HOW TO CHOOSE

A PUSH-TO-TALK APPLICATION

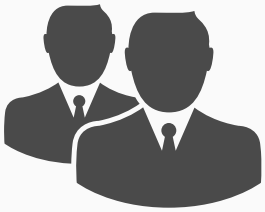
THAT IS MORE THAN A REPLACEMENT FOR TWO-WAY RADIO COMMUNICATION

WHO SHOULD READ THIS?

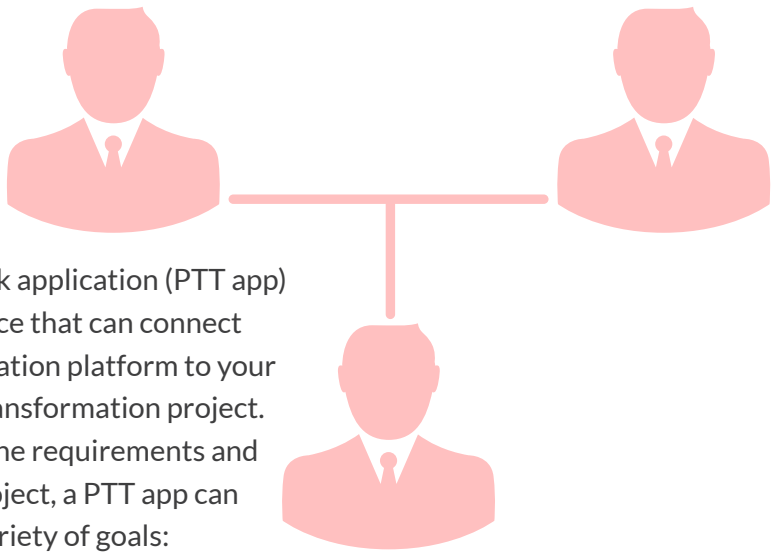
- √ IT Directors, Managers and Support; Network and System Administrators; Operations Improvement Managers; Dispatch Managers; Communications and Distributions Managers; Enterprise Mobility Managers; Mobile Device Managers; Procurement, Technology, Innovation, Operations, or Customer Support departments within an organization that have a high demand for instant one-to-one or one-to-many voice communication to improve productivity in the workforce.
- √ Carrier agents especially PTT Specialists, Account Managers and Sales Managers. Resellers of communication solutions, two-way radio sales and rentals, radio tower and frequency owners.

WHICH INDUSTRIES CAN BENEFIT?

Agriculture/Farming, Airlines, Building Materials & Equipment, Business Services, Casinos, Construction, Defense, Education (K-12, Higher-Ed), Government, Healthcare, Hospitality, Law Enforcement, Manufacturing, Mining, Oil & Gas, Public Safety, Retail, School Districts, Transportation & Logistics, Utilities, Waste Management, Wholesale.



EXECUTIVE OVERVIEW



The push-to-talk application (PTT app) is the centerpiece that can connect your communication platform to your entire digital transformation project. Depending on the requirements and scope of the project, a PTT app can accomplish a variety of goals:

1. Extending two-way radio communication

As highlighted in the first whitepaper of this series: How to Realize the Benefits of Digital Transformation in Your Organization's Two-Way Radio Communication Strategy, there are various reasons why some organizations prefer to have a portion of their workforce still communicating through two-way radios. Many PTT apps provide gateways or bridges to connect two-way radio users to mobile phone users. The benefits are that some users that do not necessarily require two-way radios, such as those in support functions, can now save costs and communicate by mobile phone within the radio network. Other users that would not typically have access to the network, could be added at very low costs in which the network could extend its user base to additional roles and departments.

Another use case we see in the public sector is that different departments within a community or city are on different radio systems. For example, the police department might be on one radio system while the fire department is on a different radio system. In an incident which requires involvement of both departments, team leaders would need to carry two different radios to be able to communicate cross-departmentally. A PTT app could connect both networks through different bridges on one or several servers.

