Urban Kitchen

A B2B Startup in Restaurant Industry

With

A Restaurant Management Portal

UK Urban Kitchen

9: 09 PM

ABOUT

Urban Kitchen is a B2B startup in restaurant industry that helps restaurant owners/managers to manage staff and customers and analyze their business performance developing management portals and analytical dashboards

PROBLEM STATEMENT

Urban Kitchen is building a software to help restaurant managers/owners to optimize the bandwidth of the waiting staff through table management portal and analyze their business performance through analytical dashboards.
Have to come up with
- Logic for assigning staff in real time to the tables
- Wireframes for table management portals and analytics dashboards
- Monetisation model for developed product

GOALS

- Suggest a suitable algorithm of assigning Y waiters to X tables
- Provide performance metrics of their staff, customers and business and visualize through graphs and charts
- Revenue model for UK's product

WHY MANAGEMENT PORTAL?

CUSTOMER PAINPOINTS

- Restaurant managers(RMs) manage their staff, maintain customer satisfaction and keep track of thousand others at a time to run a successful restaurant, and end up unanswering 'How my business is doing?'
- ROs also unable know the staff performance in the whole month/year
- Unable to decide what to improve to increase the revenue, optimize waiting staff, cutdown expenses, etc.

CUSTOMER NEEDS

- A software which automatically assigns a filled customer table to one of the waiting staff
- Creating and calculating KPIs affecting revenue
- An analysis measuring staff performance and customer satisfaction

UK SOLUTIONS

- ✔ A table management portal that automatically assigns a waiter to a customer filled table
- ✔ Time per table turnaround calculator(a KPI for revenue and customer satisfaction)
- ✔ Analytics of sales and expenses data, feedback of customer satisfaction, staff performance, effectiveness of menu items/specials

ASSIGNING X TABLES TO Y WAITERS (KM$_B$ Algorithm)

At any given point of time, 'p' tables are occupied 'q' waiters are assigned, then (X-p) tables are remained, (Y-q) waiters are remained, then in real time 'm' tables to be assigned to 'n' waiters(where m = X-p; n = Y-q)

PREPARATION STAGE

1. ### Table Range Vector (L):

   A vector representing minimum number of waiters required for each table

$$L \square [1\ 2\ 1\ 3\ \ldots\ldots\ldots\ 2]_{1xn}$$

2. ### Ability Limit Vector (L^a):

   A vector representing maximum number of tables that can be handled by a single waiter

$$L^a \square [2\ 1\ 3\ 1\ \ldots\ldots\ 1]_{1xm}$$

3. ### Performance Matrix (Q):

- A matrix where each element represents performance of a waiter of that table.
- The value is calculated using linear combination of number of times a table served, a score of efficiency handling a small or big table.
- An elemental value is (1 – value derived), since algorithm runs as minimum effective matching

$$Q_{mxn} = \begin{array}{c} \\ 12 \\ \cdots \\ \cdots \\ m \end{array} \begin{bmatrix} 1 & 2 & \cdots\cdots & n \\ 0.82 & & & \\ 0.26 & \cdots & & 0.61 \\ \vdots & \ddots & & \vdots \\ 0.56 & \cdots & & 0.73 \end{bmatrix}$$

4. ### Expanded Matrix (M):

   Expand 'Q' matrix into K x K matrix where waiter's vector has 'L^a' number of rows and table's vector has 'L' number of columns (Fill zeros for new columns of M, such that M is a K x K matrix)

*Assuming (m > n)
And k = m (in this case)

$$M_{kxk} = \begin{array}{c} \\ 12 \\ \cdots \\ \cdots k \end{array} \begin{bmatrix} 1 & 2 & & k \\ 0.82 & \cdots\cdots\cdots\cdots & \\ 0.26 & \cdots & 0.61 \\ \vdots & \ddots & \vdots \\ 0.56 & \cdots & 0.73 \end{bmatrix}$$

Processing Stage(Logic) :

Find the smallest element and subtract it from every element in its row and also find smallest element in every column and subtract it from other element

↓

Initial Stars: find a zero (Z) in M. If there is no starred zero in its row or column, star Z, and adjust zeros to be unavailable, which belong to the same agent but in different rows or columns.

↓

Starred zero in row containing primed zero?

Cover each column containing a starred zero

All covered?

↓ Not covered?

Prime some uncovered zeros: find an uncovered zero and prime it, and adjust zeros to be unavailable, which belong to the same agent but in different rows or columns (starred zeros are excluded)

Until no uncovered zeros are left

Until no starred zero in row containing primed zero

Cover this row and uncover column containing the starred zero

Construct a series of alternating primed and starred zeros as follows

Z_0	Z_1	Z_2
Uncovered prime zero	Starred zero in column of Z_0	Primed zero in row of Z_1(there will be always one)

- Unstar each starred zero of the series, star each primed zero of the series, erase all primes, and uncover every line in M
- Backtracking: adjust unavailable elements to be available according to the erased starred and primed zeros in M

No uncovered zeroes left ?

