

Product Consolidation Analysis and Insights

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Introduction

Welcome to the **Product Consolidation Analysis and Insights** project. This notebook presents a comprehensive analysis aimed at identifying underutilized Qlik and Cognos applications to streamline operations, optimize costs, and improve resource efficiency.

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Objective

The objective of this project is to:

1. **Identify underutilized applications** to determine which apps can be optimized, consolidated, or retired.
 2. **Provide actionable recommendations** using a dashboard for HR leaders and stakeholders.
 3. Lay the groundwork for **ongoing monitoring** and efficient application management.
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Introduction to Role and Team Structure

In my role within the **People Analytics and Insights (PA&I)** team at Verizon, I am part of a branch in HR Operations focused on supporting HR and organizational goals through data-driven insights. The PA&I team is composed of six specialized sub teams, each with a unique focus:

Organizational Mission

Together, these sub teams work toward a shared goal: **to empower HR and business leaders with actionable insights and data driven strategies**, ultimately enhancing employee experience and driving organizational success.

Our team leverages structured data, such as employee records, and unstructured data, like survey feedback, to uncover meaningful trends. My role involves processing, analyzing, and visualizing data to deliver insights that are both accurate and impactful.

We ensure **data security** by following international privacy laws and Verizon's policies, using Workday Security Groups to grant HR access only to relevant data. Our governance standards prioritize privacy, accuracy, and compliance in handling sensitive HR information.

As a Data Analyst, I work on collecting, analyzing, and visualizing data to support HR decision making. By learning new data skills, I aim to enhance my ability to create impactful insights, collaborate more effectively with data engineers and HR leaders, and grow into a domain expert.

Identifying a Business Problem

###Problem Statement

The PA&I team identified inefficiencies stemming from the underutilization of Qlik applications and the continued reliance on legacy Cognos apps. These issues result in **increased operational costs, excessive consumption of compute and memory resources**, and hindered efforts toward **platform standardization**.

To address these challenges, I analyzed structured usage data and unstructured feedback to:

1. Identify underused Qlik apps for potential retirement.
2. Assess Cognos app usage to explore migration opportunities.

As part of the project, I:

- **Cleaned and processed** data to ensure accuracy and usability.
- Built **interactive dashboards** to visualize insights.
- Formulated **actionable recommendations** based on my findings.

Once the analysis was complete, I engaged with stakeholders, including GTS and HR leaders, to validate findings and determine next steps. The goal is to finalize and present these recommendations by the end of the year at the HR analytics meeting for the business group. This initiative aims to **streamline HR applications, reduce costs, save compute and memory resources**, and promote **Qlik adoption as the standard analytics platform**.

###Key Stakeholders

The project benefits my **direct team in PA&I**, as well as various cross functional teams and leaders across the organization. The main stakeholders include:

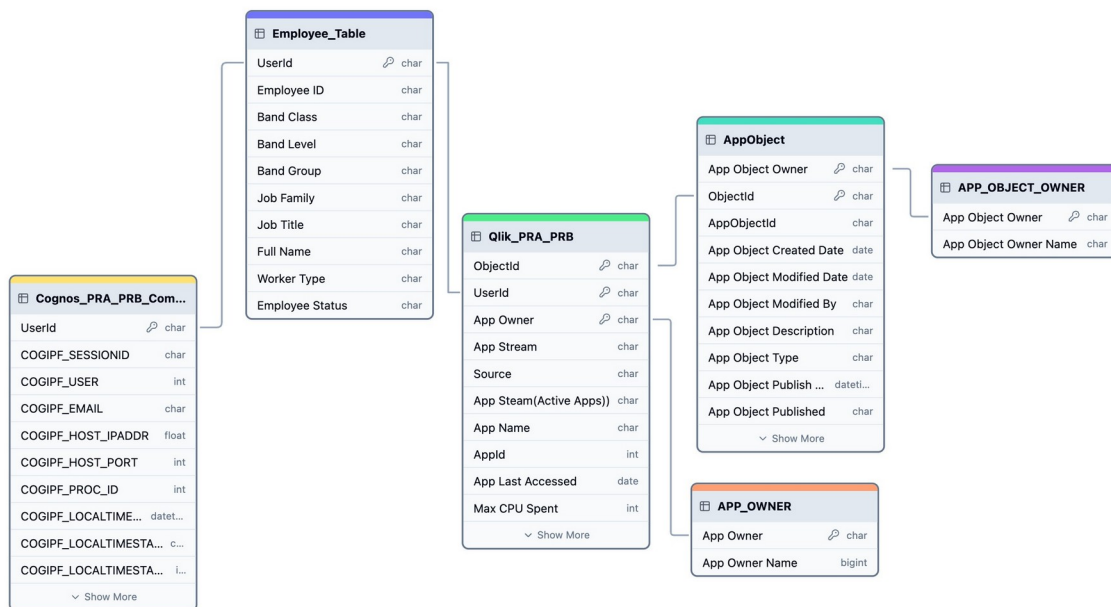
- **Senior Director of PA&I:** Oversees strategic alignment and final approval.

