

## Idea to Innovation: How the San Francisco 49ers Use Real-Time Analytics to Enhance the Fan Experience

**Noele Crooks**

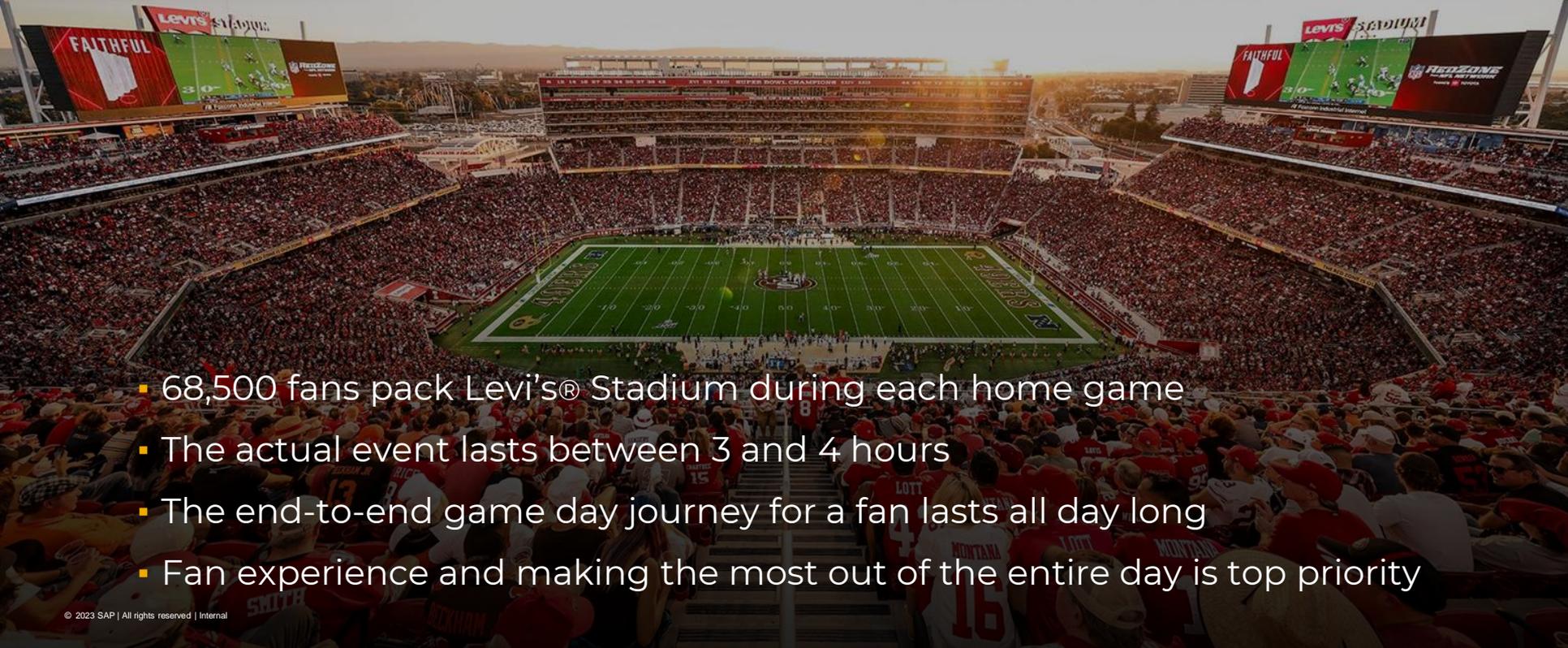
Director, Business Intelligence & CRM  
San Francisco 49ers



Historic franchise NFL team seeks to delight fans throughout their game day journey with an **intelligent venue.**

- San Francisco 49ers
- Operating in Levi's® Stadium
- 70+ years in business
- Multiple Super Bowl championships
- Hosting 68,500 fans on game day





- 68,500 fans pack Levi's® Stadium during each home game
- The actual event lasts between 3 and 4 hours
- The end-to-end game day journey for a fan lasts all day long
- Fan experience and making the most out of the entire day is top priority