Save smallest uncovered value

Without altering any stars, primes, or covered lines

Add the value found in Step 4 to every element of each covered row, and subtract it from every element of each uncovered column

The required assignments are indicated by the positions of the starred zeros in M. If M[i, j] is a starred zero, then the element associated with row is assigned to the element associated with column j. (End of KMB)
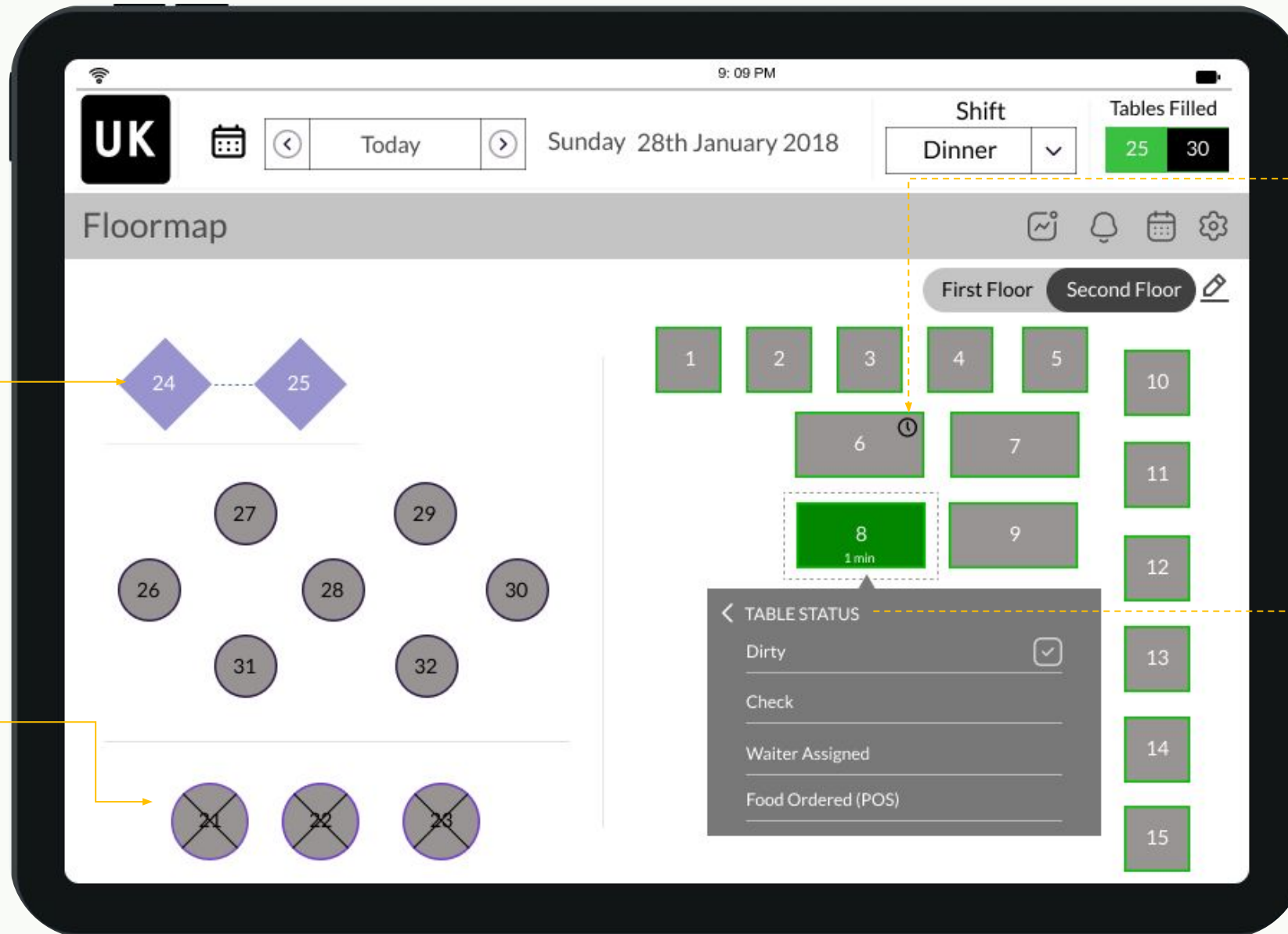
TABLE MANAGEMENT PORTAL

Merge Tables
Merge multiple tables together for large parties. Move seated parties between tables as needed, without losing party information

Block Tables
Block tables off for special events, or let the rest of the team know they have been reserved

Table Timer
This one calculates our required Time per Table Turnaround

Table Status Indicator
This can be used to track table state(check dropped, waiter assigned, needs to be cleared, etc.)