2. Replacing two-way radio communication

Many organizations have chosen to completely move away from two-way radios and transition to PTT over LTE solutions, primarily driven by real cost savings through replacing expensive radio systems and tower fees with economic mobile devices. Read the whitepaper: Choosing the Right Mobile Device for Your Organization's PTT Solution. By introducing the PTT app to the organization, PTT communication can be augmented by adding additional functionalities around assignments into specific groups depending on status, role, GPS location etc. Since PTT apps can establish a larger number of communication groups compared to radios, the usage and separation is not only more convenient and cost effective but there are no issues around overloaded frequencies either. Organizations are trending away from analog or digital radio system towards LTE which can be seen by the rise of LTE radio handsets and also by the fact that all major manufacturers of traditional two-way radios, have heavily invested in developing their own PTT over LTE solutions to innovate their offering.

3. Making the PTT app part of the digital transformation

Depending on the level of sophistication of the PTT app and technical integration capabilities through Application Programming Interfaces (APIs), the PTT app can provide important data that can be used to improve processes and drive efficiencies.

It is important to consider that the implementation of these three strategies highly depend on the ecosystem that consists of the mobile phone, the data network, the PTT app and the PTT accessory. Very basic PTT phones on a 3G network with a very simple PTT app might simply replace two-way radio communication. However, smartphones or tablets paired with business productivity apps (often in the cloud), are integrated with PTT apps and will drive digital transformation through elevating efficiency and cost savings.

This whitepaper will provide an overview of the different functionalities that PTT apps provide, considerations that need to be made from an end user's perspective as well as from a system's perspective and pitfalls to avoid.

COLLECTING REQUIREMENTS

This perspective will help to identify the appropriate functionality within the PTT app that would allow the end user to communicate as well as collect data depending on their job type and objectives:

1. THE END USER'S PERSPECTIVE

This perspective will help to identify the appropriate hardware form factor and the level of ruggedness the device should have. Requirements should answer the following questions:

- Will the end user focus on communicating via voice or also through other means?
- What is the work environment?
- What is the skillset of the workforce?
- Is the end user supposed to interact with the PTT app at all or should the main means of communication be the PTT accessory?
- What other tasks should be enabled via the PTT app or connected apps?
- What information does the end user require to do the job at hand?
- What are the various types of end users?
- What does the regular communication profile look like for each of these user types?
- What information needs to be available for each of these user types?

2. THE SYSTEM'S PERSPECTIVE

This perspective will help to identify what capabilities the PTT app needs to have. The system's perspective covers technical requirements around the following questions:

- How easy is it to configure the application for the users as an admin?
- Is it compatible with existing mobile devices and accessories?
- Will the PTT app extend or replace radio communication?
- Are there integrations to other applications required?
- How is the communication secured?
- Is the effort to maintain the communication manageable?

THE END USER'S PERSPECTIVE

PTT APP FEATURES

This section of the whitepaper will provide an overview of the various features provided by different PTT apps. AINA Wireless works closely with approximately 50 PTT app providers worldwide. Features range from very basic communication to highly sophisticated, use case specific features. Looking at existing PTT apps out there, features can be sub-categorized into three different groups: communication, information, and settings. Every organization needs to evaluate the end user features required for their use case and select PTT apps that best fulfill those requirements.

COMMUNICATION FEATURES

Communication features relate directly to the PTT communication transmitting instant voice messages or the way of selecting to whom an end user communicates with.

Voice Quality: Voice Quality can be heavily influenced by the PTT app and the voice codecs they use. It doesn't help to have the best speaker microphone if the input audio is too low quality. In the past, it was common to use narrowband low bit rate voice codecs to reduce the bandwidth requirements. However, these days with LTE and WiFi networks that are capable of streaming large amount of data, like videos, it is possible to have wide band PTT that offers much higher voice quality than a regular phone call.

Latency: Latency in both speed but also continuity are extremely important measurements for a PTT solution. Speed is measured by simply measuring the time between a button press and the beginning of the transmission while continuity needs to be tested under different network availabilities. For example, what if LTE is not available and the mobile phone scales back to 3G. Latency can be influenced by several factors. There is a difference between an initial latency which wakes up the phone and the latency for the following transmission. Some phones "sleep deeper" but save more battery doing so. PTT apps can switch off the deep sleep at the expense of battery consumption. Another factor is server location. If the PTT app servers are on different continents than the end user latency will be impacted.