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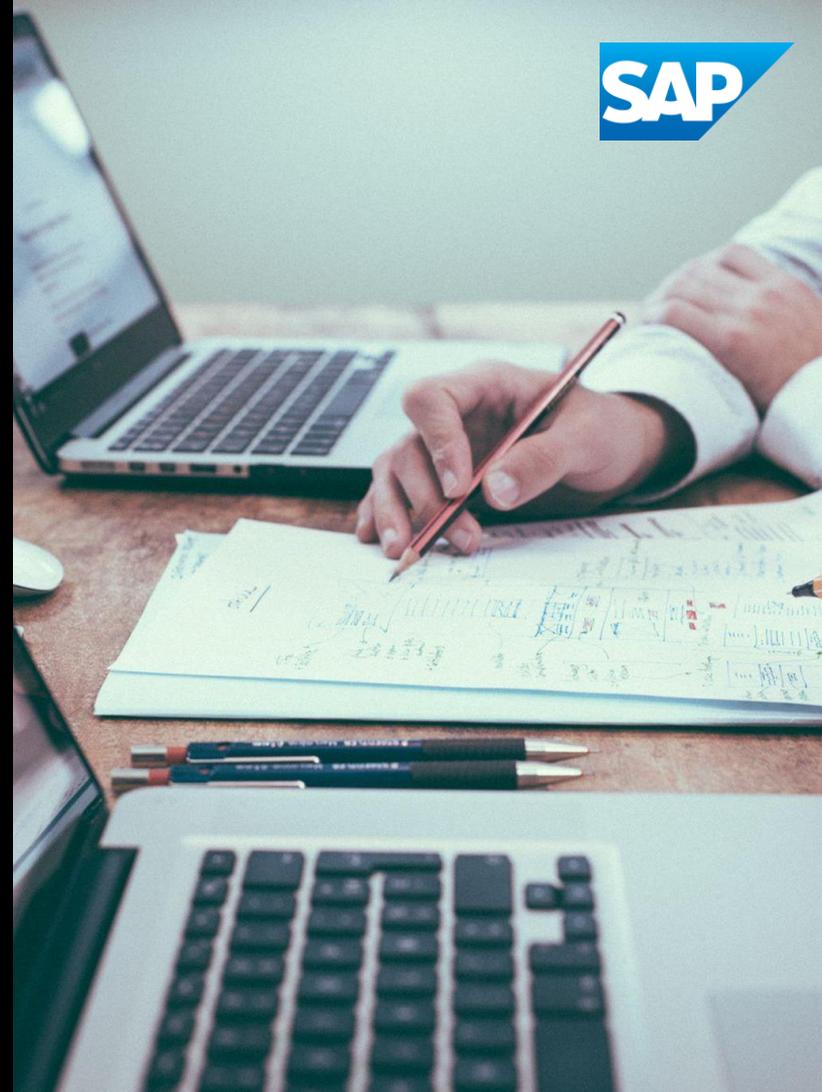
***Our surveys are great...but is there any way to operate in real-time. We only have 10 days a year. If we miss one one game, the best we can do 90%. Are we OK with that?”***

Al Guido  
President  
San Francisco 49ers



The 49ers had no consolidated insights until **3 days after an event.**

With only 10 home games per season, it was incredibly difficult to **iterate and improve** in a way that was impactful to fan experience.





## Life Before SAP BTP

- An existing consolidated data warehouse - Amazon Redshift
- HappyorNot Terminals throughout the stadium; first step into real-time resolution
- Fan surveys issued and analyzed post gameday
- No real-time integration or connectivity



**PLEASE RATE  
THE CLEANLINESS  
OF THIS RESTROOM**



HAPPYORNOT



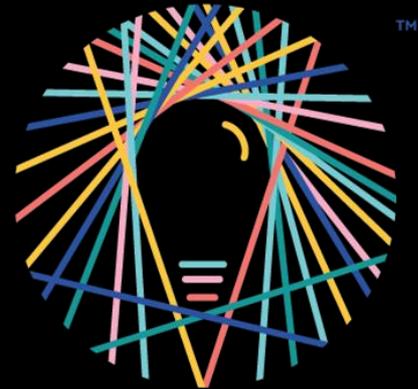
## Action Plan:

- Found a great partner team with SAP
- Headed up the road to SAP Labs in Palo Alto
- Discussed end-to-end game day opportunities
- “Art of the Possible” design approach
- Limitations and technical solutioning were not discussed



