideally we would feature a Back button on our screen about the other entities.

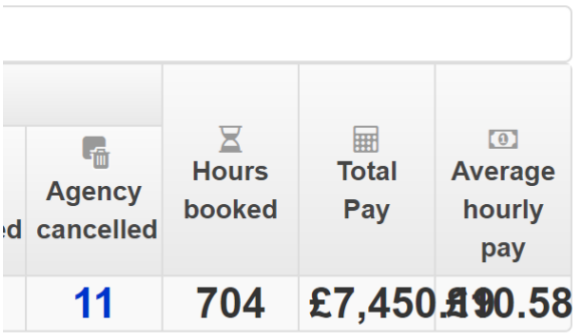
d) Design issues

We need consistency across our Summary tables, including the two already in existence. Points include:

- Capitalization in column headers. The Recurring Booking Summary table has all-capitalized headers. The My Bookings table does not. We need to standardize.

  Preference is for title case headers: first letter of the heading only is a capital.

- Resizing: As screen-width narrows the table should split into two rows or re-size. Currently, right-hand columns can sometimes disappear behind the margin or output cells can be crushed:

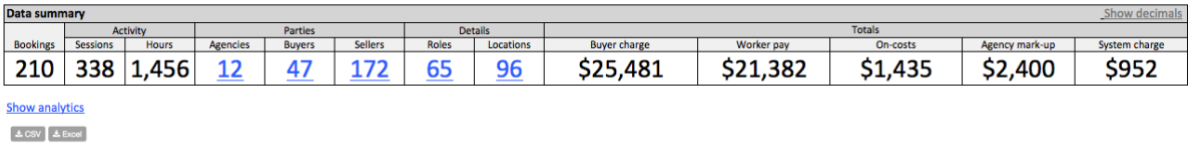
  We need to ensure tables fit whatever screen is being used.

  Some points for clarity:

  - Visible columns: user only sees a Summary table column for a column they can see in the rows below. That means lower level users don't necessarily see every column listed for a Summary table for any given entity. The Data hierarchy document (ticket 422) lists who can see what on a screen relating to any given entity.
  - Agencies column: there is a potential conflict of compliance with the agencies output in our Summary table for bookings. Normally, Buyer and Seller would not be permitted to see data about agencies. But when bookings involve a partner agency that is revealed to Buyer and Seller through the timesheet. We therefore can show this column to them. If that column appears in the rows below the total of unique agencies can be displayed in the summary box to all users.
  - Date ranges: search inputs can define a date range (eg *"Show only Buyers who made a booking in the last month").* In these cases, returned rows may display non-date-specific data, for example on the number of roles created by that agency. That is the figure we total for the Summary table, not roles created within the date range. The golden rule is: the Summary table must totalise – or turn into a percentage – exactly what is in the return rows below.

e) Mock-ups

Summary table for a screen about bookings (for example on agencyBookingsReport):



Data summary												Show decimals
	Activity			Parties			Details		Totals				
Bookings	Sessions	Hours	Agencies	Buyers	Sellers	Roles	Locations	Buyer charge	Worker pay	On-costs	Agency mark-up	System charge
210	338	1,456	12	47	172	65	96	$25,481	$21,382	$1,435	$2,400	$952

Show analytics

CSV Excel

Summary table for purchases data (as required on buyerPastPurchaseSearch for instance) on a narrow screen:

Data summary						Show decimals
	Activity			Parties		
Purchases	Bookings	Sessions	Hours	Agencies	Buyers	Sellers
143	210	338	1,456	12	47	172
Details		Totals				
Roles	Locations	Buyer charge	Worker pay	On-costs	Agency mark-up	System charge
65	96	$25,481	$21,382	$1,435	$2,400	$952

Show analytics

CSV Excel

- Potentially redundant functionality

  This functionality replicates and replaces the “auto-populate” facility described in ticket 439 section 5(c). If that functionality exists at the point this ticket is actioned, it should be removed from screens once the links become available in Summary tables. The previous ticket should be consulted if there is any doubt about what figures in a Summary table should link to other reporting screens.

4) Summary table contents

Columns in a Summary Table are determined by our Data Hierarchy applied to the entity being searched on the page where the table sits.

Specific columns are shown overleaf:

(Note: colouring of column spans in the grid below is purely to make this document easier to absorb for developers, it doesn't translate into any screen design.)

Icons list

We have a separate document listing the appropriate icons for any entity to be displayed in elements like a Summary table.

TABLE: Columns in Summary Tables according to Entity being Searched

			Columns														
	Entity being searched	Section of summary table	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	**Agencies**	Top row															
		Column spans	N/A	Parties			Activity					Totals					
		Columns	Agencies	Partnerships	[BUYER]s	[SELLER]s	Roles	Purchases	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	
		Outputs	No. of rows below	Total number of partnerships the combined agencies have (both types of partnering)	No. of Buyers with Approved status owned by these agencies combined	No. of Sellers with Approved status owned by these agencies combined	Total no. of roles owned by entities in the roles below (at agency or buyer level)	Total no. of purchases by entities in the rows below	Total no. of bookings by entities in the rows below	No. of sessions ion the bookings in the previous column	No. of hours in the bookings in the last column but one	Total charges to buyers by entities in the rows below	Total pay to sellers by entities in the rows below	Total on-costs charged by entities in the rows below	Total proportional mark-up charged by entities in the rows below	Total fixed ph mark-up charged by entities in the rows below	
2.	**Buyers**	Top row															
		Column spans	N/A	Parties		Activity							Totals				
		Columns	[BUYER]s	Agencies	[SELLER]s	Roles	Locations	Users	Purchases	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up	
		Outputs	No. of rows below	How many unique agencies were involved in bookings by entities in this list in the given	How many unique sellers were involved in bookings by entities in this list in the given	Total no. of roles attached to buyers returned in the rows below	How many locations do the entities in rows below have combined?	How many users with a approved status do the entities in rows below have combined?	Total no. of purchases by entities in the rows below	Total no. of bookings by entities in the rows below	No. of sessions ion the bookings in the previous column	No. of hours in the bookings in the last column but one	Total charges to entities in the rows below	Total pay to sellers from entities in the rows below	Total on-costs charged to entities in the rows below	Total (proportional + fixed) mark-up charged by entities in the rows below	

				date range[1]	date range												
3.	**Sellers**	Top row															
		Column spans	N/A	Parties		Activity					Totals						
		Columns	[SELLER]s	Agencies	[BUYER]s	Checks	Roles	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up			
		Outputs	No. of rows below	How many unique agencies own the sellers in rows below?	How many unique buyers have booked the sellers in rows below?	What is the total number of unique checks held by sellers below	What is the total number of unique roles held by sellers below	Total no. of bookings of entities in the rows below	No. of sessions in the bookings in the previous column	No. of hours in the bookings in the last column but one	Total charges for bookings in the bookings column in this table	Total pay from bookings in the bookings column in this table	Total charges for on-costs in the bookings column in this table	Total (proportional + fixed) mark-for bookings in the bookings column in this table			
4.	**Bookings by Seller**	This table already exists: it is displayed on sellerJobHistoryView															
5.	**Checks**	Top row															
		Column spans	N/A	Type			Source			Activity				Totals			
		Columns	Checks	Credentials	Tags	Preferences	Standard	Agency	[BUYER]	[SELLER]s requested	SELLER]s active	SELLER]s withdrawn	Roles enabled	Bookings enabled	Value		
		Outputs	Total checks returned in the rows below	%. of checks of this type in the rows below	%. of checks of this type in the rows below	%. of checks of this type in the rows below	%. of checks originated at this level in the rows below	%. of checks originated at this level in the rows below	%. of checks originated at this level in the rows below	Total of all (non-unique) sellers with a check in the rows below at this status	Total of all (non-unique) sellers with a check in the rows below at this status	Total of all (non-unique) sellers with a check in the rows below at this status	No. of unique roles enabled by the checks below	No. of bookings involving by the roles in the previous column	Total charge to buyers from bookings in the previous column		
6.	**Checks applied to Seller**	Top row															
		Column spans	N/A	Parties		Activity				Totals							
		Columns	[SELLER]s	Agencies	[BUYER]s	Roles	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up				

[1] Includes agencies involved in a booking through re-sell or supply partnering.

		Outputs	No. of rows below	How many unique agencies own the sellers in rows below?	How many unique buyers have booked the sellers in rows below?	What is the total number of unique roles held by sellers below	Total no. of bookings of entities in the rows below	No. of sessions in the bookings in the previous column	No. of hours in the bookings in the last column but one	Total charges for bookings in the bookings column in this table	Total pay from bookings in the bookings column in this table	Total charges for on-costs in the bookings column in this table	Total (proportional + fixed) mark-for bookings in the bookings column in this table				
7.	**Roles**	Top row															
		Column spans	N/A	Source			Activity				Totals						
		Columns	Roles	Standard	Agency	[BUYER]	[SELLER]s offered	SELLER]s active	SELLER]s withdrawn	Roles enabled	Bookings enabled	Value					
		Outputs	Total roles returned in the rows below	%. of checks originated at this level in the rows below	%. of checks originated at this level in the rows below	%. of checks originated at this level in the rows below	Total of all (non-unique) sellers with a check in the rows below at this status	Total of all (non-unique) sellers with a check in the rows below at this status	Total of all (non-unique) sellers with a check in the rows below at this status	No. of unique roles enabled by the checks below	No. of bookings involving by the roles in the previous column	Total charge to buyers from bookings in the previous column					
8.	**Roles applied to Seller**	Top row															
		Column spans	N/A	Parties		Activity				Totals							
		Columns	[SELLER]s	Agencies	[BUYER]s	Checks	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up				
		Outputs	No. of rows below	How many unique agencies own the sellers in rows below?	How many unique buyers have booked the sellers in rows below?	What is the total number of unique checks held by sellers below	Total no. of bookings of entities in the rows below	No. of sessions in the bookings in the previous column	No. of hours in the bookings in the last column but one	Total charges for bookings in the bookings column in this table	Total pay from bookings in the bookings column in this table	Total charges for on-costs in the bookings column in this table	Total (proportional + fixed) mark-for bookings in the bookings column				

													in this table				
9.	**Accounts**	Top row															
		Column spans	N/A	Parties			Activity					Totals					
		Columns	Accounts	Agencies	Buyers	Sellers	Roles	Locations	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge
		Outputs	Total number of accounts returned by this search	Total number of unique agencies involved in the data below[2]	Total number of unique buyers in the data below[3]	Total number of unique sellers in the data below	Total number of unique roles in the data below	Total number of unique locations in the data below	Total number of bookings in the data below	Total number of sessions in the data below	Total number of hours in the data below	Total of the "charge" column in the rows below[4]	Total of the "pay" column in the rows below[5]	Total of the "on-costs" column in the rows below[6]	Total of the "proportional mark-up" column in the rows below[7]	Total of the "fixed mark-up" column in the rows below[8]	Total of the "system charge" column in the rows below[9]
10.	**Purchases**	Top row															
		Column spans	N/A	Parties			Activity					Totals					
		Columns	Purchases	Agencies	Buyers	Sellers	Roles	Locations	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge
		Outputs	Total number of purchases in the data below	Total number of unique agencies involved in the	Total number of unique buyers in the data below[11]	Total number of unique sellers in the data below	Total number of unique roles in the data below	Total number of unique locations in the data below	Total number of bookings in the data below	Total number of sessions in the data below	Total number of hours in the data below	Total of the "charge" column in the rows below[12]	Total of the "pay" column in the rows below[13]	Total of the "on-costs" column in the rows below[14]	Total of the "proportional mark-up" column in the	Total of the "fixed mark-up" column in the	Total of the "system charge" column in the