Groups and Contacts: All PTT applications on the market support one-to-many and one-to-one communication. Most of them allow you to set what groups or what contacts can be seen by what user, therefore allowing an admin to restrict certain users to only communicate with specified groups. This is a basic feature of all PTT apps.

Instant Groups: With this feature a user can create instant groups by selecting several contacts or groups and then pressing the PTT button. All selected contacts and groups will be enrolled into a new group for the time of communication until either the creator of the instant group closes the PTT call or everyone has left the instant group call.

Broadcast-Only Channels: Sometimes called hidden channels, these groups allow authorized people to broadcast to a specific group of recipients. These recipients cannot see the actual channel in their contact list and can therefore not respond to this channel. This can be extremely useful for one-to-many announcements where a large group of people need to receive information but it's not necessary that they respond.

Multi-Listening: Multi-listening allows a user to listen to the communication of several groups at the same time. This is a big advantage to most two-way radio apps where you were only able to listen to the channel that you were in.

Channel Scrolling: Channel scrolling is a feature supported by the app but executed through a PTT phone or PTT accessory. It works in a way that a button press on the accessory, moves to the next channel or contact which should be announced to allow the user to change channel simply through using the accessory without looking at the phone. Some PTT apps have created smart algorithms around channel scrolling to exclude channels that a specific user has in its list but never communicates through. A good channel scrolling feature can improve communication efficiency significantly.

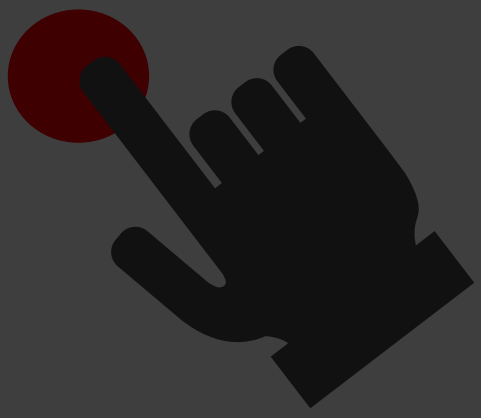
Replay: This feature allows a user to replay the last incoming message. It can lead to much leaner communication, avoiding any back and forth on requests to repeat the last message. The replay feature requires the PTT app to have a communication recording functionality that would allow the replay of a certain number of messages or messages from a certain time frame such as the last 30 seconds. Like the emergency button, the replay feature is something that becomes more effective if leveraged through an accessory.

Supervisory Override: A supervisory override function allows an authorized user with this functionality to interrupt any ongoing communication. As two-way radio communication or PTT apps use half-duplex communication protocols which are always one directional at a time, it may happen that a user accidentally blocks the communication channel by not releasing the PTT button or the button gets locked in the down position. Users of wired accessories that use toggle mode functionality are more likely to forget "releasing the floor". This can lead to significant communication downtime. Supervisory override may work in different ways. One option is that the supervisor can interrupt the ongoing communication and notify the user who was blocking the communication. Others allow to temporarily lock out the user from a group. While these are reactive ways to ensure effective communication, some PTT applications have established preventative features such as an automatic timeout after a certain time period, such as 30 seconds. Knowing that most PTT communication is around five to seven seconds, a timeout function is a valid preventative feature.

INFORMATION FEATURES

EMERGENCY FUNCTION

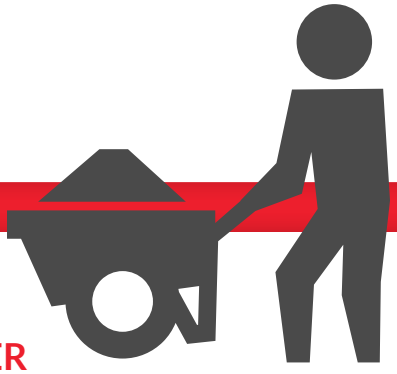
An emergency function allows the end user to alert specified users in case of an emergency. An emergency function especially when supported by a PTT phone or PTT accessory can be life saving. Communication needs to be even simpler in an emergency situation. Expecting a non-tech-savvy person to swipe the screen, potentially enter a PIN, go into specific options and then press a button to initiate an emergency alert, is too much to ask under stressful circumstances. To get a worker to remember to press the red button on the speaker mic if something goes wrong, is an reasonable single step request. It is therefore important that the PTT app supports emergency functionality on PTT phones or PTT accessories in order to ensure workers' safety.