## From Idea to Implementation:

- The Executive Huddle was born
- Determined Integration Suite could pull source data
- Confirmed SAP HANA could persist data in real-time
- Addressed cross-database replication with the Data Provisioning Agent
- Began design of dashboards and visualizations



EXECUTIVE  
HUDDLE

Presented by





ticketmaster®

### Attendance

Reference Event (1)  
22GWAS

Comparison Event (1)  
22GKC

### Attendance Scans

TM Event (Ref)1 (1)  
22GWAS

TM Event (Comp)1 (1)  
22GKC

### Pre Paid Parking

TM Event (Ref) (1)  
22PKWAS

TM Event (Comp) (1)  
22PKKC

parkhub

### Transactions

Event (Reference) (1)  
22PKWAS

Event (Comparison) (1)  
22PKKC



### Transactions

Event MIM (Ref) (1)  
22GWAS

Event MIM (Comp) (1)  
22GKC

HAPPYORNOT®

### Responses

Event HON (Ref) (1)  
22GWAS

Event HON (Comp) (1)  
22GKC



### Transactions

Event Fan (REF) (1)  
22GWAS

Event Fan (COMP) (1)  
22GKC



### Readings

Event WAT (Comp) (1)  
22GLAC



### Responses

Event Qual (Ref) (1)  
22GTB

Event Qual (Comp) ...  
22GKC

## Data Acquisition:

Parking to Stadium

- The 49ers do not own any venue-related data
- Acquiring the data was a key component of the Executive Huddle
- Multiple data sources presented unique challenges
- API complexity and data delivery induced creative, **out-of-the-box solutioning**



## The Executive Huddle Build-Out:

- Control room layout perched above the 50-yard line in a converted suite
- A 65" touchscreen, large format interactive monitor + three separate overhanging 55" displays
- SAP Analytics Cloud Storyboards auto-refreshed ceiling mounted monitors
- Parking, attendance, merchandise, concessions, and fan feedback **all displayed live**



HappyOrNot ParkHub Fanatics VenueNext Southern Made

**Inbound**

SMS Messaging

Twilio

**Outbound**

Qualtrics Meter Readers

**Inbound**

Ticketmaster Amazon Redshift Schneider Electric

**Inbound**

Cloud Integration

oData Integration

Smart Data Integration (SDI)

SAP Analytics Cloud

SAP HANA Cloud

**SAP Business Technology Platform**

Smart Data Integration (SDI)

**On-Premise**





# The Executive Huddle: Areas of Focus



Ticket scan by location



Parking scans & capacity



Food & Beverage



Retail & Team Store



HappyOrNot real-time feedback



Notify account reps of arriving VIPs



Mobile ticketing & security



Weather data to predict fan needs



Concessions receipt survey real-time qualitative feedback



Sustainability efforts monitoring water, gas, and electric consumption



# Dashboards: Parking



Refresh (Min)  
1

Reference: SBPK0129  
Comparison: FNPK0409

616% (+11%)  
Capacity  
101,140 (+11%)  
Scan Count

68% (0%)  
Pre-Paid Show Rate  
114,920 (-9%)  
Pre-Paid Sold

49,733  
In Lot Not Entered

40,660 (+11%)  
# Day Of Purchases

78,680 (-9%)  
Pre-Paid Scanned

47,563  
Entered

		Capacity	Capacity Var	Scan Count	Errors	Errors Var
Blue Lot #1	Eligible	842 %	11 %	32,410	1,150	11 %
Green Bus	Non-Eligible	340 %	11 %	340	20	11 %
Green Lot #1	Eligible	757 %	11 %	30,640	10,840	11 %
Green Lot #3	Non-Eligible	668 %	11 %	5,060	260	11 %
Red Lot #1	Eligible	120 %	11 %	5,990	420	11 %
Red Lot #4	(Null)	-	-	6,180	200	11 %
Yellow Lot #1	Non-Eligible	881 %	11 %	15,840	1,720	11 %
Yellow Lot #2	Eligible	560 %	11 %	2,240	140	11 %
Yellow Lot #3	Eligible	528 %	11 %	2,240	80	11 %