- **Principal Data Engineer:** Builds and manages the **data pipeline** to ensure analysts have the necessary datasets.
- **Senior Project Manager:** Coordinates project timelines and deliverables.
- **Data Analyst:** Responsible for data analysis, dashboard creation, and generating recommendations.

Additionally, the dashboards and insights benefit:

- **Finance and HR teams,** including HRBPs and people leaders.
- **GTS and HRIS teams** responsible for technology and data integration.
- Broader Verizon employees using the applications.

Data Architecture



This project utilizes a relational dataset consisting of several interconnected tables, as shown in the ERD. The tables are linked by the primary key **UserId**, enabling the integration of employee and application usage data for analysis.

The data used in this project follows Verizon’s strict data governance policies, including adherence to international data privacy laws like GDPR. Sensitive employee information, such as job titles and employment status, is securely stored and accessed only by authorized personnel through Workday Security Groups.

The **Employee_Table** contains key employee data such as job titles, worker types, and employment status. This is essential for understanding who interacts with specific applications and for identifying patterns in application usage across different employee groups.

The **Qlik_PRA_PRB** and **Cognos_PRA_PRB_CombineTable** contain application usage data, including user sessions, last accessed dates, and app owners. Together, these tables contain approximately 1.6 million rows and are used to identify underutilized or legacy applications that can be retired or consolidated.

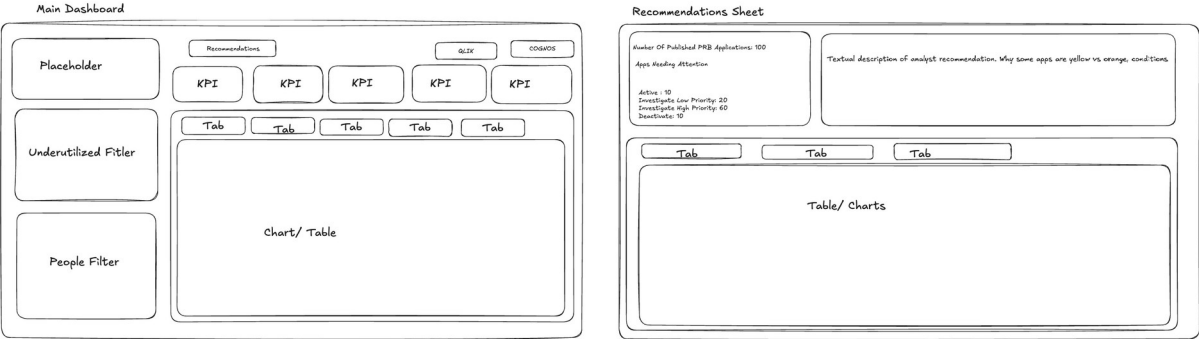
The **AppObject** and **APP_OWNER** tables were introduced to improve performance in Qlik. Previously, all data was stored in a single large table, which resulted in slow processing speeds. By splitting metadata into these separate tables allow faster access to additional details when needed without overloading the system.