EMERGENCY FUNCTION INTEGRATIONS

Different PTT apps handle emergency button presses in different ways depending on different use cases. While a direct call to first responders, like a 911 call is not advisable due to false alarms, a direct call to a specified emergency group or a prioritized call to Dispatch is more advisable. Contacts in this group can then take the appropriate steps supported by GPS location features in the app. It is important to know that GPS features on the phone are providing a better location than the location provided to first responders when dialing the emergency number. While GPS is up to five meters accurate, information from cellular calls can be miles away.

In addition, call takers of first responders have difficulties receiving appropriate information especially the location from people under stress. An emergency contact or dispatcher can clearly identify the location through the PTT app and be in contact with the person in distress while being on the phone with the first responders. Some use cases such as in hospitality and hospitals, require an emergency alert to indicate the location to a responder and directly open a channel that records everything until the alert is disabled. This helps to bring security quickly to the incident and provide proof in the case of a potential lawsuit.



LONE WORKER

Lone worker functionality can be seen as a passive safety function in addition to an emergency function that requires an end user to regularly interact with another user to notify that everything is okay. Compared to an emergency button which requires an active press of the button to notify that something is not okay, the passive lone worker function triggers an emergency alarm if there is no interaction. A lone worker function is a timer which is set for a specific time period such as five minutes. If the time is about to expire, the user gets notified. By pressing a button (not necessarily the PTT button), the timer resets to the original elapsed time from where it counts down again. Additional lone worker functionalities called “man-down alarm” use the accelerometers provided in the phone or accessory to notify if the device is in an unusual position, such as horizontal or if the device accelerated beyond a certain threshold which could mean someone fell.

REMOTE CONTROL

This feature allows an authorized person to remotely take control of another mobile device and the connected accessory to record video via the camera, enable the mic, or transmit audio through the speaker. This features is often used in combination with the lone worker function or in covert operations. It is very important to consider all local regulations before using this feature. It should not be used to surveil employees by switching on their cameras or microphones to see what they are up to.

MESSAGES

Similar to any chat application like Facebook Messenger or Whatsapp, PTT apps can also send text messages to provide written information in case voice communication is not appropriate.

FILES

Some PTT apps allow users to send any type of information such as pictures, audio files or videos to provide a better overview of the situation or document a scene.

TASK MANAGEMENT

PTT apps have integrated task allocation features that can be given to individuals or groups to complete and report on. These can be all kinds of tasks from moving to or from a parameter, providing pictures or videos of a certain location, or even PTT unrelated tasks like restocking items in a warehouse or retail shop.

GPS LOCATION

Map features are increasingly important to leverage not only to provide the right information to specific users but also to integrate that information to other applications. GPS location can be extended with additional features:

- GPS History: Also called breadcrumbs, it allows authorized users to see where other users have been over a specific time frame.
- Geofences: Allows an admin to draw geographical lines around a certain area allowing automated events to be triggered by the PTT app once a user enters or exits these geofences.
- In-House Location: As GPS only provides a two-dimensional overview, this information is useless when a person is in a multi-story building like a hotel, a university or a hospital. Some PTT apps provide custom services to integrate blueprints into maps using wifi-hotspots to provide three dimensional in-house location services.

GPS LOCATION ENABLED FEATURES

These features can be used and set up in different ways:

- **Map Overview:** Allows all authorized users to see where other group members are.
- **Dynamic Groups:** This feature allows users to create an automated group depending on a specific region. This can be implemented either through a geofence in which everybody in that fence gets automatically enrolled into a specific group or as a map feature where you automatically communicate to everyone seen on a map which you can modify by zooming in and out.
- Some applications provide complete user profiles including skillsets and equipment to facilitate task management solutions in work areas or in disaster zones to move the right people into a specific area and guide unequipped or untrained people out of a specific area
- **Routing:** GPS Location can be used to request an end user to stay on a specific route. Deviations from this route are automatically reported. This feature can be combined with other routing technologies such as Near Field Communication (NFC). The phone is held close to tokens which are placed in specific locations to check off that the user has been to the locations. NFC is often used in the security industry for in-house purposes.