[2] Agencies can be supply or partnering, the agency owning the viewing entity is included. (In other words: a buyer belonging to an agency with no partners would only ever see a "1" in this output.)
[3] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[4] Not shown to seller: they don't see that column.
[5] Not shown to buyer: they don't see that column.
[6] Not shown to buyer or seller: they don't see that column.
[7] Ditto
[8] Ditto
[9] Only shown to BO users
[11] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[12] Not shown to seller: they don't see that column.
[13] Not shown to buyer: they don't see that column.
[14] Not shown to buyer or seller: they don't see that column.

				data below[10]											rows below[15]	rows below[16]	rows below[17]
11.	**Bookings**	Top row	Data overview: Bookings														
		Column spans	N/A	Parties			Activity				Totals						
		Columns	Bookings	Agencies	Buyers	Sellers	Roles	Locations	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge	
		Outputs	Total number of bookings in the data below	Total number of unique agencies involved in the data below[18]	Total number of unique buyers in the data below[19]	Total number of unique sellers in the data below	Total number of unique roles in the data below	Total number of unique locations in the data below	Total number of sessions in the data below	Total number of hours in the data below	Total of the "charge" column in the rows below[20]	Total of the "pay" column in the rows below[21]	Total of the "on-costs" column in the rows below[22]	Total of the "proportional mark-up" column in the rows below[23]	Total of the "fixed mark-up" column in the rows below[24]	Total of the "system charge" column in the rows below[25]	
12.	**Timesheets**	Top row															
		Column spans	N/A	Status			Parties			Activity		Totals					
		Columns	Timesheets	Not completed (%)	Processed (%)	Overdue (%)	Agencies	Buyers	Sellers	Bookings	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge
		Outputs		% of timesheets in the	% of timesheets in the	% of timesheets in the	Total number of unique	Total number of unique	Total number of unique	Total number of booking	Total number of hours in	Total of the "charge"	Total of the "pay" column	Total of the "on-costs" column	Total of the "proportional	Total of the "fixed mark-	Total of the "system charge"

[10] Agencies can be supply or partnering, the agency owning the viewing entity is included. (In other words: a buyer belonging to an agency with no partners would only ever see a "1" in this output.)
[15] Ditto
[16] Ditto
[17] Only shown to BO users
[18] Agencies can be supply or partnering, the agency owning the viewing entity is included. (In other words: a buyer belonging to an agency with no partners would only ever see a "1" in this output.)
[19] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[20] Not shown to seller: they don't see that column.
[21] Not shown to buyer: they don't see that column.
[22] Not shown to buyer or seller: they don't see that column.
[23] Ditto
[24] Ditto
[25] Only shown to BO users

				rows below with this status	rows below with this status	rows below with this status	agencies involved in the data below[26]	buyers in the data below[27]	sellers in the data below	s in the data below	the data below	column in the rows below[28]	in the rows below[29]	in the rows below[30]	mark-up" column in the rows below[31]	up" column in the rows below[32]	column in the rows below[33]
13.	**Bases/ Locations**	Top row															
		Column spans	N/A	Parties			Activity					Totals					
		Columns	Bases/Locations	Agencies	Buyers	Sellers	Users	Purchases	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge
		Outputs		Total number of unique agencies involved in the data below[34]	Total number of unique buyers in the data below[35]	Total number of unique sellers who have carried out the bookings in bookings column in this table	Total number of users or staff at the combined locations in the rows below	Total no. of purchases by entities in the rows below	Total no. of bookings where the place of work is in the rows below	Total number of sessions in the data below	Total number of hours in the data below	Total of the "charge" column in the rows below[36]	Total of the "pay" column in the rows below[37]	Total of the "on-costs" column in the rows below[38]	Total of the "proportional mark-up" column in the rows below[39]	Total of the "fixed mark-up" column in the rows below[40]	Total of the "system charge" column in the rows below[41]

[26] Agencies can be supply or partnering, the agency owning the viewing entity is included. (In other words: a buyer belonging to an agency with no partners would only ever see a "1" in this output.)
[27] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[28] Not shown to seller: they don't see that column.
[29] Not shown to buyer: they don't see that column.
[30] Not shown to buyer or seller: they don't see that column.
[31] Ditto
[32] Ditto
[33] Only shown to BO users
[34] Agencies can be supply or partnering, the agency owning the viewing entity is included. (In other words: a buyer belonging to an agency with no partners would only ever see a "1" in this output.)
[35] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[36] Not shown to seller: they don't see that column.
[37] Not shown to buyer: they don't see that column.
[38] Not shown to buyer or seller: they don't see that column.
[39] Ditto
[40] Ditto
[41] Only shown to BO users

14.	**Users**	Top row	N/A													
		Column spans	Users	Parties			Activity				Totals					
		Columns		Agencies	Buyers	Sellers	Purchases	Bookings	Sessions	Hours	Charges	Pay	On-costs	Mark-up: proportional	Mark-up: fixed	System charge
		Outputs		Total number of unique agencies involved in the data below	Total number of unique buyers in the data below[42]	Total number of unique sellers who have carried out the bookings in bookings column in this table	Total no. of purchases by entities in the rows below	Total no. of bookings where the place of work is in the rows below	Total number of sessions in the data below	Total number of hours in the data below	Total of the "charge" column in the rows below[43]	Total of the "pay" column in the rows below[44]	Total of the "on-costs" column in the rows below[45]	Total of the "proportional mark-up" column in the rows below[46]	Total of the "fixed mark-up" column in the rows below[47]	Total of the "system charge" column in the rows below[48]

[42] Cells like this obviously require de-duping eg 93 bookings might have been made by 52 Buyers and fulfilled by 37 Sellers requiring 87 different roles.
[43] Not shown to seller: they don't see that column.
[44] Not shown to buyer: they don't see that column.
[45] Not shown to buyer or seller: they don't see that column.
[46] Ditto
[47] Ditto
[48] Only shown to BO users

5) COMPONENT TWO: Analytics expander

This facility requires a consistent set of design elements, each with our helptext icon top right. This pops up a short block of text in line with our helptext elsewhere. In order of display the elements are:

a) Timeline

This section is a graph presenting activity through the defined time period. The horizontal axis divides the time between start date and end date selected into weeks (if it is >7 days); or days (if the period is 7 days or less). If the time period is >12 months we would like it to use months as divisions. The graph then plots activity along that axis. The graph's key offers a total count for each entity bracketed in gray text.

The graph has three modes:

1) Purchases/Bookings/Sessions/Hours: ("Booking data"). This is an area chart showing the number of each entity by week in a date range, or by day if one week or less is selected. Ordering of lines is as just listed with Purchases at the bottom. The hours area is coloured our lightest colour with sessions in our next lightest tone and so on.

- The criteria for compilation is:
  - Every Purchase/Booking/Session/Hour that occurs in the designated week/day is given a "1". So a purchase of 5 sellers to work 2 shifts of 4 hours each would be tallied for the graph as:

Purchases	Bookings	Sessions	Hours
1	5	10	40

The question is always: "does any minute of this entity occur in this week/day?" If so, it is tallied.

- We display this graph on any reports screen that returns a "Bookings" column. Even data about entities like checks and roles can display bookings data. (There is a number of bookings enabled by any given set of checks or roles. That is the data displayed on those pages).

2) Proportions: This retains the horizontal axis but displays the hours each week (or day) attached to a given check/role/buyer/seller (for example; the roles contained in a set of booking data). It lists results in descending order of size. We may need to extend our palette of blues to 10 to fully represent each variable (from no. 10 down all can be the same colour).

- Within this mode we display the total % for each entity within the time period.

- This mode is the default when data in the returns relates to checks/roles/buyers/sellers rather than bookings.

3) Financial: This display retains the horizontal axis and the area chart format but outputs monetary sums over the time period. As above, these are ordered with the largest component on top. So, the graph can display (from the bottom) System charge/Agency mark-up/On-costs/seller pay.

- There are two variants:
  - **Total**: this displays the total sum for each of the 4 components from the rows below in that week or day. Totals attached to the label display total System charge, Agency, mark-up etc. from the data below.)
  - **Average**: this displays a mean from the same data. Totals display the overall average for each component for that data set.

Notes on the graph:

- Modes are selected through tickboxes above the graph. Only one display criteria can be selected at a time. The master list of display options are:
  - Booking data: Purchases (if user is allowed to see purchases, sellers are not) / Bookings / Sessions / Hours
  - Buyers
  - Sellers
  - Checks
  - Roles
  - Accounts
  - Bases (agency) / locations (buyer)
  - Made by (user who made the booking)
  - Financial (total)
  - Financial (average)

- Bands need colour coding. It makes sense, initially, to use the same colour coding we use for the AAG on buyerPurchaseBuild (5 shades of blue with darkest signifying “biggest”). There must be a key to colours displayed consistently. Also a label for the horizontal axis.

- By default the graph loads displaying numbers on the vertical axis (curtailed at the highest point the graph needs to reach). It can be toggled to display percentages. (What % of total hours in the returns belong in the designated week.)
  - The percentage option disappears when either of the financial variants are selected.

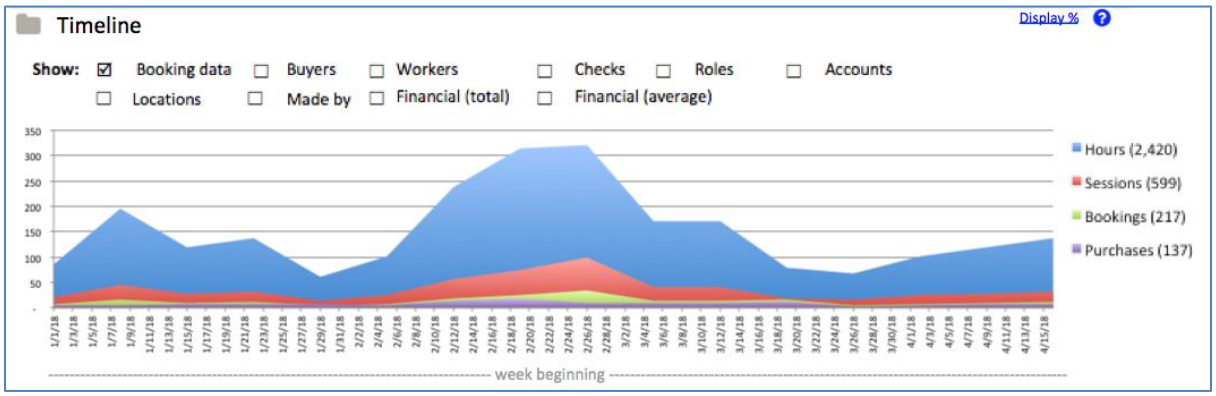
- There may be an issue with potentially hundreds of lines in Proportions mode (for example when Sellers is selected on a large dataset). WE may need to turn the key into a pop-up box, or separate page, for these instances.