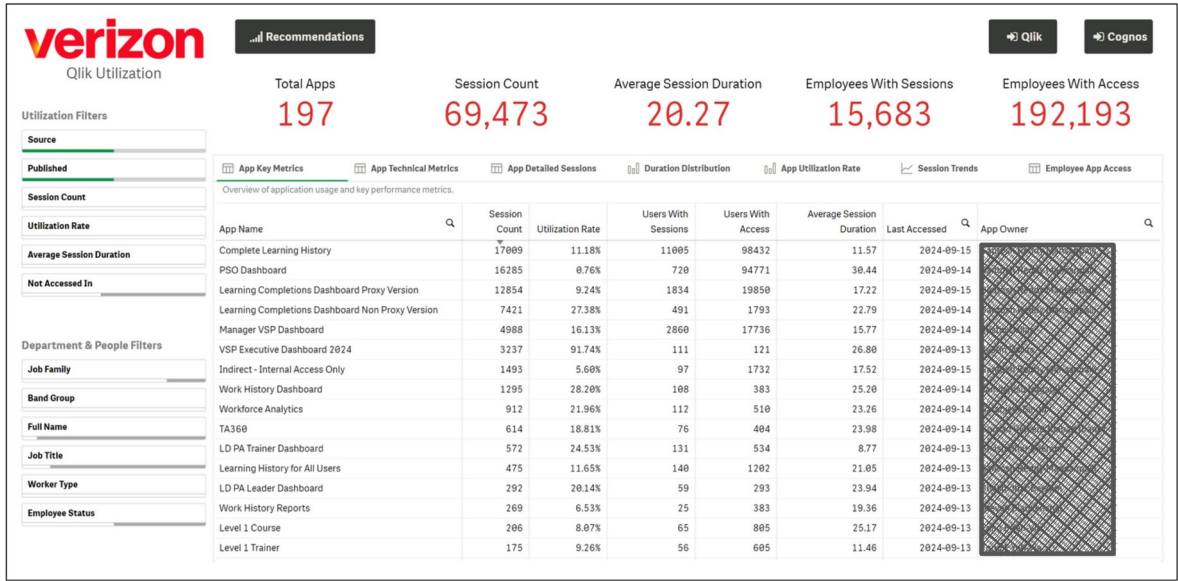
Dashboard Development

The dashboard was designed with a clear focus on **user friendliness** and **familiarity**, ensuring it would be intuitive for HR leaders and team members. Starting from a wireframe, the UI design emphasized simplicity to deliver actionable insights without overwhelming users.

GOALS:
- Find underutilized applications to deactivate or update.

FEATURES:
- dashboard that displays the usage and flag needed appsw/req
- custom filters for analysis
- toggle between Cognos and Qlik
- tabs to drill down and visualization
- analyst recommendation dashboard





Key Features

- **KPIs:**
High level insights with KPIs giving users an overview of application usage and engagement.
- **Filters:**
Interactive filters, help users refine their focus and uncover actionable insights by applying specific criteria.
- **Tabs:**
Organized into intuitive tabs, the dashboard allows users to seamlessly switch from broad overviews to detailed analysis.
- **Navigation Buttons:**
Buttons at the top of the dashboard enable users to navigate between **Qlik**, **Cognos**, and **Recommendations** sheets.

Data Analysis

Data Quality

For this project, I worked closely with a **data engineer** to address data challenges and ensure it was ready for analysis. While I didn't directly clean the data, I relied on Qlik to manage inconsistencies and extract insights effectively.

Some notable challenges included:

- **Missing or null values:** These varied based on session outcomes and employee types. For example, the original dataset only captured employees with access to applications,

not those actively using them. Working with my data engineer, we added a column to track employees with sessions.

- **Total session count discrepancies:** Initially, the session count data was incomplete, but additional data points were incorporated to improve accuracy.

Another key challenge was the **inconsistent naming conventions**. Due to how the data was preloaded into Qlik's Data Load Editor, I couldn't standardize the naming. Qlik provides flexible syntax to access variables with spaces or unusual formats, which allowed me to work despite these inconsistencies. However, if I were to redo the process, I would adopt a **consistent naming convention**:

- Use **SCREAMING_SNAKE_CASE** for table names (e.g., APP_OBJECT).
- Use **snake_case** for column headers (e.g., app_last_accessed).

Session Duration

For applications in the published PRB environment, the **total** session duration amounts to **1.41 million minutes**, with an **average** session duration of **20 minutes**.