SETTING FEATURES

Setting features do not provide information or communication but allow the end user to customize the PTT app. Depending on the user type, specific setting capabilities can be enabled.

Audio Settings: Audio settings can be output volume settings including silence or vibration as well as input sensitivity of the mic.

Tone Settings: Tone settings allows switching tones on or off or modifying them when pressing and releasing the PTT button or when receiving a PTT call.

Notifications: Notifications, notify the user of a missed PTT call or other message.

Priority Settings: Priority settings are useful if a user is listening to several channels and there is overlapping communication. Some apps will backlog messages and play them in order or prioritize them. Priority settings allow a user or admin to assign certain contacts or groups a higher priority so that they would always be played first or even interrupt existing communication. This is the same for regular phone calls which can be prioritized or de-prioritized over PTT calls.

Default Callee or Groups: By allowing a user to specify a default callee, the end user will set a contact that is always reached when pressing the PTT button unless someone else established a PTT call and the user is currently on that call.

Accessory Settings: Accessory settings allow the user to change or modify accessories, change the default paired Bluetooth accessory or enable or disable specific features on the accessory.

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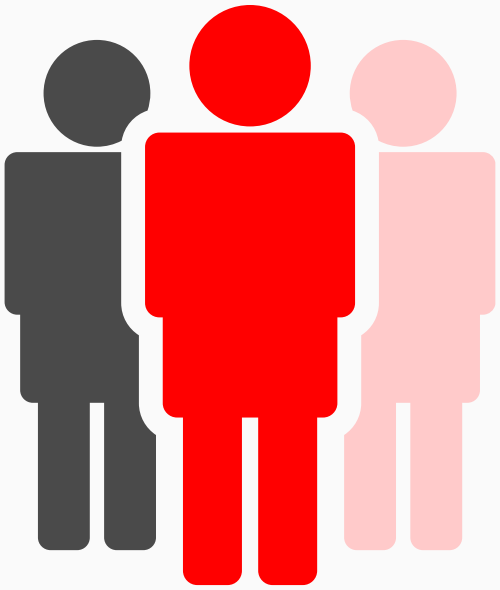
Having identified the features that would help workers do their job and take advantage of the PTT app capabilities to not only replace two-way radio communication but drive further efficiencies, is a big step. A strategic change management plan, especially for an older workforce, needs to be considered. Someone who has been working a certain way for 20 years will have a hard time adapting to new processes and technology. It is therefore important to analyze the types of end users and leverage a user centric approach.

END USER TYPES

To drive a differentiated approach to the end user perspective, these end users need to be segmented into different groups. The segmentation should be guided by the different needs for communication. Often this is done by job title or level in the hierarchy within the organization which might lead to giving the wrong people too many communication possibilities or too little.
Guiding questions on end user segmentation are:

- With who should this person communicate with on a regular basis?
- Would these people be the same type of end user?
- Can these people be categorized into one group?
- How many groups or contacts would someone communicate to on a regular basis?
- How mobile phone/technology savvy is the user?

It is possible that within a team there are different end user types based on their skillset.
If you are looking at not only replacing two-way radio communication but also expanding it to more users as the cost per user is significantly lower than for land mobile radios (LMR), you will probably add more user types and will be able to drive a better segmentation of users than you did through radio traffic. If you are looking to simply replace two-way radio communication, you can stay with the existing groups/channels that you used for LMR.



PITFALLS TO AVOID

One very important thing that many PTT solution decision makers and PTT solution providers forget, is that for most end user groups, it is not their job to facilitate PTT communication. Exceptions include dispatchers whose focus is communicating with end users. Increased communication functionality can be more beneficial depending on the skillset of the workforce. With millennials who are mobile phone application savvy, gaining a bigger share in our workforce, there are fewer problems. However, with a workforce that has used only a PTT button to communicate, a PTT application with too many functions can be highly confusing taking the attention away from the actual work which can cause reduced productivity or even accidents.