Mock-ups

(Standard Excel colour coding has been used rather than our colour scheme. Totals are not displaying in gray as they should.)

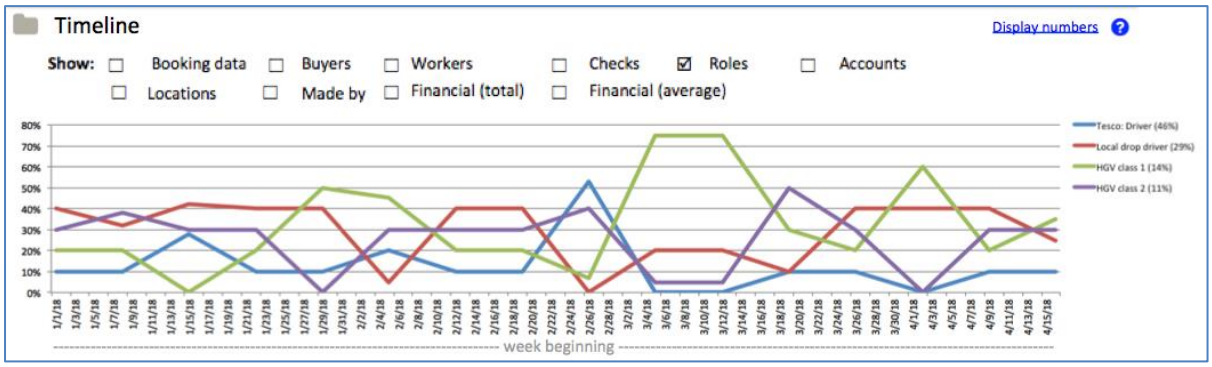
i) Purchases/Bookings/Sessions/Hours mode

Default load on a page of data about Bookings (after criteria have been input on agencyBookingsReportCriteria for instance):



ii) Proportions mode

This is the default graph on a page focused on roles (for example: agencyPurchaseContractLevelsManage). The "Display %" link has been clicked:



[redacted]

- [redacted] chart "Financials" is changed to "Pay". (Seller can only see details of pay and not additional mark-ups or charges).
- Ideally these charts would be divided by "week beginning" not "week ending". However, we want to be consistent with timesheets which are marked by "week ending". We need to discuss changing timesheets to "week beginning". If this is prohibitive we will standardize both timesheets and timelines across "week ending".

Helptext

This graph plots activity between the start and end dates you specified. If you date range is less than a week it will plot by days, otherwise by weeks.

To compile the graph we count the hours booked through the time period. You can see these as raw numbers or as percentages.

When “Financials” is selected: we either allocate the total of all sums from the rows below to a given week or day. Or we compute the average for each week or day.

Numbers in brackets are totals across the whole date range.

b) Locations

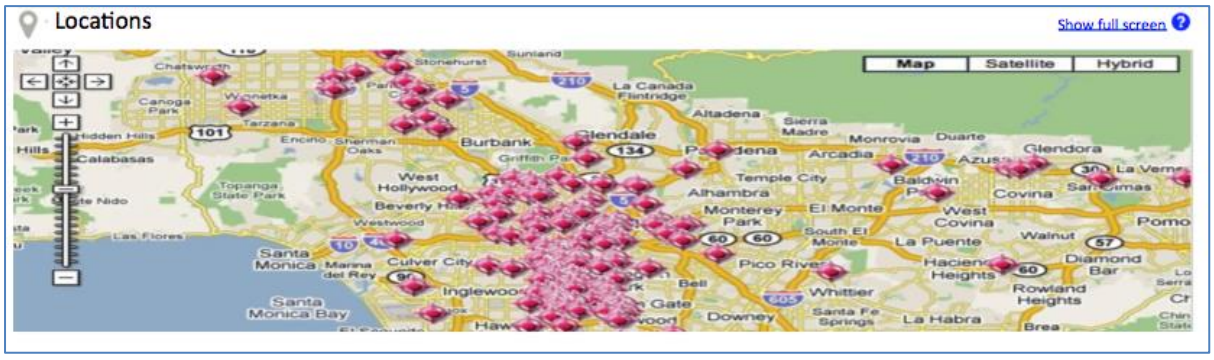
This section requires us to pull in a heatmap on which each entry in the location column on the rows below is plotted. As with activity and location data, this can display locations of bookings on pages for an entity such checks or roles.

Notes on the map:

- The map should frame just wide enough to include every pin.
- This section is the one most hampered by a letterbox format. (Activity graph and the AAG type grid both demand letterbox, Averages can align the tablets in any shape.) There is no elegant way round this; our map has to be wider than we would like. User must be able to expand map to a full screen (in a new window) with one click.
- The overarching aim of the map is to instantly show user a sense of where activity is clustered in their area. That can be done just with density of pins. But we would ideally offer 3D options or other forms of heatmap that can be found off the shelf.
- Ideally we would allow user to toggle what generates a pin. For example in rows about bookings User would be able to see a map where each pin represents a (a) Purchase (b) booking (c) Session (d) hour. Display could vary dramatically if, for example, there was a handful of very large purchases in the data in one place. (The Hours map might show even distribution but the Purchases view would show one area dominating.)
- Zoom: as is standard with Google maps, user should be able to zoom and move around the map within our page. (We already do this in our booking confirmation screens, eg buyerPurchaseDetails).
- Colour of pins: given the map itself is coloured we should again use the darkest blue of our AAG colours for pins in this section.

Mock-up of the locations map

(Colour of pins is incorrect.)



Helptext

This section plots each location in your search returns with a pin. We use a pin for each row so density of locations is reflected.

c) Days/times

We want to give user a heatmap of which times of the week their selected bookings cover. Our AAG (Aggregated Availability Grid seen in buyerPurchaseStart) offers an instant snapshot of the 7X24 hours in a week. We would like to populate a generic version (days only down the left hand side, no dates). This can collate data for one Seller or any defined pool of sellers.

There are two possibilities for how cells populate:

- **Numbers**: (default) each cell could show the number of hours at that time within the data below. (For example; there are 88 bookings returned, 37 of them included an hour, or part of an hour, of work between 13.00-14.00 on Sunday. That cell shows 37.)
- **Percentage**: each cell could show the proportion of all hours in the returns represented by that timeslot. So assume the 88 bookings above totalled 500 hours of work, 37 of them were on Sunday from 13.00-14.00. That cell would show 7%.

There are two options for the data displayed:

- **Hours booked:** (default) the number of hours of work within that cell for bookings in the specified parameters.
- **Booking made**: using data in a column for "Booking made" (the date/time a user made the booking in that row), we allocate a "1" to each cell for each purchase underpinning a booking or timesheet. The grid then displays numbers, or percentages with colour coding.

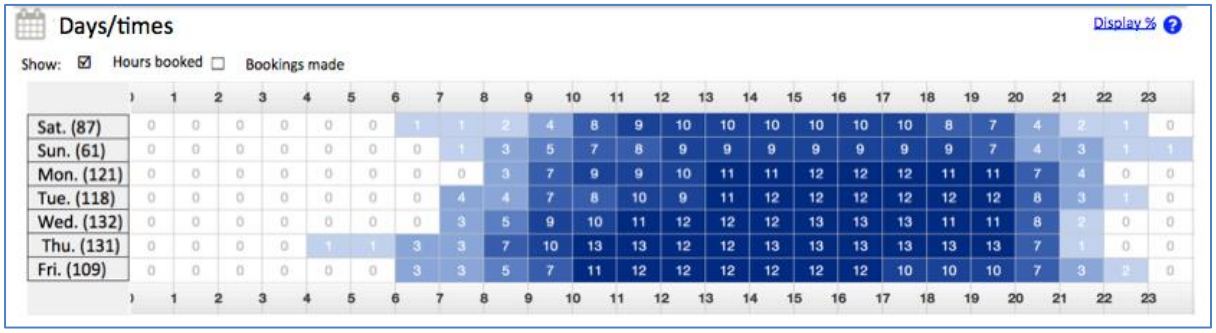
Points on the Days/times grid

- Again, the data labels total the hours (or part thereof). In this case it is a total-per-day in gray bracketed numerals next to the day of the week.
- Our preference is to load numerals by default but allow a toggle to percentages. Either way, the colour coding should mirror that of the existing AAG, clearly drawing the user's eye to concentrations of hours.
- We may need to review design details of the AAG and adapt them to ensure this new grid presents evenly while remaining consistent with an AAG.
- How does this output handle clock goes back/clock goes forward? We want consistency with the main AAG and seller's availability grid. But this display condenses data from multiple weeks. The obvious solution is to merge data so:
    - Assume clock goes back from 3:00AM to 2:00AM one week out of ten being displayed. That cell counts the hours of both the first 2-3AM and the second 2-3AM in its data. When clock leaps forward data from that one hour is counted as zero.

- As with activity and location data, this grid can display hours of bookings on pages for an entity such as checks or roles. *("I want to see what times babysitters are being booked for in the east of the city".)*

Mock-up

(Totals in the data label fields, and their brackets, should be in gray.)



Helptext

This grid condenses all the hours within bookings defined by your search. We can display the number of hours – or parts of an hour – booked in each hour of each day of the week. Or you can see the hours booked in each cell displayed as a percentage of the total.

The "Booking made" option collates the time at which booking in the list below was made. That is; the time a [BUYER] or agency user clicked the Confirm button after entering requirements for a booking.

- Bookings may be recurring. This means an authorized user has instructed this system to automatically repeat a weekly booking. These bookings are made by the software, often during the night.

The total for each day of the week is displayed next to the name of the day.

d) Parameters

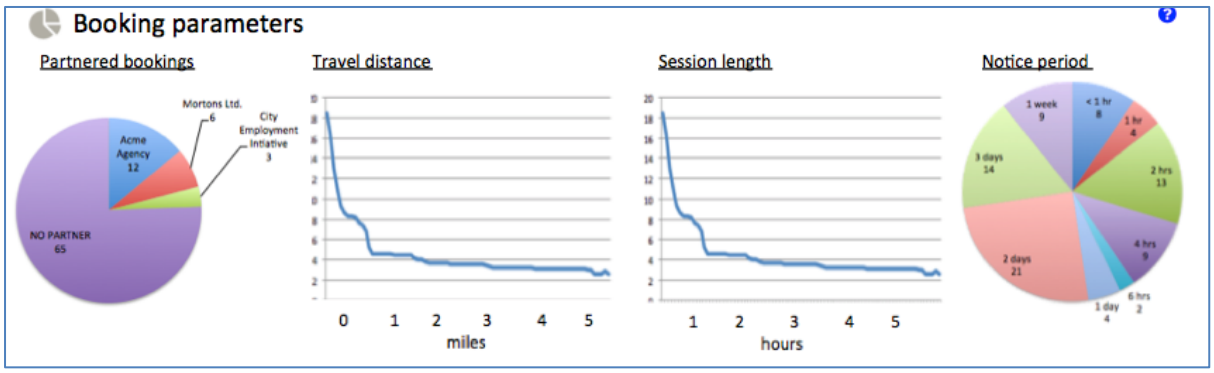
This section's title includes the singular name of the entity being searched (eg "Role parameters", "User parameters"). It proffers a mix of line charts, histograms and pie charts showing secondary information extracted from the rows returned. Typically it will be used on pages about Purchases/Booking/Timesheets. The outputs then are:

	Sub-heading	Output	Rules for compilation
1.	Partnered bookings	Pie chart	Of all the purchase or bookings in the data, how many are the result of a partnered agency arrangement? We tally the partners and those with no partner.
2.	Travel distance	Line chart	There is a travel distance for each booking (miles from Seller base to place of work). These are ordered into divisions of half a mile, a horizontal axis is allocated to accommodate them and each datapoint plotted on a line that counts number of bookings for that division.
3.	Session length	Line chart	As above. (But sessions in a booking can have different lengths so this data has to come from Sessions not Bookings.)
4.	Notice period	Pie chart	uFlexi has bands for notice periods (the time between a booking being made and the first hour of the booking). They can be seen for example on sellerRatesAndLimitsEdit. To compile this chart we assemble the period of notice for each booking in the rows and allocate a segment to each band. Again, colours should be consistent with the rest of the page.