Floormap (on device)

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Today

Sunday 28th January 2018

Shift: Dinner

Tables Filled: 25 / 30

First Floor | Second Floor

Tables: 1, 2, 3, 4, 5, 6, 7, 8 (1 min), 9, 10, 11, 12, 13, 14, 15

24, 25

27, 29, 26, 28, 30, 31, 32

21, 22, 23

TABLE STATUS

Dirty ✓
Check
Waiter Assigned
Food Ordered (POS)

SALES & EXPENSES DASHBOARD
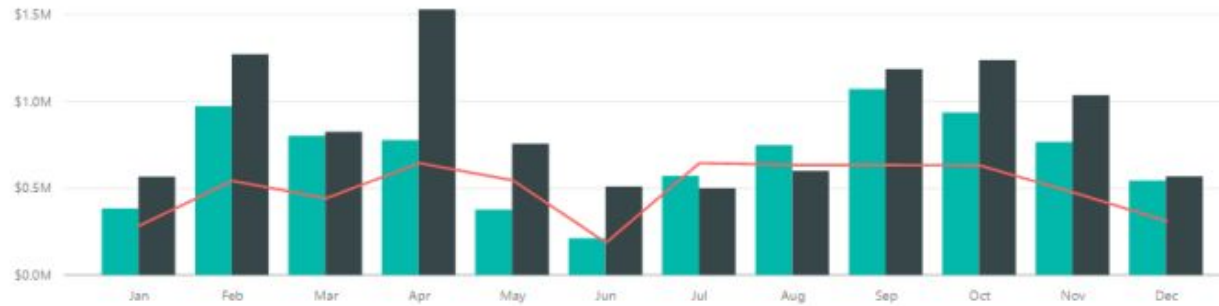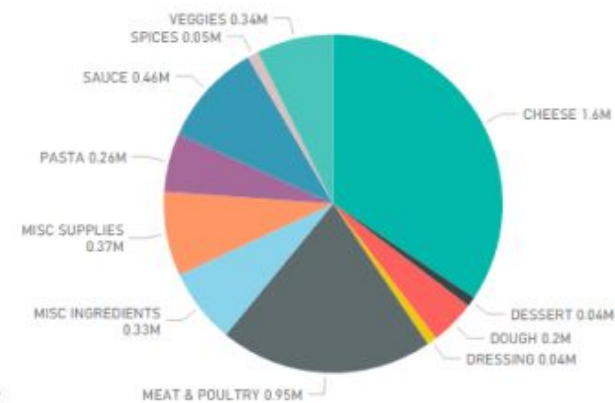
CUSTOMER SERVICE & STAFF PERFORMANCE DASHBOARD

CUSTOMER SERVICE & STAFF PERFORMANCE ANALYSIS

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Net Promoter Score

65

Time per Table Turnaround

26.7 — Avg Daily TPTTA(in mins)

Shift (Dinner) **Lunch**

Shift Wise Analysis

■ Lunch Shift   ■ Dinner Shift

(Horizontal bar chart by day: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday)

Staff Performance

Waiter Name	Number of Tables served (per day)	Avg TPTTA for served table(in mins)	Avg Rating by Customers
Shrey Chaturvedi	4	39.00	7.5
P Govind Rao	13	45.00	8.2
Jyothik	6	38.00	5.9
Abhinav	9	65.00	6.7
Bintu	14	49.00	7.3
Swaroop	4	51.00	8.6
Anmol Rattan	8	33.00	9.2
Rohan	4	67.00	8.1
Prasad	10	38.00	7.7
Ratula Bandyopadhyay	9	63.00	6.9
Sujal Shekhar	10	64.00	8.5
Ramu Valeti	7	64.00	7.4
Vipul Dass	15	40.00	6.9
Amit Solanki	16	33.00	8.8

(Bar chart — Number of waiters vs Range of TPTTA (in mins))

Range of TPTTA (in mins)	Number of waiters
20-30	7
30-40	26
40-50	18
50-60	19
60-70	13

MENU ITEMS & SPECIALS ANALYSIS DASHBOARD

PRODUCT MONETIZATION

A basic price(Rs. X) would be charged for buying a software having table management portal and basic analytics dashboard, editing floor map, etc.

Floor based charges

The extra basic price to be incurred based on number of floors since algorithm, software run time has to be faster since there would be large database and lot many queries would be running behind. Based on that:

If number of floors < 2 ☐ Rs. X
If number of floors >2 ☐   Rs. 1.7X (Based on clear assumption created these numbers)

Extra charges for extra-premium features

Integrating social media channels to analytics
- Providing analysis of restaurant's social media posts, customer's interactions, daily impressions, etc.
- Integrating these features to analytics would help restaurant managers what customers think of their restaurant

Thank you!

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