END USER PROFILES

Depending on the end user types, the profiles should be configured. This could look like the table below. While the Basic profile provides more or less a substitute to very simple one channel radio communication, the Intermediate profile already offers additional features that clearly differentiates PTT over LTE from LMR communication. The Advanced profile is something that should be reserved for supervisors and admins and there could possibly even be a distinction between the two groups.

	Basic	Intermediate	Advanced
Communication	1 group	Groups & Contacts Instant Groups Multi-Listening Replay	Groups & Contacts Instant Groups Multi-Listening Replay Broadcast Channels Supervisory Override
Information	Emergency Function	Emergency Function Lone Worker Messages Files Task Management GPS Location	Emergency Function Lone Worker Messages Files Task Management GPS Location GPS History Geofences Remote Control
Settings	Bluetooth Pairing	Bluetooth Pairing Accessory Settings Audio Settings Tone Settings Notifications Default Callee	Bluetooth Pairing Accessory Settings Audio Settings Tone Settings Notifications Default Callee Priority Settings

THE SYSTEM'S PERSPECTIVE

The System's Perspective will look at the requirements usually determined by the department that needs to implement, maintain and update the PTT application. They are all important things to consider but usually do not affect the end user.

CATEGORIES OF PTT APPS

There are four categories of PTT applications, which are differentiated by the type of vendor offering them:

1. **Carrier-Grade PTT Applications**
   As the name states, these solutions are offered by the carrier. Since a carrier is in most cases the network provider and often the provider of mobile phones or tablets, it is logical that most carriers also offer a PTT solution, making them a one-stop-shop. In the US, except for T-mobile, all carriers offer a carrier-grade PTT app. Due to the direct network integration, the carrier-grade solution promises a higher Quality of Service (QoS) as traffic of PTT apps and others can be prioritized which is an advantage during poor network coverage or within saturated networks. Nevertheless, both Verizon and AT&T offer traffic management solutions to their customers which would allow the customer to prioritize the PTT app of choice.[1] Carrier-grade PTT apps are also usually able to offer a convenient package solution including very low costs due to low cost feature phone integrations like flip phones, PTT only data packages, and overall bundle prices. Also there are some post service support advantages, such as having just one bill and a single point of contact available 24/7 to provide solution support.[2,3]
2. **Over-The-Top (OTT) PTT Applications**
   Over-the-top in this case means that the PTT solution is a layer over the general mobile phone provider network which directly describes its main advantage over the carrier-grade solution. OTT PTT apps are carrier agnostic and can work on any data network which is relevant if in certain areas the network provider has bad reception or for cross-border operations.
3. **White Labeled PTT Applications**
   White labeled versions are usually versions of OTT PTT apps, customized for small to medium sized communication solution providers. These solutions offer direct support, customizations and other value added benefits to justify their place in the market.
4. **Mission Critical Push-To-Talk (MCPTT)**
   First responders worldwide are slowly moving over to PTT over LTE solutions. This has led to the term Mission Critical PTT (MCPTT) applications in opposition to commercially used but still business critical PTT apps. ESN in UK and FirstNet in US are just two examples of such networks.

These types of PTT applications provide differentiation across a number of factors:

ADMIN OR DISPATCH CONSOLE

The admin or dispatch console is the brain of any PTT system. Most PTT apps provide web-based admin or dispatch consoles which can be accessed from any device in the world with the right login and password. Some require a program that needs to be downloaded and can only be used on that specific device. A good console will help you roll-out and support the solution by creating customer profiles based on the customer types and configuring the PTT app and all related features and accessories in bulk. It can be very time consuming especially in larger deployments to be required to configure every mobile device and change settings, groups and contacts manually. The console will allow you to set the features and settings and then block the end user from accessing these capabilities.

The console should also help you identify how emergency button presses are handled and what groups or contacts will be informed to align with your emergency procedures.