In the case of three entities; bookings data is of less importance and the Parameters section is retitled. These are: Checks relating to Seller, Roles relating to Seller and Accounts. Details of headings and display for those pages follow.

Mock-up

(Colours are Excel default, not those we would use on screen.)



Helptext

This section displays secondary analysis from the data you have selected.

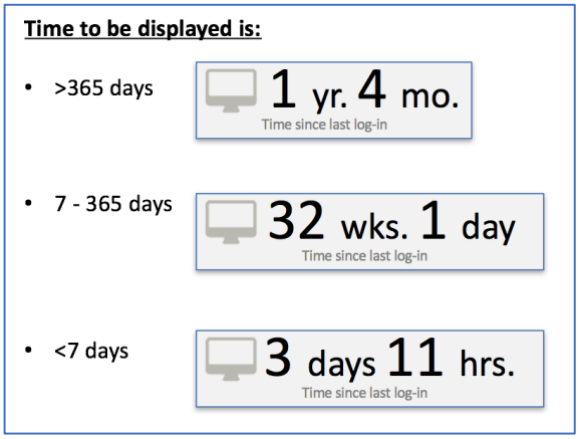
e) Averages

This part consists of a set of tablets unique to the entity being searched. Each comprises a border and background containing a relevant large icon in gray and figure in black. Beneath is a smaller label explaining the context. The border colour is the same gray as used in our section breaks (ticket 134). The background colour should be the secondary branding colour determined for that user. This is the colour input on agencyBrandingEdit or buyerBrandingEdit. Height of tablets is fixed. We anticipate three possible widths:

- **Small**: this is for non-monetary outputs such as average sellers in a booking.
- **Monetary**: this is for any sum of money that has to accommodate a currency symbol plus two decimal points.
- **Time based**: this is a flexibly sized tablet displaying, for example, average time since registration for a group of sellers. Time periods could range from hours to years. We need a consistent, intuitive way of displaying any period.
- The easiest way seems to be have different modes depending on the timespan. This needs to be done with smaller black text defining what units are being displayed. So:
  - If over a year: we display years + months: "[X] yr(s) [X] mo."
  - If between a week and a year: we display months + weeks: "[X] wks [X] day(s)"
  - If under a week: we display days + hours: "[X] days [X] hr(s)."

Examples of time-based tablets:

(displaying "Time since last log-in with icon FA_DESKTOP)

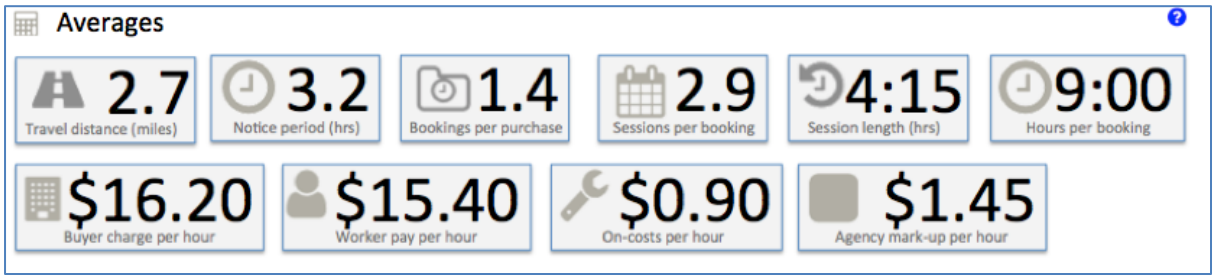


Points on the Averages section:

- Marshalling different sized tablets that will come in numbers determined by the user across multiple screen sizes requires some thought. Broadly, we want the tablets to stay in the order specified but accommodate themselves in the space available left justified so that any blank space appears to the right.

Mock-up

(This screen section covers bookings data being viewed by Agency, for example on agencyRecentPurchases. It assumes agency's background colour is light gray.)



Helptext

This section compiles mean data from the rows below. Rounding may account for marginal differences from totals in each column.

6) Analytics expander contents

TABLE: Contents of the Analytics expander as determined by entity being searched						
Entity being searched		Screen section (not in order)	Content			

Headings in the Averages section are for convenience only; the sub-headings are not displayed on screen.

1.	**Agencies**	Bookings parameters	As described above			
		Averages	<u>Parties</u>: Av. [BUYER]s approved Av. [SELLER]s approved	<u>Activity</u>: Time since approved No. Branches No. checks No. roles Purchases Bookings Hours per session Hours per booking	<u>Rates</u>: Av. charge per hour Av. pay per hour Av. on costs Av. mark-up: proportional (%) Av. mark-up: fixed	
		Timeline	• See master list above, defaults to “Booking data”			
		Location	Location of branches			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

2.	**Buyers**	Bookings parameters	Frequency of bookings Pie chart: segment each for: o Daily o Weekly o Monthly o Quarterly o Annual or above Data derived from analysis since market began	Sellers rated Pie chart: segment for each star rating level – must factor in ratings by any buyer in the dataset (one buyer may have rated one seller multiple times)	Date of last log in Line chart with X-axis sized from earliest date to today.	Date of last log in Line chart with X-axis sized from earliest date to today. (Counts the most recent log in by any user attached to the buyer)
		Averages	<u>Parties</u>: • Av. partner agencies used • Av. [SELLER]s booked (per buyer) • Av. [SELLER]s rated per buyer	<u>Activity</u>: • Time since approved • No. checks • No. roles • Locations • Purchases • Bookings • Hours per session • Hours per booking	<u>Rates</u>: • Av. charge per hour • Av. pay per hour • Av. on costs • Av. mark-up: proportional (%) • Av. mark-up: fixed	
		Timeline	• See master list above, defaults to “Booking data”			
		Location	Locations (places of work)			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

3.	**Sellers**	[SELLER] parameters	Market levels Pie chart: segment for each level	Rated by Buyers Pie chart: segment for each star rating level – must factor in ratings by any buyer in the dataset (one buyer may have rated one seller multiple times)	Age Pie chart with a segment for each decade: Teens / 20's / 30's / 40's / 50's / 60's / 70's / 80's / 90+)	Date of last log in Line chart with X-axis sized from earliest date to today.
		Averages	<u>Parties</u>: • Av. partner agencies worked through • Av. [BUYER]s who booked • Av. [SELLER] age • Av. market level	<u>Activity</u>: • Time since approved • No. checks • No. roles • Locations • Purchases • Bookings • Hours per session • Hours per booking	<u>Rates</u>: • Av. charge per hour • Av. pay per hour • Av. on costs • Av. mark-up: proportional (%) • Av. mark-up: fixed	
		Timeline	• See master list above, defaults to "Booking data"			
		Location	Default load: • Home address of sellers Alternative displays: • Locations (places of work) in bookings			
		Times	Hours of work in the bookings			

4.	**Bookings by Seller**	Analytics expander acts exactly as for a bookings page

5.	**Checks**	Bookings parameters	As described above pertaining to bookings involving all checks in the dataset			
		Averages	<u>Activity</u>: • Av. [SELLER]s requested[49] • Av. [SELLER]s active • Av. [SELLER]s withdrawn • Av. roles per check • Av. bookings per check	<u>Rates</u>: • Av. value per check		
		Timeline	• See master list above, defaults to “Checks”			
		Location	Locations (places of work) for bookings involving a Role dependant on checks in the rows below			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

[49] For clarity: this is the average of the no. of sellers who currently have “requested” status for checks in the rows below. (Likewise for the following columns.)

6.	**Checks applied to Seller**	[SELLER] parameters	<u>Check status</u> Pie chart with a proportionately sized segment for checks held by this seller at statuses: • Requested • Approved • Withdrawn	<u>All checks</u> Pie chart with a proportionately sized (sized according to no. of hours ever) segment for each check ever held by this seller	<u>Approved checks</u> Pie chart with a proportionately sized segment (sized according to no. of hours ever) for each active role currently held by this seller	<u>Withdrawn checks</u> Pie chart with a proportionately sized segment for each inactive checks (sized according to no. of hours ever) currently held by this seller
7.		Averages	<u>Activity</u>: • Checks per role • Bookings per check • Hours per check	<u>Controls</u>: • Time since check approved		
		Timeline	• See master list above, defaults to “Checks”			
		Location	Locations in bookings	Seller’s base location should be marked prominently		
		Times	Times of bookings			

8.	**Roles**	Bookings parameters	As described above pertaining to bookings involving all roles in the dataset			
		Averages	<u>Activity</u>: • Av. [SELLER]s offered • Av. [SELLER]s active • Av. [SELLER]s withdrawn • Av. checks per role • Av. bookings per role	<u>Rates</u>: • Av. value per role		
		Timeline	• See master list above, defaults to “Roles”			
		Location	Locations (places of work) for bookings involving a Role in the rows below			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

9.	**Roles applied to Seller**	[SELLER] parameters	<u>Role status</u> Pie chart with a proportionately sized segment for roles held by this seller at statuses: • Inactive • Active • Withdrawn	<u>All roles</u> Pie chart with a proportionately sized segment (sized according to no. of hours ever booked) for each role currently held by this seller	<u>Active roles</u> Pie chart with a proportionately sized segment (sized according to no. of hours ever booked) for each active role currently held by this seller	<u>Inactive roles</u> Pie chart with a proportionately sized segment (sized according to no. of hours ever booked) for each inactive role currently held by this seller
10.		Averages	<u>Activity</u>: • Checks per role • Bookings per role • Hours per role	<u>Rates</u>: • Earnings per role		
		Timeline	Defaults to “Roles”			
		Location	Locations of bookings in the graph above. Seller current base location marked			
		Times	Times of bookings in the graph above			

11.	**Accounts**[50]	Accounts parameters	<u>Ownership (all accounts)</u> Pie chart showing percentage of accounts in rows below held by each buyer	<u>Accounts active</u> Pie chart showing percentage of accounts in returns that are active and percentage that are inactive	<u>Ownership (active accounts)</u> Pie chart showing percentage of active accounts in rows below held by each buyer	<u>Controls</u> Pie chart showing percentage that have controls On and percentage that have controls off
		Averages	<u>Activity</u>: • Accounts per buyer • Bookings per account • Number of top-ups	<u>Rates</u>: • Amount used • Auto top-up • Contingency • Current balance: spend • Current balance: hours • Available		
		Timeline	• See master list above, defaults to “Accounts”			
		Location	Locations (places of work)			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

[50] This section does not apply to Accounts Audit reports suchn as agencyBuyerCostCentreAuditReportCriteria. The entity being searched on those pages are bookings.