To calculate these metrics, I aggregated the data at the app level. Each row in the dataset represents an individual session, meaning app names and user IDs often repeat. By grouping the data by distinct **AppId**, I was able to compute the average session duration for each app.

Why Session Duration Matters

- **User Engagement:** Longer durations indicate deeper interaction, while shorter durations might point to inefficiencies or low relevance.
- **Optimization Opportunities:** Apps with extremely long or short durations can reveal potential usability issues or inefficiencies that need to be addressed.

To further simplify the analysis, I categorized session durations into **buckets**:

- **Simplified Insights:** Grouping session durations into categories makes the data easier to interpret.
- **Actionable Data:** Identifying apps with shorter durations highlights underperforming applications and helps prioritize improvements.

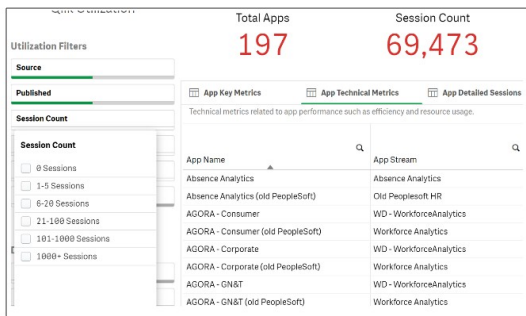
Session Count

Session count measures the frequency of application usage, offering insights into engagement. For applications in the published PRB environment, the **total** session count is **69,473**, with individual app session counts **ranging** from **0** to approximately **17,000**.

To calculate these metrics, I grouped the data by distinct **AppId** and used **Count(Distinct SessionID)** to determine the total number of unique sessions for each app.

Importance of Session Count

- **Performance Evaluation:** It quantifies application demand and identifies crucial apps.
- **Cost Efficiency:** Underperforming apps with low session counts can be optimized or retired, saving resources.
- **Strategic Insights:** Trends and patterns in session counts guide data driven decisions for better application management.



```

Edit expression
1 =Dual(
2   IF(Aggr(Avg([Session Duration]), [AppId]) < 1, 'Under 1 Minute',
3   IF(Aggr(Avg([Session Duration]), [AppId]) <= 5, '1-5 Minutes',
4   IF(Aggr(Avg([Session Duration]), [AppId]) <= 10, '5-10 Minutes',
5   IF(Aggr(Avg([Session Duration]), [AppId]) <= 20, '10-20 Minutes',
6   '20+ Minutes'))),
7
8   IF(Aggr(Avg([Session Duration]), [AppId]) < 1, 1,
9   IF(Aggr(Avg([Session Duration]), [AppId]) <= 5, 2,
10  IF(Aggr(Avg([Session Duration]), [AppId]) <= 10, 3,
11  IF(Aggr(Avg([Session Duration]), [AppId]) <= 20, 4, 5))))
12 )
  
```

Employee_Table		Employee_Table									
Rows	Fields	Userid	Employee ID	Band Class	Band Level	Band Group	Job Family	Job Title	Full Name	Worker Type	Employee Status
6057188	19									Extended Learner	T
Keys	1									Extended Learner	T
Tags	Skey Sascii Stext									Extended Learner	T
										Extended Learner	T
										Extended Learner	T
										Extended Learner	T
										Extended Learner	T
										Extended Learner	T

Data-Driven Visualizations

Tailoring Analysis

When evaluating underutilized apps, it became clear that **no single rule can define underutilization**. Usage patterns and importance vary widely. For example, some apps are built for a single user, while others are used quarterly or periodically for reports. These nuances make blanket rules impractical.

To address this, I focused on identifying **outliers** using multiple filters:

- Apps with **session durations under one minute**, which could indicate inefficiencies or lack of engagement.
- Apps with **no active users** or extended inactivity, flagged for potential review.
- Combined filters to highlight apps with multiple red flags.

By combining these flags with a deeper understanding of each app's purpose and usage, I was able to identify applications that needed further investigation. This allowed stakeholders to make thoughtful decisions about whether to retain, optimize, or retire specific apps.

Data Tables

Tables are a core component of the dashboard. Since the project's main goal is to identify underutilized applications for investigation or deactivation, tables provide a clear way to display actionable insights. Their simplicity and clarity ensure stakeholders can make quick, informed decisions without unnecessary complexity.