## Parking to Stadium



## Lot Group



## Error Types



## Scans by Time







# Dashboards: Concessions

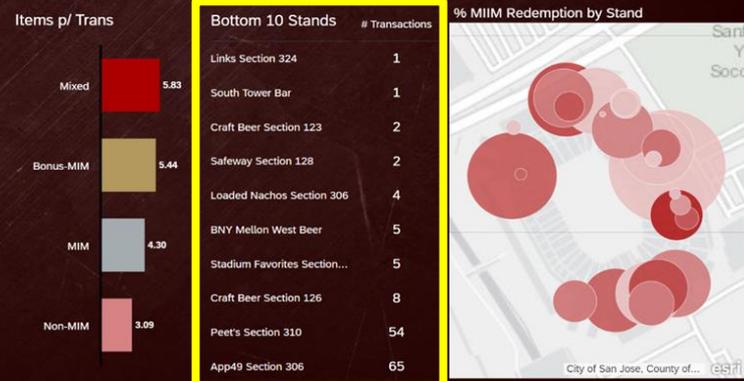


Refresh (Min) 1  
Reference: SBG0129  
Comparison: FNG0409

\$ 386,429 (-48%) Sales	31,986 (-29%) # Transactions	106,152 (-31%) Items
\$ 3.12 (-53%) Revenue Per Cap	15% (+23%) % MIM Transactions	39,043 (-39%) MIM Items
\$ 12.08 (-27%) Revenue Per Trans	4,793 (-13%) # MIM + Mixed Transactions	67,109 (-26%) NON MIM



Rev. Center Name	# Transactions	MIM Items	MIM p/ Trans	Sales (\$)	% MIM Transact...
Tap Room Section 115	1,157	302	0.26	15,547	1 %
Gold Bar Section 145	1,039	16	0.02	18,191	-
Stadium Favorites Section 144	927	3,483	3.76	8,188	48 %
Stadium Favorites Section 105	817	2,897	3.55	5,273	58 %
Candlestick Pub Section 131	139	0.17	14,545	-	-
Blue Line Pizza Section 112	796	399	0.50	9,890	4 %
Starbird Chicken Section 113	785	313	0.40	9,968	2 %
Loaded Nachos Section 124	765	1,414	1.85	8,037	32 %
Smoking Pig Section 107	757	296	0.39	11,970	1 %
Stadium Favorites Section 129	729	2,310	3.17	6,028	47 %
The Organic Coup Section 127	729	564	0.77	12,937	2 %
Links Section 109	694	1,522	2.19	8,529	32 %
Tostitos Section 305	679	2,253	3.32	6,200	37 %
Stadium Favorites Section 126	674	2,298	3.41	4,292	59 %





# Dashboards: Fan Feedback



## Fan Feedback

Reference: SBG0129  
Comparison: FNG0409

Refresh (Min)  
1



63%  
% Very Happy  
112,680  
Very Happy



9%  
% Happy  
15,675  
Happy



4%  
% Sad  
7,740  
Sad



23%  
% Very Sad  
41,490  
Very Sad

71 (0)  
Index  
177,585  
Records



### Bottom 10 Terminals

Level 2 Name (1)  
Concessions

	Index	Change	Records
AMPM-1	86	0	810
BBQ 3107-1	78	0	855
BBQ 3127-1	75	0	630
BBQ 7307-1	76	0	615
Burgers 3118-1	83	0	630
Burgers 7319-1	56	0	915
Burgers/Chicken 7309-1	75	0	855
Burgers/Loaded Tots 3118-1	73	0	1,095
Chicken 3121-1	75	0	960
Chicken/Franks 3122-1	89	0	675

	Index	Change	Records
∨ (all)	71	0	177,585
> Concessions	72	0	41,985
> Guest Services	73	0	5,700
> Restrooms	65	0	34,710
> Retail	78	0	24,510
> Screening	69	0	66,630
> Suites/Clubs	86	0	4,050

MRR 110	20	89	89	67	76	92	66	70	100	92	56	23	27	40	36	38	40	53	56	47	59	72	13	83	0
MRR 127	100	100	83	100	100	50	66	100	100	83	33	66	50	0	89	48	28	50							
MRR 302	78	100	66	33	0	100	50	100	83	87	67	71	81	68	78	57	37	47	50	50	79	67	86		
MRR 311	100							100	67	0	67	86	94	85	61	69	81	95	44	50	57	64	83		
MRR 318	100									33	66			66	33	100			83	67	66	50	65	77	