12.	Purchases	Bookings parameters	As described above			
		Averages	Parties: • Bookings within these purchases involving a partner agency (%)[51]	Activity: • Bookings per purchase • Sessions per booking • Session length • Hours per booking	Rates: • Charge per hour • Pay per hour • On-costs per hour • Agency mark-up per hour[52]	
		Timeline	• See master list above, defaults to "Booking data"			
		Location	Places of work in the purchases in rows below			
		Times	Default load: • Hours of work in the bookings of these purchases Alternative displays: • Day/time purchases made			

[51] This is not technically an average but it is much more intuitive than displaying a proportion. We can live with the minor mislabeling.
[52] This is the sum of (mean proportional mark-up per hour) and (mean fixed mark-up per hour).

13.	Bookings	Bookings parameters	As described above			
		Averages	Parties: • Partnered bookings (Bookings involving a partner agency) (%)	Activity: • Travel distance • Notice period[53] • Bookings per purchase (if purchases displayed to user) • Sessions per booking • Session length • Hours per booking	Rates: • Charge per hour • Pay per hour • On-costs per hour • Agency mark-up per hour[54] Sessions per booking	
		Timeline	• See master list above, defaults to "Booking data"			
		Location	Default load: • Place of work Alternative views: • [SELLER] base address • Both (see note to right)			There is a specific issue in location data about bookings: the relationship between two data points is invaluable. They are: • Place of work in the booking • Base address of Seller doing the booking. We would like to be able to map these two co-ordinates in relation to each other. This supposes a map with a series of lines (connecting the two addresses in each booking.)
		Times	Default load:			

[53] This is the days/hours/minutes between the booking being made and the start of the period of work. See the bands used for calculation on seller's My Terms screen.
[54] This is the sum of (mean proportional mark-up per hour) and (mean fixed mark-up per hour).

			• Hours of work in the bookings Alternative displays: • Day/time booking made			

14.	Timesheets	Bookings parameters	As described above			
		Averages	Status: * *Tablet for each status possible for a timesheet with % fitting that status*[55]	Parties: • Timesheets with partner agency (%)	Activity: • Sessions per timesheet • Hours per timesheet • Session length	Rates: • Hourly charge per timesheet • Hourly pay per timesheet • Hourly on-costs • Mark-up: proportional (%) • Mark-up fixed • System charge
		Timeline	• See master list above, defaults to "Booking data"			
		Location	Places of work in the timesheets			
		Times	Default load: • Hours of work in the timesheets[56]			

[55] Timesheet statuses are under review and the current list should be pulled out of Codebase

[56] (not the overall bookings behind the timesheets)

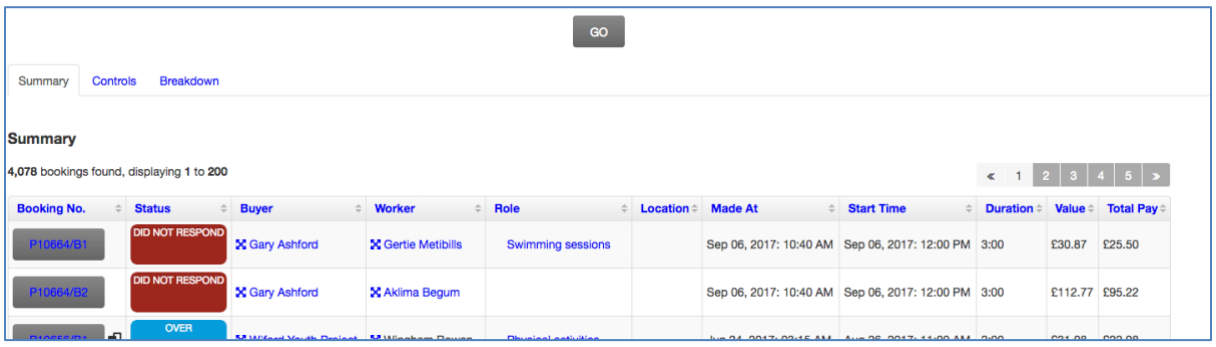
15.	Bases/ Locations[57]	Bookings parameters	As described above			
16.		Averages	<u>Parties</u>: • Av. bases per agency (bases only) • Av. locations per [BUYER] (locations only	<u>Activity</u>: • Users per base/location • Av. [BUYER]s per branch (branches only) • Av. [SELLER]s per branch (branches only) • Av. bookings per location (Locations only)	<u>Rates</u>: • Av. total charge per branch (branches only) • Av total pay per branch (branches only) • Av. total charge per location (location only) • Av total pay per location (location only)	
		Timeline	• See master list above, defaults to "Booking data"			
		Location	Location of branches or locations in rows below			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

[57] Agencies have branches, buyers have locations

17.	Users	Bookings parameters	As described above			
18.		Averages	<u>Activity</u>: • Av. time since registration • Av. time since last log-in • Av. [BUYER]s per advisor (branches only) • Av. [SELLER]s per advisor (branches only) • Av. bookings per location (Locations only) • Bookings per base/location	<u>Rates</u>: • Av. total charge per user • Av total pay per user • Av. total on-costs per user • Av. total mark-up per user		
		Timeline	• See master list above, defaults to “Booking data” •			
		Location	Locations of users			
		Times	Default load: • Hours of work in the bookings Alternative displays: • Day/time booking made			

7) Assembling the Analytics section

Currently, our search pages return rows directly underneath the Search button (labelled GO at this time):



This module will change that so that part of the page (agencyBookingsReport in this example) loads like this:

When the "Show analytics" link is clicked, the section illustrated on page 4 of this document opens.

Points on presentation of the expander:

- If the analytics screen is slow being returned can we offer the spinner we use as the AAG loads in buyerPurchaseBuild but with wording "Calculating analytics".
- It has a heading " FA-EYE icon: This section analyses the [ENTITY BEING SEARCHED] produced by your search"
- Each of the five sections has our standard section sub-divider (ticket 134) plus the icon as illustrated and a standard section heading.
- At the bottom of the section is a "Hide analytics" link.

- At the very bottom is our export buttons. We need to plot how to export the data most usefully so like-for-like columns can easily be pasted from multiple spreadsheets into one for comparisons.
- Ideally, the content will animate onto the screen as the expander loads. Amazon do this with any product page: the ratings bar charts load empty then populate as that point in the screen is reached. This is the filled in display:

(There is more examples at: https://www.pinterest.co.uk/pin/307863324509860238/visual-search/?x=12&y=9&w=376&h=282). We do not want graphs that are in constant movement. Only that the empty graphs load first and within about a second, all the contents have been filled in. The same animation is seen when a display parameter is changed for example in the Timeline graph.

- The expander and Summary table must not change export of the main rows returned (the export option at the very bottom of a set of search returns). User can export summary or analytics data independently. But if they click an export option below the returned rows it must behave as it would before this module.

8) ANALYTICS VERSION: Management analytics

a) Overview

Our analytics module can usefully be applied to an individual Agency, Buyer or Seller. Broadly, it covers bookings pertaining to that entity and is conveniently viewable by the higher entity as well as the entity themselves.

For example: when Agency is on the Manage Seller screen they have a link "Analytics". It loads our Summary table and Analytics module about that Seller's bookings.

b) Presentation

This version requires these three links:

Page	Placing of "Analytics" link	Link lands on
backofficeAgencyDetails	To left of screen above the table, below the main menu options for that agency.	backofficeBookingsReportCriteria
agencyBuyerCoreDetailsEdit	Below the table that ends with "Date joined this system" above the sub-dividing line atop the Details section.	agencyRecentPurchases
agencySellerDetailsEdit	Below the table that ends with "Hours sold" above the sub-dividing line atop the Details section.	agencyRecentPurchases

After the previous parts of this ticket have been completed: Each entity will already be able to see their own bookings analytics using these pages:

agencyRecentPurchases
buyerPastPurchaseSearch
sellerJobHistoryView

c) Behaviour of landing page

In each case the landing page loads with the expander already open and the Summary table at the top of the screen. The data used for inputs are the name of the entity in the name field and no other criteria. In other words: as soon as the link is clicked the user should see the graphic overview of the entity's entire history of bookings with all rows below. They are also able to spool up to find search input boxes and input additional filters.

9) ANALYTICS VERSION: Market Overview

a) Overview

So far, this document has focused on our Analytics suite as it appears in an existing report screen, only accessible to a logged-in user. We also want to make these tools available to non logged-in users who might be asking questions like:

- *I am interested in trends in low-skilled labor markets and want to understand what is happening in my area.*
- *Should I be selling my time in this market? How much might I earn with my skills and when would I want to be available?*
- *My company is looking at opening a distribution hub in this area. How deep is the supply of experienced warehouse operatives for extra shifts and where are they being deployed at present?*

Enabling this kind of enquiry by someone who has no relationship with uFlexi requires a modified version of analytics. The overriding aim is protecting user confidentiality. Specifically, our Market Overview page:

- Is limited to a report on bookings.
- Has controls on size and consolidation of the dataset being summarized.
- Blurs the heatmap in our Locations section.
- Does not show the rows of data being summarized.
- Is subject to Back Office controls that can exclude named Agencies, Buyers, Sellers or search/display parameters from these pages. The entire function can also be disabled.
- Does not permit export of data.

b) Presentation

Market Overviews sit within our Directories function (which is already designed for non-attached users). The menu for Directories requires a new tab, above "Contacting Market Users". The link "Market Overview" lands on a new screen. The screen is a modified version of agencyBookingsReportCriteria, Agency's report screen for bookings after the earlier parts of this ticket have been completed.

- The screen comprises:
    - Heading "[ICON-FA-EYE] Market Overview"
    - Search inputs as for agencyBookingsReportCriteria (see ticket 439) but omitting any inputs that could identify individual actors. These include; agency/buyer/seller name
    - The only search inputs that appear on a Market Overview screen are:
        - Check
        - Role

        - Renumeration type (when relevant to the present Agency)
        - Location
        - Date range
    - Our Search button

When the button is clicked the page returns a Summary table and link to the Analytics expander as on agencyBookingsReportCriteria. (But no rows, tabs or export links below the Analytics section.) Above the Summary table is gray text:

"Search inputs can be changed using the boxes above"

At the bottom of the screen is gray text:

"Some data may be excluded from this search to protect our users"

Pre-loading a date range

This is a snapshot screen, offering a glimpse of activity to a user denied any real context or drill-down search capability. We want it to be instantly gratifying, encouraging repeat visits, rather than immediately demanding a range of inputs.

So, it should load with a default search (which acts as a saved search does in ticket 439). That search is: all inputs blank except date range which is determined by uFlexi. There are two options for the date range setting:

- **Fixed**: the date range is set at a fixed timeframe, 4 weeks seems best. So the inputs with which the page loads are:
    - Start date: 28 days ago
    - End date: Today

- **Dynamic**: Ideally, we would have a rule that shrinks the time frame as a market deepens. The rule might be:
    - If search on the last 52 weeks returns > 2,000 rows run search for 28 days
    - If the search on 28 days returns >2,000 rows run search for 14 days
    - If the search on 14 days returns >2,000 rows run search for 7 days

This rule, coupled with our minimum size of dataset (below) should ensure that as a market deepens, the user sees ever more recent data but always on an intuitive horizontal axis.