Recommendations Sheet

This provides a focused view of all applications, categorized into four distinct statuses: **Green**, **Yellow**, **Orange**, and **Red**. The table is designed to help users quickly identify applications that need immediate attention or further investigation. The filter pane allows users to narrow the view by status so they can focus on specific categories.

The Recommendations Table categorizes 196 applications into the following statuses:

- **Green (43 apps):** Active apps with sufficient usage requiring no action.
- **Yellow (7 apps):** Apps with low engagement, such as session counts under 10 or short durations, which may warrant monitoring.
- **Orange (120 apps):** Apps with usage concerns, such as session durations under a minute or low session counts, flagged for closer review.
- **Red (26 apps):** Apps with zero user access, recommended for deactivation.

These classifications provide a high level overview of app health. For more detailed insights, users can return to the main dashboard to analyze individual sessions, users, and broader application usage trends.

Home

Total Published PRB Apps

196

- Red 26
- Orange 120
- Yellow 7
- Green 43

Red Apps (To Be Deactivated): Apps with zero user access, indicating they're no longer needed and are set for deactivation.

Orange Apps (Major Concern): Apps with usage issues, such as session durations under a minute, session counts below five, or zero sessions despite users having access.

Yellow Apps (Minor Concern): Apps with low engagement, including session counts under ten or session durations under five minutes, which may warrant monitoring.

Green Apps (Healthy): Active apps with sufficient usage; no action required.

App Name	Recom...	Reason	Session Count	Utilization Rate	Users With Sessions	Users With Access	Session Duration	Last Access...	App Owner
AGORA - Consumer	Green		11	0.78%	4	510	33.15	8/21/2024	
WPA All Cases Report Wireless	Green		9	1.35%	1	74	7.03	9/5/2024	
AGORA - International	Yellow	Session count < 10	8	0.59%	3	510	28.92	8/8/2024	
AGORA - VBG	Orange	Session duration < 1 min, session count < 10	8	0.98%	5	510	0.89	8/29/2024	
Learning Completions Leadership	Green		8	0.09%	17	19408	1.03	9/10/2024	
WorkForce Analytics (old PeopleSoft)	Green		8	1.64%	6	366	11.38	9/4/2024	
Level 1 Content Manager	Yellow	Session duration < 5 mins	7	2.39%	7	293	27.50	8/5/2024	
Verizon Workforce Management Dashboard	Yellow	Session count < 10	7	12.00%	3	25	35.63	9/13/2024	
AGORA - GN&T	Yellow	Session count < 10	6	0.78%	4	510	24.17	9/4/2024	
Severance - Management Business Case	Yellow	Session count < 10	5	0.34%	5	1485	27.71	8/14/2024	
AGORA - Corporate	Orange	Session count < 5	4	0.39%	2	510	4.88	9/4/2024	
AGORA - Corporate (old PeopleSoft)	Orange	Session count < 5	4	0.82%	3	366	10.31	8/7/2024	
GWA - VAST Applications (Requesters)	Orange	Session duration < 5 mins, session count < 5	4	0.27%	3	1102	20.09	9/2/2024	

App Technical Metrics Table

This table provides detailed technical information for each application, such as **file size**, **publish** and **modified dates**, and **CPU usage** (both maximum and average). Users can drill down into this table to focus on specific apps and evaluate their efficiency and resource demands. This table supports informed decisions about whether an app's performance justifies its continued use.

App Name	App Stream	App Publish...	App Publish Date	App Modified Date	App File Size	Max CPU Spent (ms)	Avg CPU Spent (ms)	App Cost Session Count
Workforce Analytics	WD - WorkforceAnalytics	True	9/13/2024	9/15/2024	2231898	2,107,313	124,759.72	500+

App Detail Sessions Table

This table is designed to support targeted investigations by providing a granular view of session level data. Users can drill down into specific applications to see which employees accessed them, their session durations, and usage patterns. This information is especially useful for identifying niche apps and understanding user engagement. The **primary purpose** of this table is to enable stakeholders to reach out to specific users during the investigation process, ensuring informed decisions about application optimization or retirement.