# Dashboards: Concessions Feedback



Qualtrics

Refresh (Min)

13,823

Total Satisfaction Index Score

63.2 (+28.7)

Total # of Responses

17 (-60%)

Food & Bev. Quality

73.5  
(+24.7)

Food & Bev. Variety

67.6  
(+15.3)

Speed of Service

64.7  
(+29.6)

Concessions Personnel

77.9  
(+17.8)

Scan & Pay (49ers App)

64.7  
(+35.5)

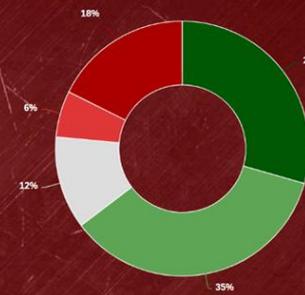
Index Score by Event (Satisfaction)



Survey Count by Overall Satisfaction Rating

How satisfied were you with your Levi's® Stadium Food and Beverage order?

Excellent Good Average Below Average Poor



Food & Beverage Experience

How would you rate your Food & Beverage experience?

Excellent Good Average Below Average Poor

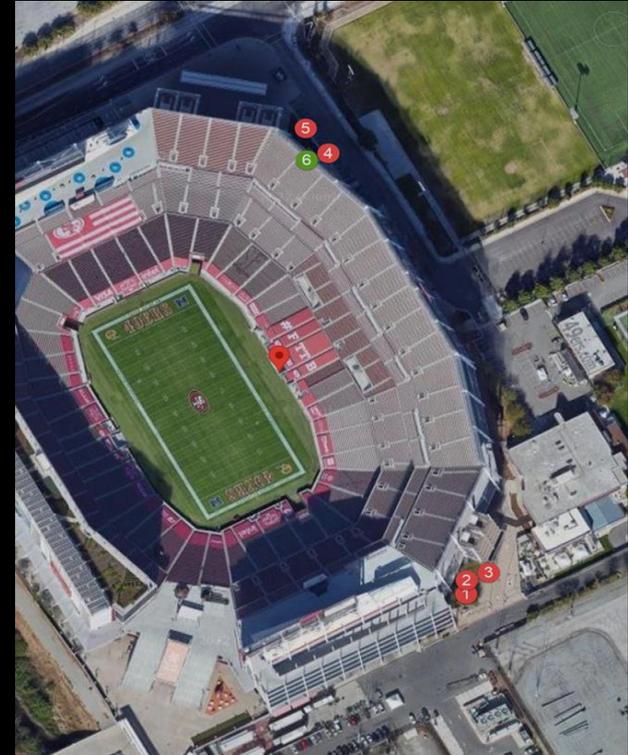


Comments





# Dashboards: Sustainability





# Executive Huddle: Beyond Gameday



DATA ANALYTICS



Find the Ratio of Staff to Fans

Divide both numbers by the smallest total  
 $30,100 \div 25$  and  $25 \div 25$

Get  
1,204 and 1

Now we know there are 1,204 guests  
for every 1 staff member

That amount resulted in a score of 59  
which is well below the target of 80

It will be the same process for each gate:  
Divide both numbers by the staff number  
(lowest)

	# OF FANS	# OF STAFF	RATIO	
GATE A	30,100	25	1,204	59
GATE B	5,270	25		97
GATE C	8,005	25		90
GATE F	25,125	25		65

\*Data are for 49ers EDU purposes only

The Executive Huddle and SAP are integrated into the 49ers EDU Virtual Lesson Series with a dedicated lesson on data science and analytics. In addition, the Virtual Lesson Series brings the Levi's® Stadium field trip experience directly to students where they visit the Executive Huddle in-person.



## The Outcome:

- **First and only Venue Digital Boardroom**  
45 + events supported
- **Optimized fan experience by addressing feedback in real-time**  
<10 minutes or less to solve issues
- **Uncovered opportunities across retail, concessions and stadium operations**  
200+ issues resolved
- **Obtained insights across the fan's game day journey**  
+43% increase in fan satisfaction



## Key Takeaways

- Acquiring data is the “long pole in the tent”
- Iterative development is key
- This use case applies **beyond professional sports**
- An Intelligent Venue can be realized in as little as 3-4 months



## How to Connect with Me

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