Screen loading point

We want opening the page to instantly show interesting data. So, the page should load:

- With the search already run and the Analytics expander already open.
- With the gray text "Search inputs can be changed using the boxes above" at the top of the screen.

In other words, as soon as a user clicks on a "Market Overview" link – either in our Directories section, or in an external site – they land straight on a Summary table and Analytics snapshots of last week's activity across the whole uFlexi marketplace. They immediately see text showing them how to enter a personalized search instead.

c) Imposing limits on the dataset

We have to ensure this facility is not used to determine hours of work of individual Sellers or business activity of a Buyer. We intend a broad picture of local flexi-work, not a go-to tool for stalkers and competitors.

Keeping analysis high-level requires us to make sure only a search that produces a large, diverse data set will be summarized. This must be such that patterns of any one Buyer or Seller is not clear and cannot be triangulated by entering a Venn diagram of searches.

Specifically, we need three checks on any dataset before it is fed through to a Market Overview screen:

- **Size**: there must be enough bookings in the mix to avoid individual sessions being pin-pointed. Assume, for example a rule that at least [100] bookings have to be in the set.
- **Buyer concentration**: the largest buyer in the data set must account for <[40]% of the hours booked.
- **Seller concentration**: if sellers in the dataset are ordered by most hours in that set, the top seller will have fulfilled <10]% of the hours in the set.

The three figures in brackets are variables to be set by a Back Office superuser. That requires a new section at the bottom of backofficeSystemSettingsEdit. ([X] represents an input box.)

Market Overview dataset limitations

Minimum size: [X] rows
Buyer concentration: largest buyer booked <[X]% of hours
Seller concentration: dominant seller fulfilled <[X]% of hours

If returns for a selected search are not compliant with any of these checks we display this text on the user's screen:

"We're sorry. Data produced by this search are subject to privacy controls. Try a wider search."

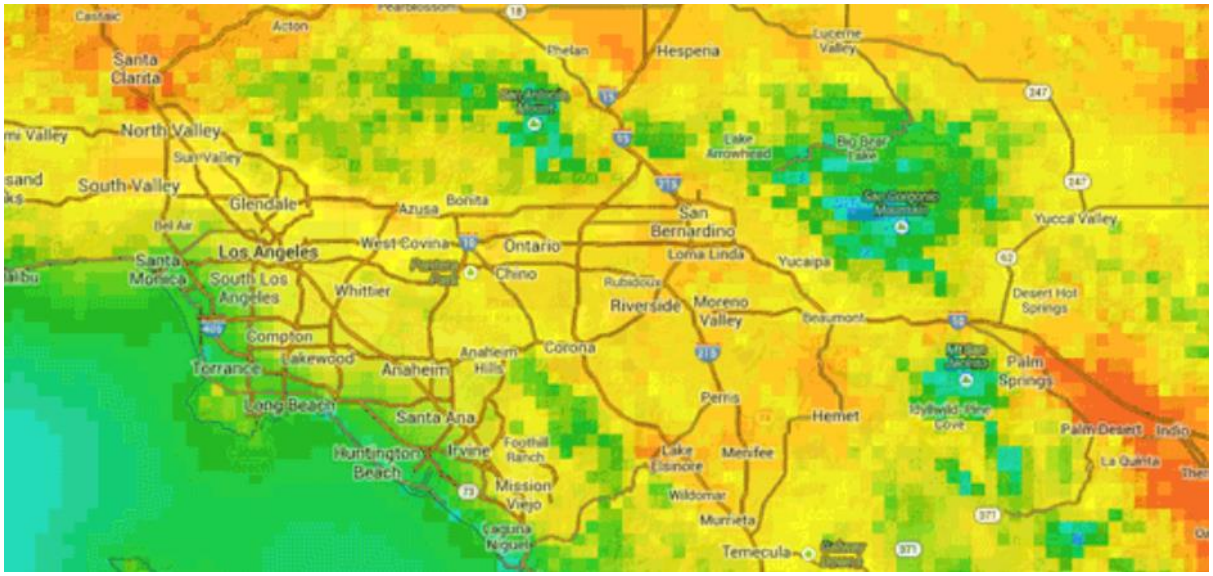
d) Protecting proprietary Checks/Roles information

Our Timeline section allows the % of activity related to any given check or role to be tracked over time. This could be too revealing where the check or role is buyer-specific. (Marriott should not see how many bar staff where hired for Hilton roles last year.)

To resolve this: in Market Overview mode our Analytics tool only shows checks/roles at folder level. It tracks booking of sellers with driving licences but not those with the check “Asda driver” or “Tesco driver”.

e) Fudging the locations map

Our locations section must offer more of a general shading than a specific set of pins. For example:



Notes:

- A key would need to be added to show which colour represents most bookings and which represents the least but there is no further quantifying of the degrees.
- Again, we aim for a dark-to-pale palette of one primary colour, the AAG’s blue scale:
- The map loads on a minimum width of ten miles across and cannot be zoomed in below that. It is vital the map is just a generalized indicator of activity and doesn’t create pinpointable hotspots which could be accounted for by one buyer.

f) Removal of search options

Making booking data publicly available requires a balance between transparency and protecting individual users. We need a means for fast response if we become aware an embittered-ex or predatory rival is managing to use our Market Overview outputs in conjunction with external data to establish details they shouldn't.

Back Office therefore need a way of excluding any of the following from Market Overview searches:

- Named Buyers
- Named Sellers
- Named Roles (Buyer specific roles will already be excluded under the Buyer concentration rule, but it may be that one role can be correlated with other data to deduce commercial secrets; for example bookings of X-ray technicians in an area with only one hospital but lots of non-medical buyers.)

This is best achieved through a page accessible by Back Office Superusers and Managers only. Accessed through a menu link: "Market Overview controls" , the page Heading is the same as the link. If offers these options:

Remove Buyer from search.

Remove Seller from search.

Remove role from search.

Each brings up a selection box of alphabetized entities from which individuals can be selected for removal. (Roles may be located through our folder structure if that is easier.) The screen then maintains a list of the entitles removed with date/time of removal of each and the user who did the removal. There should be an option to reinstate by each.

This screen is only available to senior Back Office users. Its display need not be of high standard.

g) Removal of Market Overviews

There will be times when our overviews are working with such small datasets they cannot comply with our user protections above. In these cases we want to turn off the overview altogether. That means menu links described above disappear and the page cannot be loaded.

This is best done at agency level and requires a tickbox at the bottom of backofficeEditAgency:

"Enable Market Overview? Y/N"

Selection defaults to No. (A new agency will be unlikely to have rich data until a few weeks after set-up.)

h) API

It is particularly important that the Market Overview display – in part or total - be easily available to sit within other websites. For example; a local employment initiative might want to build the timeline graph into its homepage as a broad indicator of local economic health.

We are working to make all our content readily available to any other site. It may be that we need to do preliminary work on this screen's components ahead of a main API project.

10) ANALYTICS VERSION: Personalized overview

a) Overview

There is a hybrid of our Market Overview and known-user analytics that can give individual users a gratifyingly instant look at the market around them. Again, this requires a pre-set search in a page that lands on the loaded Summary table and Analytics section. The page is slightly different for each of our three classes of primary users. So, for example, a Seller need only click one link on her homepage to see an overview of activity involving her roles in her travel area.

b) Presentation

Each user gains a link on their home page underneath the welcoming salutation. The link reads: "What's happening in my market?".

Clicking the link brings up a screen presenting and behaving as the Market Overview does. Search inputs are likewise truncated so individual users can't be searched. But search parameters that were pre-loaded are specific to this user.

c) Pre-loaded search parameters

The parameters used to search on this screen are:

<table>
<tr><td rowspan="2">User</td><td colspan="3">Search parameters that are pre-loaded</td></tr>
<tr><td>Roles</td><td>Location</td><td>Date range</td></tr>
<tr><td>Agency</td><td>All roles ever booked by buyers of this agency</td><td rowspan="2">User's location with a radius of 10 miles</td><td rowspan="3">As for Market Overview (see section above "Pre-loading a date range")</td></tr>
<tr><td>Buyer</td><td>All roles this user has ever booked</td></tr>
<tr><td>Seller</td><td>All roles currently active for this Seller</td><td>Seller's base zipcode with a radius of their total travel area</td></tr>
</table>

d) Controls on Personalized overviews

Personalized overview follow all the rules of Market Overviews. If the dataset is non-compliant an apology message is returned. Entities excluded from those searches are excluded in this case. If Market Overviews are disabled so are Personalized Overviews.

The only variant from the rules above is that the entity viewing the page is not counted for the purposes of privacy protection. For example, assume:

- The Seller concentration threshold is 10%
- The Seller viewing this page features in 20% of the bookings in the dataset

This would not trigger refusal to display the page. (The Seller does not need his privacy protected from himself.) The test is simply applied to the second Seller in the list. If they have >10% of the remaining bookings the page is non-compliant. The dataset must pass both the other tests before display.

Controls on other entity's data

Personalized Overviews throw up a conflict between two of our bedrock rules:

- User cases cannot see data confined to other user classes (eg sellers can't see buyer's charge data).
- User should not have inconsistent data presented in related pages

Ordinarily, we wouldn't allow a logged-in seller to see details of a charge rate. But they can do so in a generalized way using the new Market Overview screen (above). Therefore we may as well allow it on the Personalized Overview screen.

The key distinction is that both of the Overview screens present only fuzzy, anonymized data from a dateset that may or may not have had some players purged. This is very different from allowing a seller to see specific data pertaining to buyers of identifiable bookings.

11) FURTHER OPTION: Utilization rate

a) Overview

Utilization Rate (UR) is a particularly valuable metric from our markets. However, it requires storage and processing of new data and should be costed separately. A Utilization Rate (UR) is the ratio of hours offered to hours sold for any defined pool of available hours.

This can be uniquely informative for a seller deciding which roles to pursue, an agency needing to know which sellers need help or a buyer wondering whether to induct a new intake of sellers for a specific role.

b) Calculating a Utilization Rate

A UR quantifies the proportion of a defined set of hours of availability that ended up being booked. It could refer to one of three core entities:

- **Seller**: Mary Smith had 40 hours she wanted to work last week, she had 20 hours of bookings. Her UR was 50%.

- **Role**: sellers with the role of Home Nurse set at active had a total 10,000 hours of availability last month, there were 1,000 hours of bookings of those people as home nurses. But this group had another 2,300 hours of bookings in other roles. This means UR for a role has two possibilities:
    - The role specific UR for Home Nurses was 10% (the proportion of all hours that could *possibly* have been booked - if sellers could be tempted to work as home nurses above any other role available to them - that were booked)
    - Their all roles UR was 33% (3,300 of home nursing hours were purchased to do *something*).

      "All roles" UR is our default measure. It tells a buyer how many hours were left in the market in reality. Ideally we would allow a toggle to "role specific" anytime UR is displayed. When displayed on our Timeline graph, UR should present as an area chart (as booking data does). The top line is hours offered, middle line is all-roles UR, bottom line is role-specific UR.

      For clarity: Search can include a group of roles. *("I want to see UR for all types of cleaning work in the last quarter".)* In this case we treat those defined roles as "role specific" and any other roles performed by the Sellers as "all roles".

