

## Movers & Shakers Interview with Alexis Charbonnel, Automotive Business Development manager, Arkamys



*Arkamys is a French-based company specialized in digital signal processing. Its audio processing solutions are applied in the sectors of Consumer Electronics and Car audio.*

*Arkamys was founded in Paris in 1998. The company initially used its patented sound spatialization process to remaster movies and DVDs for the professional entertainment industry. Today its audio enhancement software is implemented in consumer electronic products, such as mobile phones and mp3 players, as well as portable media players and car audio systems, where they are developing rapidly – a major European vehicle manufacturer already equips the majority of its new vehicles with an Arkamys solution.*

### **In an audio market with a very high penetration rate for original equipment, how do vehicle manufacturers try to differentiate themselves?**

The increasing amount of information processed by a car, as well as more and more powerful power units has given this Head Unit a fundamental role in the car. The Head Unit has become a multimedia platform, which is processing more and more information. This has led to an increase of original equipment penetration to the detriment of after-market.

For manufacturers, the effects are different depending on vehicle segment. Audio offers can be divided into three categories which address different client needs:

- The entry level, where cost is key;
- The core-range, in which audio is a differentiating factor and must be able to hold any new format, device, connectivity, communication and navigation needs;
- Hi-Fi, i.e. premium sound which is brand driven.

### **What are the manufacturers' solutions to differentiate themselves?**

Their real challenge is to offer audio systems that bring a good audio quality to all clients without constraining the project or the cost.

The solution is digital sound processing products that benefit from the increase in process capacity of head units.

### **What are the other challenges that manufacturers face when setting up audio systems in vehicles?**

Decreasing development periods and improving productivity to reduce costs are challenges which manufacturers must face.

However, the main challenge is addressing client needs. Indeed, client needs are driven by consumer electronics which have a life cycle of one year. There is a lapse of time as long as 8 years from the moment you specify the car audio until the sales of the last car equipped with this radio is sold. This is the real challenge.

### **Another challenge is the fact that car cabin constraints as well as the speakers' location are not optimal for good sound propagation and rendering?**

This is a constraint but also an opportunity as the car cabin is always the same – once we know its acoustic, it does not change during the period in which a vehicle is sold. Digital

Sound Processing can improve the audio system inside the vehicle but also make the best of the car cabin acoustics.

Since we know the position of each passenger in the vehicle, we can restrict the number of parameters and focus on personalizing the sound for each vehicle seat or for specific configurations (driver alone in the car, 2 passengers in front, four people in the car, etc.)

### What are the different sound-enhancement solutions available to manufacturers today?

Today, there are 3 different types of solutions in vehicles:

- **“Premium sound” solutions** which multiply the number of speakers and amplifier power to improve sound quality. However these solutions are very constraining for the vehicle manufacturers when it comes to speakers’ integration in the vehicle audio platform. They are brand driven but high prices limit penetration.
- **The standard audio features** such as balance, fader, and loudness offered by Tier 1 audio suppliers. Those basic features used to be analogical solutions but are now offered as digital.
- **Digital Sound Processing**, offered amongst others by Arkamys. The objective is to leverage the head unit processing capacity to implement sound treatment algorithms without modifying the original speaker configuration of the vehicle. With Digital Sound Processing, we can offer a customized sound signature, enhance sound significantly as well as reduce hardware costs.

### How much do these solutions cost?

A premium sound system can cost from 800 to 2,500 EUR from a generalist vehicle manufacturer to a premium one.

As for digital sound processing solutions, the only cost is the software integration in the vehicle as there is no hardware - prices are therefore only a couple of Euros (<10 EUR) and vary with volumes.

### It is not easy to understand the differences between the digital sound processing solutions offered by various actors. What are the differences between Arkamys and its main competitors?

Some of our competitors have a research lab background and focus on solutions tuning the sound to the vehicle car cabin constraints to fix acoustical problems. Those solutions are customized to each car model and hence are usually available only as original equipment.

On the other hand, other competitors come from the consumer electronic sector with an expertise in sound effects. However they are usually not in a position to customize those effects to the vehicle car cabin. This is why you will find most of these solutions in the aftermarket.