COMPATIBILITY

First, a PTT app needs to be compatible with the chosen mobile device. While most PTT apps offer Android and iOS support, Windows and Blackberry phones are not as common. Only very few OTT solutions offer basic phone integrations, like BREW OS, which is an advantage of carrier-grade solutions. Many PTT apps integrate to PTT phones directly connecting to the PTT button on the side of the phone. Secondly, a PTT app needs to be compatible with at least Bluetooth 4.0 and preferably Bluetooth 5.0 in order to integrate with Internet of Things (IoT) solutions. Bluetooth becomes very important in combination with PTT accessories. In this case, not only does the Bluetooth 4.0 support but also the feature integration from the app to the accessory becomes important. The best emergency function loses its relevance if the emergency button on the PTT accessory cannot be used due to the lack of an integration.

DEPLOYMENT & UPDATES

While most PTT apps can be downloaded from the Apple Store or Google Play Store, this is not really a solution for large deployments. In these cases, PTT apps need to provide apk files that allow the distribution through Enterprise Mobility Management (EMM) platforms such as AirWatch and MobileIron. PTT apps are innovating and improving at a high pace with features added almost on a monthly basis. It is not only important to stay up to date with these improvements and new features that could be leveraged but also to regularly evaluate the ecosystem of mobile devices, data networks, PTT apps and accessories available. It is important to manage updates and roll them out appropriately. If new features are rolled out, training of the workforce should not be overlooked.

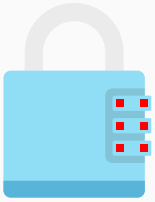
RADIO NETWORK INTEGRATION

While the ultimate goal is to entirely switch from LMR to LTE, for many organizations the switch is difficult to accomplish. Most PTT apps offer solutions to integrate LMR communication into PTT communication. it is important to attain details on what radios systems are interoperable with the PTT app and what features can be integrated. For example, DMR Tier 1 and Tier 2 are easier to find through simple gateways while Tier 3 integrations including texting features and GPS are only implemented by a few PTT apps. For organizations trying to bring several different systems on several channels together, the costs might be relatively high and one should consider moving some radio systems (especially if analog) completely to LTE instead of integrating too many systems into the PTT over LTE solution.

INTEGRATION TO OTHER APPS

If the PTT app is really intended to be a part of the digital transformation and not an isolated solution, it is important to make the PTT app integratable with other solutions. This includes integrations with other vendors or in-house solutions. To make an app communicate with other solutions, a software development kit (SDK) or application programming interface (API) needs to be provided by the PTT app. Here, it is important to check what kind of data can be exchanged through the SDK. Some PTT apps have already built partnerships with third-party vendors implementing the PTT solution into their app, for example, adding the PTT over LTE component to a fleet management solution.

SECURITY & RELIABILITY



The IT Security team should always double-check a PTT app during the evaluation process, from both a security as well as a reliability standpoint. The first question is often, where will the data reside? Will it be on its own server (on-premise) or in the cloud. This has an enormous impact on the budgeting as on-premise solutions would have a much more significant impact on CAPEX while most of the cloud solutions can be paid from OPEX. Although many organizations consider on-premise solutions more secure than cloud, since all data is in their own hands, a consideration is that most PTT application actually offer a seamless system using cloud solutions like Microsoft Azure or Amazon AWS which meet high standards of cyber security.[4,5] In the US, AWS offers a specific Amazon AWS GovCloud which gives vetted government customers and their partners the flexibility to architect secure cloud solutions that comply with: the FedRAMP High baseline, the DOJ's Criminal Justice Information Systems (CJIS) Security Policy, U.S. International Traffic in Arms Regulations (ITAR), Department of Defense (DoD) Cloud Computing Security Requirements Guide (SRG) for Impact Levels 2, 4 and 5, FIPS 140-2, IRS-1075, and other compliance regimes.[6] Furthermore, these solutions provide additional redundancies, should one server go down. Compared to a LMR system, the costs are still relatively low and most of the time servers are needed by any company to run other business applications or even the website. Nevertheless, proper security measures need to be taken to ensure voice communication is not being compromised.

While the stored PTT app data (data at rest) is one concern, the PTT app data while being transferred (data in transit) is another big concern. Most PTT apps offer AES-256 encryption. Some apps offer an additional level of encryption within the encrypted channels called end to end encryption (E2E). With this feature, two parties set up a unique pair of keys that specifically encrypts the communication between the two endpoints.