- **Agency**: Acme Staffing Solutions had 100,000 hours of seller availability last year, 250,000 were booked by Acme or their partners' buyers. Acme had an annual UR of 25%.

- We already calculate a forward UR for agencies, displaying it on their homepage. This is a useful measure that is untouched by this ticket. But we also want to compile their historic UR's.

Any of these parameters can be clustered within our searches of course: *"I want to see the UR for sellers with the "registered student" check doing any work in the Medical roles folder".*

Helptext

UR is useful but new to most of our users. When the Timeline Graph is displaying UR it needs to gain a helptext icon top right. That offers this text:

> "Utilization Rate" is the ratio of hours available from a set of [SELLER]s to the hours booked for those [SELLER]s. If you are permitted to see the underlying data, we can display utilization for any defined group of [SELLER]s.
>
> We can also output utilization for a role. This can answer queries such as: "How much demand was there for bar staff in the city center over the last three months?". The Utilization Rate for a role has two versions:
>
> - All roles: this takes the pool of [SELLER]s who were available for bar work and measures how many were booked for *any* role in the chosen date range. (For example; a [SELLER] who does bar work may also be a gardener, delivery driver and kitchen assistant.) This is a good measure of how many hours were actually unsold. If all roles utilization was 65%, that means 35% of bar staff hours remained available to [BUYER]s.
> - Role specific: this calculates only the hours booked for bar work. It is a good gauge of how valuable the role is to [SELLER]s. Continuing the example above; if the role specific Utilization Rate was 3% it tells us people who are available to do bar work were actually doing other work instead.

c) Storing historic availability

Computing UR requires a look-up of the availability of a defined group of sellers over a defined time window. But availability can change endlessly. We need a definition that ensures fleetingly entered availability or, blocks of availability that were withdrawn because the seller found something else to do outside uFlexi are not counted.

The definition of countable availability is:

- Any full hour for which the Seller input availability at least 30 minutes before the start of the hour and for which he was still available, but unbooked, at the start of the hour.
- The seller ceiling has to be factored in. A Seller might list 40 hours of availability but be subject to Working Time Control (via agencyWorkingTimeRestrictionSellerManage), or an Agency imposed ceiling (on

agencySellerDetailsEdit) or a personally imposed ceiling (on sellerRatesAndLimitsEdit) that is lower. Therefore we only count the maximum hours for which the Seller ***could*** have been booked. That will be the lower of:

- The absolute ceiling on number of hours given the controls just listed
- Countable hours input on the availability grid on sellerHome

d) Output of Utilization Rates

If we can compute UR's, they are to be merged into our Analytics expander as follows:

- **Timeline**: "Utilization rate" becomes a tickable option. It creates a "proportions" display (averaged UR week by week or day by day for the Sellers defined by the search). The tickbox comes between [SELLER]s and Checks.

- **Days/Times**: our AAG-like grid can be switched to display hour by hour UR's. The option comes as the last in the list every time.

- **Averages**: we display an average percentage for the UR derived from the dataset in a tablet that comes before the first monetary amount tablet in each screen.

12) FURTHER OPTION: Abandoned bookings analysis

There is another prospect we would like explored that requires storing additional data and separate costing. It allows uFlexi to report to BO/agencies/buyers on purchases abandoned without any sellers being booked.

a) Overview

Knowing how often a customer looks at what is available but decides not to buy and the parameters of those failed transactions is a key metric for any e-commerce site. We could capture these data with some simple rules. We then make it available to agency and buyer superusers. (This is sensitive information and should not be shared freely.)

Our definition of a failed purchase cannot be watertight. A user may be idly curious about the market so trialling booking criteria, or unauthorized to make bookings. But we can set a threshold for an "Abandoned booking" and report on that with wraparound text putting figures in context.

b) Rules

I. Definition:
   - An "Abandoned booking" is one where user has accessed buyerPurchaseStart or agencyPurchaseStart and got as far as loading the AAG but then not booked a seller. (In other words: they saw what the market had to offer but did not proceed.)

II. Data capture:
   - For every Abandoned booking we store the inputs:
     a. Date/time
     b. User ID
     c. Buyer
     d. Role
     e. Location
     f. Any inputs in the AAG (ie any hours selected)

   - Ideally, we would store some sense of the returns they faced (ie a way of recreating the AAG as they would have seen it).
   - Again, ideally; we store the following 9 weeks of AAG's they could have clicked through at the time.
   - Ideally, and even more challengingly, we also store: the Sellers/rates who would have been available for any slots they selected.

c) Output screen

I. Access and top of screen

- Only BO, Agency and Buyer superusers can see failed bookings analysis. It is accessed through a tab in their Reporting menu at the bottom of the "Activity" section. The tab reads "Abandoned bookings".
    a. The icon is FA-BAN.
    b. Helptext:

> Abandoned bookings are those where a user has entered requirements for a role (type of work) and location and has viewed the grid of [SELLER] availability but then not booked anyone.
>
> A booking may not proceed for many reasons. The user could just be curious about local market conditions. Or they may not have authorization to book. But a pattern of abandoned transactions may suggest a [BUYER] who has needs the market is not yet meeting.

- Clicking the link opens a set of Search inputs mirroring those for any screen about bookings: see for example agencyBookingsReportCriteria after ticket 439 has been completed. The following fields are absent:
    c. Status
    d. Reference
    e. Accounts
    f. Date range of booking (the Date range only allows search on "date made").

II. <u>Summary table</u>

- Clicking the search button returns a Summary table for bookings data (see this ticket, Section 3). The leftmost column is headed "Abandoned bookings" and shows the number of rows below. The table then does <u>not</u> have the following columns:
    a. Purchases
    b. Bookings ("Abandoned bookings" are actually abandoned potential purchases in system terms)
    c. Sessions
    d. Hours
    e. Sellers
    f. The entire "Totals" cluster of columns.

- There is a row below for each Abandoned booking. Again the columns mirror those for any screen about bookings (eg agencyBookingsReportCriteria after ticket 422 has been completed). Columns that would always be blank (such as seller details) are absent.

III. <u>Analytics expander</u>

- The Analytics expander (this ticket section 5) offers a truncated view of the expander for a screen about bookings data. Specifically:

- Heading is “[ICON-FA-EYE] This section analyses the Abandoned bookings produced by your search”
- Timeline graph
  - Only shows purchases in the “Booking data” view: we don’t know anything about bookings/sessions/hours.
  - [SELLER]s/Accounts/Financial (total)/Financial (average) tickboxes are absent. Utilization rate is not displayed if it is in place.
- AAG
  - Displays times entered or time bookings were made. (Many Abandoned bookings won’t have any hours selected so we can only aggregate the selections we have.)
- Booking parameters
  - There is only element; a pie chart showing ratio of completed bookings to abandoned bookings for the present agency (or group of agencies) in the defined time period.
- Averages section
  - This does not appear

For clarity: Abandoned bookings data appears at no other point in the system except this new page for our three classes of superusers.

13) FURTHER OPTION: Animated timelines

a) Overview

There is a visually captivating way we could present our pools of data: an animation that unfurls progression over time. The mesmerizing quality of these displays is famously illustrated here. Our displays are more complex so this needs to be considered a separate, desirable but inessential, project.

In uFlexi, a user might have defined a dataset such as *"out-of-school youth from deprived areas working in my city center over the last year".* They can then click a link and the screen shows for example; bookings mounting week-by-week, roles changing with time, hourly pay rising, locations ebbing and flowing around the city and days/times fluctuating before, probably, settling into a pattern. This could be a breathtaking display of outputs for funders of an intervention designed to get troubled young people into the workforce.

To delver this: our Analytics expander gains an "Animate timeline" link. When clicked it allows any selection on the expander's content to change from one day or week to the next, either manually, or smoothly run by the system.

b) Rules

Underneath the section heading ("This section analyses [ENTITY]s produced by your search") is a small link "Animate timelines". It toggles to "Display static data". The later link displays the whole dataset without movement (apart from the possible initial animated population of an empty graph described earlier.)

When Animate is clicked:

I. Navigating the timeline

- The timescale at the bottom of the timeline (which could be in weeks or days, possibly months) is replicated at the bottom of each of the expander's 5 sections.
- Each section loads with data from the first day or week on the timeline. On the Timeline the rest of the graph to the right is blank.
    - By each timeline is a PLAY symbol (as seen on YouTube, Spofity etc.) This moves the slider along the timeline at a steady pace until the full data is revealed.
        - Ideally we would have inputs to change pace of the slide. They could be modelled on Powerpoint's "Slide Show" settings.
    - On each timeline is a slider that user can move along to progress display a given week or day manually.

- If the slider is in PLAY mode it can be stopped manually. If it is in manual mode, selecting PLAY moves it to the right from that point, it does not reset to the far left.

- As one slider moves, the others also move to the same day/week.

II. Data displayed above each slider

- As the slider moves along (either manually or automatically):

  - The Timeline graph builds a history, showing data to the left of the slider but with blankness to the right until the end is reached.
  - Each of the other 4 sections distils data for the day or week pertaining to the slider's current position.

c) Notes

It is possible this functionality could not be offered in mobile.

We want to make it easy to convert a particular section when animated into a upload into sites like YouTube. *("Here's what's been happening for our students in the workplace this year".)*

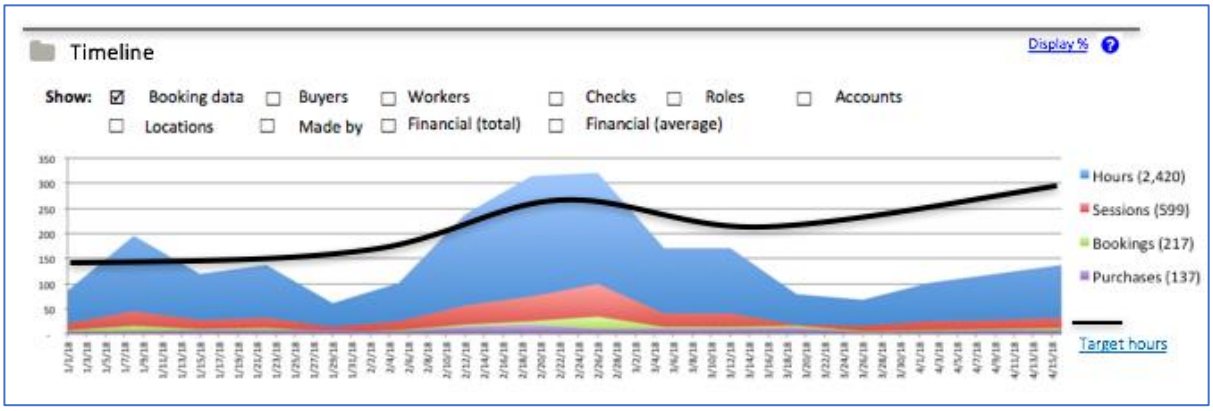
Any user attempting this journey should have to clear a pop-up reading: "Your data may allow activities by individual users to be identified. Are you sure you want to proceed?"

14) FURTHER OPTION: Target lines

a) Overview

This functionality is another nice-to-have that should be costed outside the core Graphic Analytics module. It is particularly useful for our forthcoming Market Making application but has other possibilities and should be treated as a generic part of the Analytics toolkit.

