The Intelligent Link: Evolving Technology that Works Together
By Cuneyt Ornek

You have probably noticed that, during the last 30 years, technology integration has affected, sometimes in a very subtle manner, the way we work, the way we live, and yes—even the way we cook. From ovens that can heat dinner using conventional heating or microwaves to personal communicators that can switch automatically from analog to digital services, many products we use today have evolved in a manner which, at one point in time, involved the integration of two or more distinct technologies. Aircraft cockpits, for example have evolved from a mosaic of dials, switches and gauges (just to name a few!) to half a dozen multifunctional color screens that display and control radio, hydraulics, GPS, digital communications and navigation. Add a joystick and you're flying!

The impact of this technology integration on aviation safety is astounding. In fewer than twenty years, the number of aircraft accidents has dropped by 40%, while the loss of lives due to these accidents has been reduced by almost 50%. Interestingly, a closer look reveals that numerous functional and operational similarities exist between the task of carrying hundreds of lives from point A to point B safely and that of saving a life through a phone call. Both activities demand trained personnel capable of taking split-second decisions with extreme precision and little or no margin for error. In both environments, tolerance to equipment failure is nil and redundancy is a de-facto standard. And finally, both pilots and PSAP operators rely heavily on their systems' ability to present and process information in a uniform and consistent manner, regardless of its origin and the technology used to obtain it. While the integration of technologies such as telephony, radio and video in public safety answering points have not yet matured to the levels reached by the aviation industry, vendors are aware of this requirement, increasingly focusing their efforts on product integration.

This end-to-end approach is a step toward separating technology—the means to perform a task— from the task itself. Systems that provide increased PSAP-wide functionality to their users invariably require interaction with multiple technologies. Nevertheless, from a call-handler's perspective, the technology or services involved in performing a particular task are not important. Whether voice is delivered to the headset through a traditional audio path or using digital technology is totally irrelevant. What really matters is the ability to communicate with the other party. Much in the same way when dialing out on a mobile phone: do we care that the link is established using digital or analog service? Not really. The requirement is to communicate with the most appropriate technology, whatever it may be at that point in time. In fact, the simultaneous support of multiple mobile technologies has significantly improved the quality of the core service—that of communicating—by expanding its limits of availability.

An Architecture that Saves Time
Being able to handle multiple technologies is only part of the solution to the complex task of handling an emergency situation. It is not a secret to anyone that factors such as budget restraints, PSAP consolidation and the shortage of applicants to this demanding profession are

increasing the workload on call takers and dispatchers. This is where "how" you integrate becomes as equally important as "what" you integrate. Let us consider, for example, an emergency call handling solution that seamlessly integrates telephony and radio technologies and presents them in a uniform and consistent interface.

In such an environment, dispatchers interacting with multiple parties are no longer required to repeatedly switch between their radio and telephony consoles. Operator comfort, as well as the efficiency with which the calls are processed, are greatly improved. Furthermore, a unified user interface that presents information from different technologies in a merged and consistent format requires less training than the traditional multi-system environment. The combination of these factors provides the flexibility in resource management that today's PSAP managers need to better utilize their personnel working long shifts in a high-stress environment.

One way to ease the pressure on the dispatcher during a crisis situation is by reducing the number of tasks he or she has to do to perform his or her duty. In an integrated environment, a single interface that interacts with multiple technologies has greatly facilitated the implementation of automated procedures. The end-to-end architecture, through its information sharing mechanism, is thus removing the operator from the critical path required to perform a task. An analysis of the steps involved in handling an emergency situation clearly reveals the operator's crucial role in assessing the seriousness of the incident by collecting vital information.

Once the nature of the incident is established and while the call is still in progress, the system can be instructed to automatically dispatch the appropriate resources to a location transmitting captured data from the call taker's workstation. Live audio and video could be fed to mobile units before they arrive on the scene, reducing risk of intervention and increasing quality of service. Fax technology can be used to automatically deliver premise information to dispatched resources before they arrive on the scene. All this is only achievable through a solution capable of interacting with every technology involved in delivering these services. The end result is a dispatcher more concentrated on maintaining contact with the caller and collecting information rather than performing the individual—and mostly repetitive—steps in relaying this information to those who need it.

Reclaiming Your Workstations
In terms of desktop real estate, a call handler's work environment specifications are similar to those of the airplane cockpit described above. Technology integration and multifunctional components have become two of the most important design elements for the development of future generation intelligent workstations.   The increasingly rapid evolution of the computer industry is providing vendors with integration capabilities that were not available only a few years ago…

Computer graphic cards can now display external video feeds so that a separate TV monitor is not required. The introduction of low-power, small footprint flat screen LCD technology offers the possibility of clearing the desktop of large CRT-based displays. Advances in hardware components and operating system software now allow a single workstation computer to support multiple display units. This means a single keyboard and a mouse can accommodate interaction requirements for three or more displays. The integration of these technological breakthroughs,

combined with the development of advanced public safety applications that take advantage of these new capabilities has dramatically reduced the requirements on desktop real estate. Furthermore, the significant reduction in the number of components required to deliver a solution greatly improves its reliability. This is a particularly important fact considering that PSAPs are highly mission-critical environments.

Evolution Never Ends
The public safety sector is increasingly in search of end-to-end solutions that offer simplicity, efficiency and reliability. This application-level integration is allowing vendors to establish intelligent links between technologies that were once independent from each another. The dispatcher was, in fact, part of the data transport mechanism, relaying information from one system to another. New integrated product offerings capable of interfacing with the various technologies of information exchange allow the operator to focus on the human aspects of call handling, such as interacting with the caller and assessment of situation.

Product evolution in the coming years will be greatly influenced by the evolution of technologies used to transport information to the call handler's desktop. Advancements in areas such as voice recognition, wireless networks and video conferencing will not only affect the manner in which dispatchers interact with their systems but also the way they communicate with the callers. The industry is already busy preparing the framework to support this evolution. Because before we know it, a 9-1-1 call will no longer be voice only.

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