Full Name	Status	Band Class	Job Family	Job Title	Session Duration	Last Accessed
	Active	Salaried Management (7/ D)	Benefits	Cslt-Benefits	5.72	2024-08-16 16:20:49
	Active	Salaried Management (7/ D)	Benefits	Cslt-Benefits	11.78	2024-08-20 14:19:38
	Active	Salaried Management (7/ D)	Benefits	Cslt-Benefits	45.54	2024-08-16 13:06:47
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	0.18	2024-08-20 13:27:37
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	0.44	2024-08-20 13:29:25
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	11.14	2024-08-20 17:07:28
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	34.54	2024-08-20 14:03:59
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	1.40	2024-08-27 15:40:29
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	5.58	2024-08-15 17:00:22
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	13.20	2024-08-15 11:35:55
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	30.86	2024-08-26 17:54:03
	Active	Manager (6/C)	Business Analytics	Assoc Dir-Business Intelligence	33.96	2024-08-15 12:20:33
	Active	Manaoer (6/C)	Business Analytics	Business Intelligence-Sr Mar	6.18	2024-08-26 09:55:51

Session Trends

The Session Trends visualization offers a dynamic way for users to monitor application usage patterns over time. In the example shown, the graph displays session trends across all **25 Cognos packages**, with no filters applied. This overview highlights when usage peaks, such as the spike in July 2024, and provides insights into broader patterns of engagement.

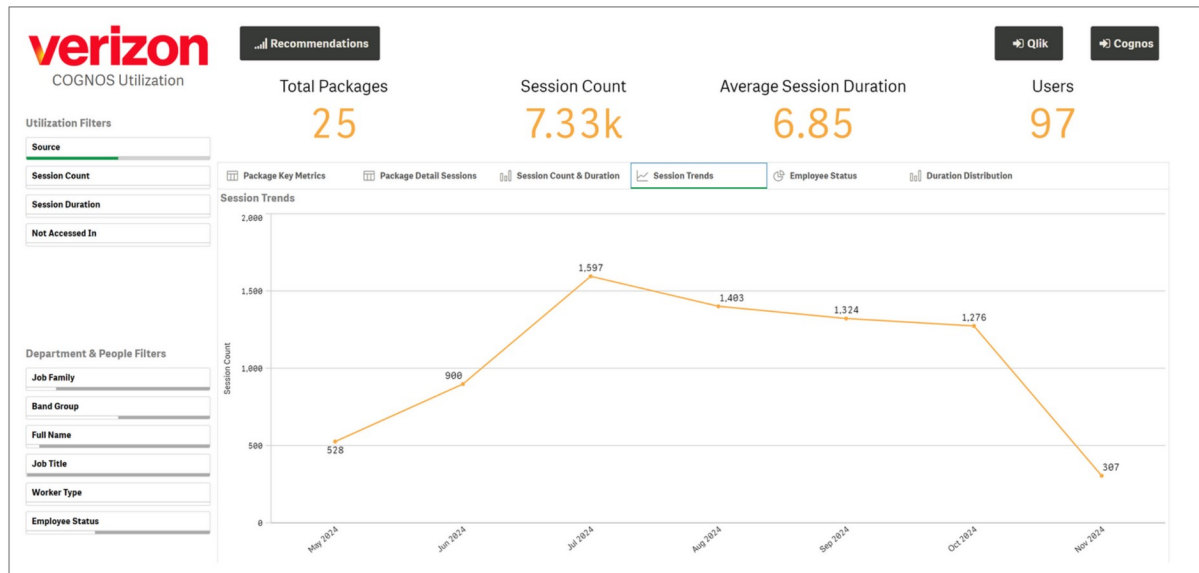
Key Features

- **Drill-Down Capability:** Users can filter by specific apps or packages to analyze their session trends, tracking usage fluctuations for individual or grouped applications.
- **Interactive Filters:** Filters like **job family**, **worker type**, or **session duration** enable users to explore trends for specific user groups or scenarios.
- **Actionable Insights:** Peaks and dips highlight periods of high demand or inactivity, helping identify apps needing further support or investigation.

For the **Qlik Utilization dashboard**, a similar session trends visualization is implemented, offering the same functionality. This unified approach ensures consistency across platforms and allows HR leaders to analyze trends comprehensively.