A Target Line is a metric for number of hours in the Timeline graph for a specific dataset. It is set by a high level user. With the line activated a Timeline looks like this when in "Bookings data" mode:



Usecases for a Target line include:

- Workforce Board: "*We have agreed with the city's hotels that if we fund training for 500 extra room attendants there will be at least 5,000 of their hours bought each week until Christmas".*
- Market initiator: *"I want to show the Mayor how close we are to achieving the minimum number of hours required to launch a market in her city".*
- Agency: *"We want to show all our users the estimated peak in demand for retail staff in the city center over the holiday period".*
- School Principal: *"I want my students to give 200 hours a week to the community service, rising to 500 a week after exams".*
- Buyer: *"I have a budget for the year and need to plan the hours booked, I want to show my managers the appropriate ceiling for each week".*

b) Rules

- A Target Line (TL) can be input against a defined dataset for any defined period (past, future or spanning both).
- A TL can only be set by any BO user or Agency/Buyer Superuser on any dataset they are permitted to view.
- A TL is only applicable to the "Booking data" view of a Timeline graph.

- A TL can have a series of extensions (up or down movements) at precise dates. These pivots are rounded for display.
- If a TL is current for any given dataset it is displayed on the Timeline graph when it loads. The TL may not cover all a selected date range. Only the section of the TL within the selected date range is displayed.
- If a TL is to be displayed it may require resizing of the vertical axis of the Timeline graph. This occurs where the TL is markedly higher than the hours booked at any point.
- A TL can only be defined in increments of a week. If the date range is <7 days and the Timeline is displaying one week only, the TL displays as a constant for each day of that week. If we can accommodate monthly displays for date ranges >52 weeks, the TL would ideally average across each month.
- The TL may extend chronologically beyond bookings data being displayed. Assume user has entered Jan 1, 2018-Dec. 31, 2018 for their search. There is a TL covering the whole of this period. But it is now mid-May and bookings peter out after June. The right hand side of the area chart will be blank but the TL will display across the entire area.
- A TL does not appear in data exports (for now).

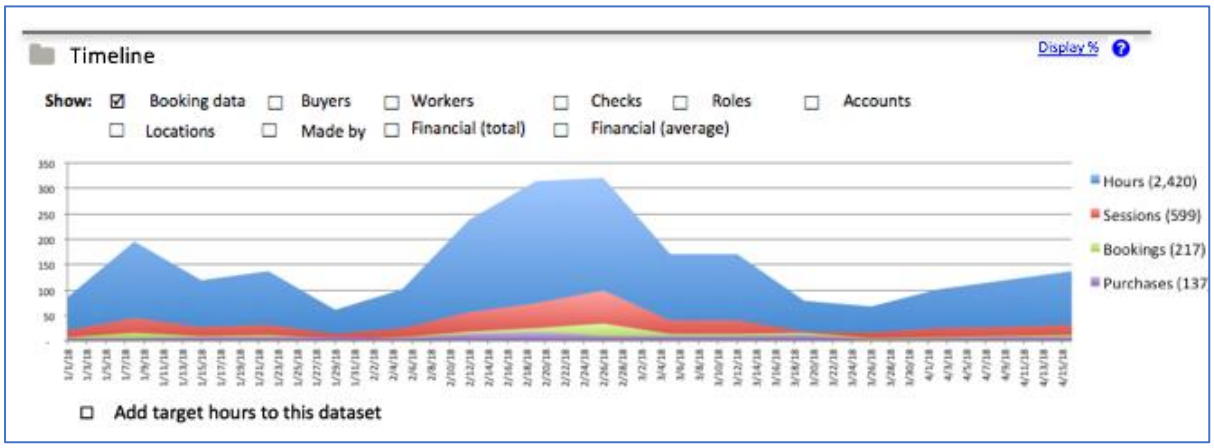
c) Fields

A TL record comprises these fields:

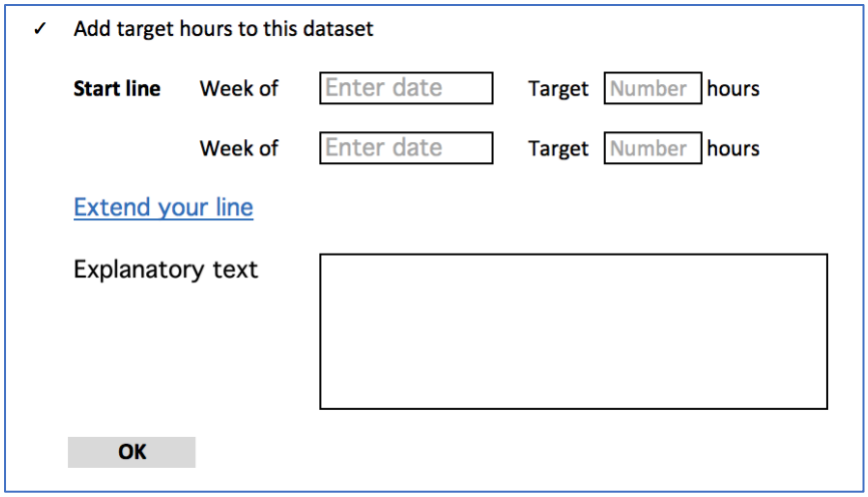
Field		Explanation
1.	Relevant Dataset	This comprises: o Level of access (eg a named Agency's data) o Search fields input to create the Analytics outputs but excluding the date range which is input separately for the TL
2.	Date ranges	The specific weeks in which the line starts, pivots or ends.
3.	Target hours	The amount of hours stipulated at start, end or any pivot points between.
4.	Explanatory text	An explanation of the line: short freetext paragraph.
5.	Edited	Date/time the TL was last changed
6.	Edited by	User who made the edit above

d) Inputs

The possibility of creating a TL is offered to an eligible user every time they are looking at a Timeline Graph in "Booking data" mode where there is not already a TL in place. Initiation is through a tickbox below the graph:

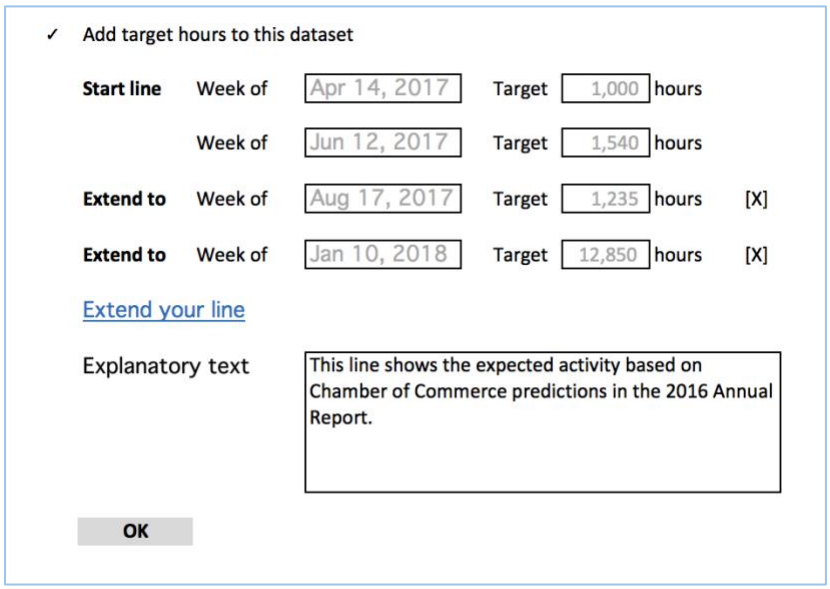


Ticking the box opens an expander within the expander (or a pop-up, whichever is easier for developers):



As a first start/end date and target hours are entered the “Extend your line” option becomes live. This brings up a new end date with target inputs plus the possibility of further extension. Thus, the user is able to define a series of up and down pivots in their line as time progresses. Each additional pivot can be deleted.

They can also enter text. On completion the inputs might look like this:



Clicking OK triggers validation: dates must be progressive. The Activity Graph then reloads displaying the TL.

e) Outputs

Any user looking at the selected dataset for any part of the TL's date range now sees the TL. It has been constructed to rise/fall evenly from the start date between any number of pivots to the end date. Ideally, there is some rounding to produce a flowing layout. (The TL may only cover part of their date range. For example: user may be looking at 12 month period but TL ends in Month 8. It simply stops the appropriate point in the graph in these instances.)

Below the key to the area chart of bookings data is a representative section of the line labelled "Target hours". This is a link that brings up a pop-up containing:

- The explanatory text for that TL.
- A link saying "Hide target hours". Clicking this removes the TL from display. (But the TL reloads every time the graph reloads.)
- At the end, gray text saying: "Targets last edited by [NAME OF USER] on [DATE/TIME]".

Once a TL is in place, any user permitted to enter a TL for this dataset sees a link "Edit target hours" where the "Add target hours" tickbox would normally be. Clicking it re-opens the screen directly above with all inputs. Any can be overwritten. There is also an "End target" link. This disables the TL, recording today's date as its end. This termination of a TL involves:

- Deleting any pivots (line extensions) in the future
- Resetting the end date to today

Helptext

The expander, or pop-up, engaged from the "Target hours" link has our standard helptext icon top right. It brings up this text:

> The "Target hours" facility offers a way to display expectations of market activity over time.
>
> This can help with planning for future peaks in demand, or monitoring commitments from [BUYER]s.

f) Monitoring

We have to allow any user who can create TL's to see all TL's currently in force on datasets they are permitted to view. This requires a new screen called "Target hours" (ICON-FA-LINE-GRAPH). The tab sits at the bottom of the Controls menu for BO users and Agency/Buyer superusers. Ideally this link would not appear until the user has a first TL he is qualified to view.

The screen comprises a table with these columns:

1 Target found

		Level		Start	End	Text	Last edited	Last edit by
[X] CRITERIA	[X] TARGETS	Agency	Walcare Ltd.	Apr 14, 2017	Jan 10, 2018	This line shows the expected ac...	May 7, 2017	Sally Jones

Notes on buttons/columns:

- CRITERIA: brings up the input page used to define the dataset with all the relevant inputs populated. For example, if the dataset is a list of 10 named Sellers working within 1 mile of zipcode 90210: agencySellerReport loads with the ten Sellers' names entered as they were in the original screen and the zip details clear. User can click the bottom of screen button to proceed if they wish.
- TARGETS: Brings up the same screen as above but with the Analytics expander open and the TL immediately visible. Ideally the screen would open with the Timeline Graph at the top of the user's screen. Ideally we would show the area chart data under the TL. User can edit the line at this point.
- Level: This is one of:
  - System
  - Pool
  - Agency
  - Buyer

  It defines to whom the dataset pertains. There is then the name of the entity (blank if the level is "System").

General notes:

- Rows are ordered by most recent "Last edited" date first.
- There is no status for TL's, even those with an end date are displayed in this table.

Helptext

As with all our pages, there is a helptext icon top right of the screen. It pops-up this text:

> The “Target hours” facility offers a way to display expectations of market activity over time.
>
> To enter targets for any particular activity in this market, use reporting screens to find the data for which targets are to be set. (For example: search on the “Bookings report” for all bookings of roofers in a ten mile radius of your office.)
>
> After your search is processed you will be offered a link labelled “Show analytics”. Open this. The “Add target hours” input is at the bottom of the Timeline section when it is displaying “Booking data”.
>
> You can change or remove targets for any particular dataset by clicking “Targets” in the appropriate row in this screen.