Since most PTT apps provide web-based admin consoles or dispatch portals, there needs to be measures in place to protect the logins from being compromised. A compromised password to the admin console of a PTT solution can have dramatic consequences. All users and channels could be deleted within a few clicks. Consequences could be that the complete solution needs to be rolled out from the beginning. Multi-factor authentication (MFA) potentially in combination with Single-Sign on (SSO) could be preventative measures. MFA requires an admin who entered their password on their computer to also enter a code provided by a token or an SMS or to authorize the login in a separate authentication app like Google Authenticator.[7] Some PTT apps and even IT departments, limit the access to the admin console to only the company location (via IP address) or via a virtual-private-network (VPN).

MANAGEMENT OF DATA & REGULATIONS

Depending on the country of residence of the end user and the organization, there are a few limitations with data collection. Since it is an employee using the device, there are certain rules involved on what data can be collected and what cannot. Some of them, depending on the country have been made into laws by legislators, others are imposed by work councils or labor unions. Recording and logging of voice, video, text, location, etc. can be very useful as evidence or for training purposes. However, these are often personal identifiable information that need to be managed (stored, viewed and deleted) according to procedures that meet the requirements of regulations such as the GDPR (European General Data Protection Regulation).[8]

SERVICE

Service can be utilized across many different levels of an organization from administrators to users at all stages of the relationship with the vendor.

Service availability and support:

- What does the SLA look like?
- Is there a 24/7 number available to call?
- How quickly are tickets solved?

Service documentation:

- Is there an onboarding service or training for the solution?
- Does the PTT app provider provide any guidance or documentation on how to implement the solution, such as, how to create a channel strategy?
- Is service and documentation provided in your language?
- For companies with global operations, are all relevant languages supported?

CONCLUSION

We have seen that regardless of whether PTT over LTE will replace or extend two-way radio communication, the advantages of a PTT app over regular two-way radio communication are tremendous.
By creating end user types and end user profiles that consider all departments and levels within the company, an IT team can execute a smooth change management plan to facilitate the implementation of the solution, on a human level.
The combination of specific feature availability, reliability, service and convenience will decide if your organization should go with a carrier-grade, an over-the-top or a white labeled PTT solution. Each of these type of PTT apps come with their unique benefits.
Apart from the end user feature set, the admin or dispatch console which can be seen as the brain of any PTT system, is an important element to demo and trial over a two to four week period. Questions to consider are:

- √ **Will it allow for an easy addition of new users?**
- √ **Can they be moved to different groups?**
- √ **Can it configure/restrict what the user sees in the app?**
- √ **Will it establish all settings from audio to accessory settings?**
- √ **How does it manage the decommissioning of devices that have been stolen or lost?**

For many users that want to extend their two-way radio system by adding users, moving some users to PTT over LTE but keeping some on the LMR, the integration to the right radio system is of utmost importance. Not every gateway or bridge will do the job and the interoperability needs to be accessed excessively.
Compatibility with the right mobile devices is important but also without the right PTT accessories available, you will find your workers more focused on their new mobile devices instead of their jobs. PTT accessory compatibility will help to create a seamless transition from LMR to PTT over LTE.
For organizations that want to make PTT over LTE a part of their digital transformation project, an SDK or API that allows them to pull data points from the PTT application is required.
Finally, the reliability and security of the PTT app infrastructure needs to be examined around encryption and redundancies and internal processes need to be put in place to prevent unauthorized access to the admin console, to prevent business critical communications being shut down completely.

CONTACT OR BOOK A MEETING FOR A FREE CONSULTATION

THE AUTHOR

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Daniel Hackl has provided consulting to hundreds of customers in small and large companies and organizations across all industries during their PTT over LTE projects. Over his career he has established an extensive network of partners within the PTT over LTE ecosystem that he leverages to find the right solution for his clients.

Daniel Hackl holds two Masters degrees in business and a certificate in Digital Strategy from the University of British Columbia. He also brings experience in project management and is CompTIA Security+ certified.

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