Why It Matters

Understanding session trends provides critical insights into the **timing of application usage** and helps identify seasonal or situational patterns. This information is instrumental for **resource allocation**, optimizing app performance, and deciding which apps require further investigation or support.



Duration Distribution

This horizontal bar chart visualizes the distribution of session durations across defined time buckets. Each bar represents a **duration category**, ranging from **0-1 minute** to **2+ hours**, showing the total session count for each.

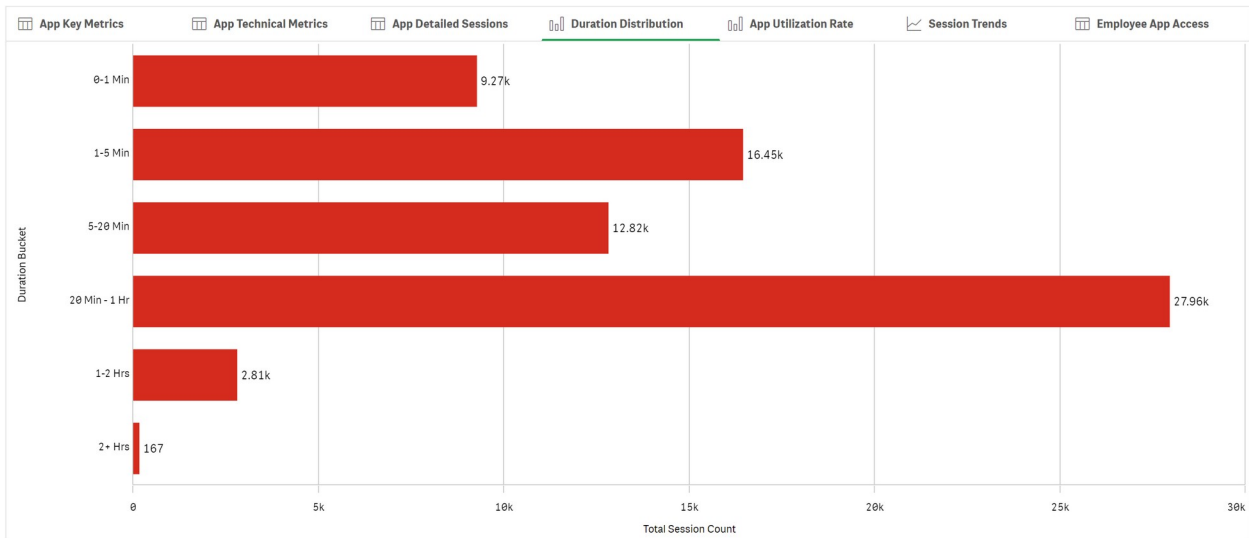
Why Duration Distribution Matters:

- **Quick Overview:** The chart provides a clear view of how users interact with applications, emphasizing the most common session durations. For example, the **20-minute to 1-hour bucket** has the highest activity with **27.96k sessions**, while the **2+ hour bucket** has minimal usage at just **167 sessions**.
- **Actionable Insights:** Buckets with shorter durations, such as the **0-1 minute** category (**9.27k sessions**), may indicate inefficiencies or low engagement, signaling apps that need investigation or optimization.
- **Trend Analysis:** Understanding session duration patterns helps stakeholders identify outliers or opportunities to improve app usability and relevance.

Interactivity:

Users can apply filters to narrow down the analysis to specific applications, user groups, or timeframes. This allows for a **customized view** of session durations, giving actionable insights for diverse scenarios.

This visualization complements the session trends chart, offering another perspective on user engagement by focusing on how long applications are utilized during each session.