**Arkamys combines the strengths of these 2 types of competitors.** We are able to improve sound quality with acoustic compensation algorithms, tuning tools and audio engineers’ “golden ears” but also offer value added features using specific audio effects (e.g. Surround, Bass exciter).

### Why are you the only player able to combine those two key strengths?

We benefit from a cross-sector experience to offer the best in-car audio solutions. Our historic background in cinema and music post-production naturally led us to focus on the audio rendering fidelity within the vehicle car cabin. Furthermore, our presence on other sectors such as mobile phones and nomadic devices has led us to develop very efficient algorithms as MIPS (Million Instructions Per Second) constraints are very high in such devices.

Therefore, we are the only player able to integrate the digital sound processing that corrects the car cabin acoustic within the head unit (processing capacity required by our algorithm are very limited).

Our success story with vehicle manufacturers such as Renault is a good illustration of this. You can find an Arkamys solution in almost any of their 2010 vehicle range.

### **How can a small company like Arkamys work with such a big firm like Renault?**

Our long term presence in many sectors has helped us to build a very strong expertise in digital sound processing which we leveraged to sign partnerships with blue chip companies such as Thales in the aeronautic sector or Sony Ericsson in mobile phones.

Leveraging our expertise to the automotive sector has enabled us to offer sound enhancement solutions with low MIPS requirements hence limiting head unit integration constraints as well as reducing hardware costs.

### **How did you manage to convince them?**

When we first met Renault, their objective was to improve their audio quality reputation as well as launch a specific "Renault sound".

We had a demonstration "before / after Arkamys" on one of their vehicles, and we could see what we call the "smiley effect" on their face. You don't need to be audiophile to perceive the difference with traditional audio systems and enjoy the benefits of our solution.

Arkamys positioning is on listening comfort and rendering quality. Our "golden ears", i.e. our sound engineers, guarantee an excellent sound signature on most of Renault vehicles.

### **What type of audio solutions developed by Arkamys can be found at Renault?**

Today, Arkamys is a strategic partner for Renault and provides audio solutions tailored to the needs of each vehicle segment:

- Standard sound core-range vehicles enables to get rid of tweeters while still improving sound quality. This cost reduction approach is available on vehicles such as Twingo and Clio.
- On the upper range vehicles such as Megane, Laguna and Scenic, Arkamys brings its expertise to create a dedicated Renault sound signature by lifting the sound scene in front of the passengers and optimizing the sound spacialization. This offer is branded as "3D Sound by Arkamys".

### **First cars equipped with an Arkamys solution were launched in 2008. Since then, how many cars have been equipped with your solution?**

More than one million vehicles equipped with an Arkamys solution have been sold. New equipped models are launched every month, such as recently the Renault Samsung Motors SM5 and QM5. Moreover, in the next 2 years, seven new brands will launch vehicles embedding solutions from Arkamys.

### **When do you see the majority of vehicles equipped with such products?**

I believe that 50 to 60 per cent of vehicles could be sold equipped with digital sound processing within 5 to 10 years, with solutions offering more and more features. The main consequence for us is that we have to be present in both mature and emerging countries. In addition to our historic presence in Europe, we recently opened new offices in Malaysia, South Korea and Canada.

### **Today Arkamys products offer a signature sound, lift the sound scene in front of the passengers, etc ... Can you tell us a bit more about other features which are available as well as future innovations?**

Our automotive audio product offer is developing rapidly. In addition to the products we already mentioned, we offer multiple solutions to improve sound rendering. For example, we can harmonize volume between various audio sources and tracks, but also adapt it to vehicle speed which requires a fairly precise implementation.

We also offer solutions like echo cancellation and noise reduction (ECNR) to improve voice quality.

Continuous innovation is crucial for us as we want our customers (the manufacturers) to stay at the forefront of innovation and in contact with the consumer electronics by offering state of the art products to their clients. We are currently focusing our efforts on improving the Human-Machine Interface (HMI) as well as developing solutions for active noise reduction.

**A manufacturer comes to see you tomorrow; he is interested in your product. What do you have to offer?**

A product demonstration: this is our first key success factor. Being able to compare "before" and "after" Arkamys on one of the manufacturer vehicle is the best way to demonstrate the benefits of our solutions. Our clients are usually amazed to see such differences with a digital signal processing solution from Arkamys.