Why Tailored Analysis Matters

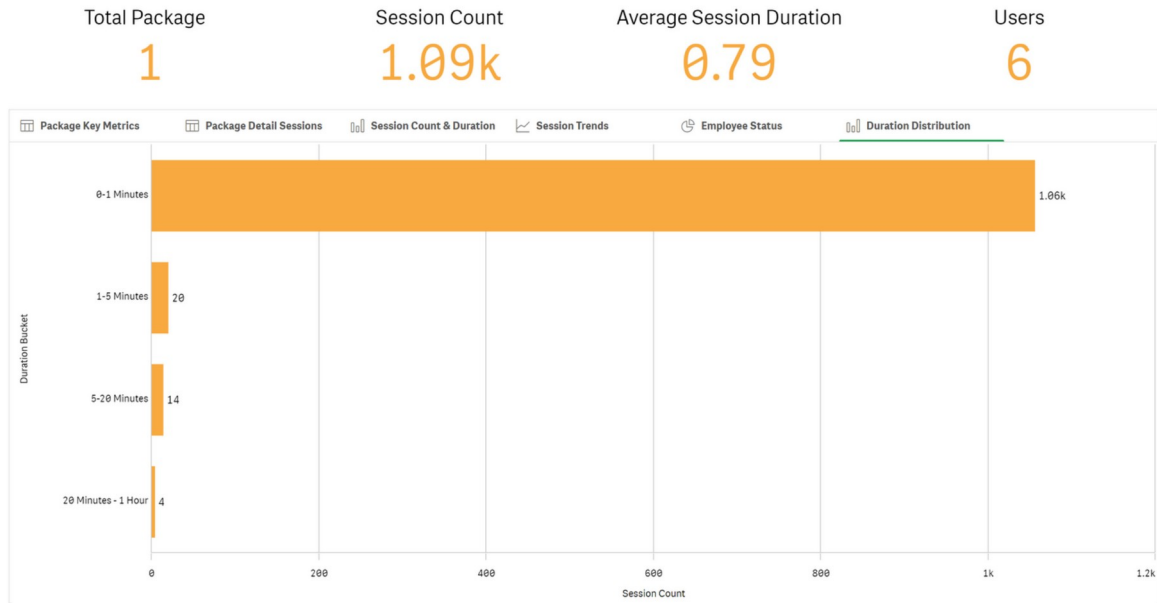
An example from a **Cognos package** highlights this need. The **average session duration** is only **0.79 minutes**, but this low figure is caused by how Cognos creates automatic sessions. The true engagement lies within the longer sessions, which represent actual user interaction.

Insights from the Chart:

- **Short Sessions:** The majority of sessions (1.06k) fall within the **0-1 minute** bucket, reflecting automatic activity or brief interactions.
- **Meaningful Usage:** Longer duration buckets, while smaller in count, represent actual user engagement and are more relevant for understanding app performance.

Actionable Insights:

This tailored approach ensures that applications with unique usage patterns, like this Cognos package, are not prematurely flagged for deactivation. Instead, meaningful metrics like session durations over **5 minutes** can guide decisions to optimize or retain such apps.



Measuring Impact

Current Progress

At this stage, we're in the **deployment phase**, with a focus on preparing the application for production. I am currently **cleaning up** variables and queries within the dashboard to enhance efficiency and usability. Meanwhile, the data engineer is integrating **updated data** to ensure recommendations are both accurate and timely. Progress is also being made to move the application into the **production environment**, where it will be accessible to HR leaders and other stakeholders.

Although this project is in its deployment phase, **measurable outcomes are anticipated shortly**.

We have already identified apps that should be deactivated and those that require further review. The next step involves investigating flagged apps, contacting relevant users, and gathering additional information to validate and finalize recommendations.

Anticipated Impact

This is the **first time the PA&I team has implemented a project like this**, so while ramping up takes time, the long term benefits will be significant. Once the initial consolidation is finished, this will become an ongoing process that will streamline app management and create lasting value for the team.

Some key anticipated benefits include:

- **Time Savings:** The dashboard enables the team to easily identify apps for deactivation or investigation, making the process faster and more efficient compared to past methods.

- **Cost Optimization:** The **App Technical Metrics** section provides visibility into compute usage, helping the team estimate costs associated with maintaining these applications and identifying opportunities for optimization.

Future Goals

As the **execution phase** wraps up:

- Deactivating flagged apps will **reduce costs** and free up valuable compute and memory resources.
- Investigations will provide insights into user needs, ensuring apps align better with business goals.
- The dashboard will remain a key tool, helping the team manage applications more effectively and reliably over time.

While the full impact won't be clear until the execution phase is complete, this project is already laying the groundwork for long term improvements in efficiency, cost savings, and decision making.