HetNet planning to combine strong performance and ROI

**A conversation with
Bernard Breton,
Senior VP, Americas and APAC
Sales, and Chief Marketing
Officer,
InfoVista**

By Frank Rayal

SENZA FILI CONSULTING

Frank Rayal. Hello, and welcome to this conversation with Bernard Breton from InfoVista. I am Frank Rayal. This conversation is part of a Senza Fili report on heterogeneous networks and the latest solutions from the wireless ecosystem that will make HetNets a reality.

Today, we have with us Bernard Breton, Senior VP, Americas and APAC Sales, and Chief Marketing Officer at InfoVista. InfoVista is the leading provider of IT and RF planning assurance and optimization software solutions and services, which enable efficient network and IT transformations.

Bernard, I would like to start by asking you to give us a brief overview of InfoVista.

Bernard Breton. We are essentially providing software solutions for the planning, optimization, management and monetization of networks. When I say networks, I mean the entire network for all the domains, from the core, even from the data center, up to the edge or the access network, both in the wireless domain and the fixed domain.

We are working globally with wireless operators, CSPs and MSPs in more than 135 countries. We work with 80% of the tier-one operators in the world in various capacities. We help them in deploying better networks and in managing their networks in better ways, so they can anticipate and roll out transformation projects to improve the overall performance and ROI of their network.

Obviously, we tend to be quite leading edge, especially on the planning side, where we are involved with the rollout of new technologies. Of the topics that we'll address today here, heterogeneous networks are very much relevant in the space of planning and optimization, where we believe at this point in time are the primary challenges for wireless operators.

Frank Rayal. What challenges do operators tell you are raised by small-cell and heterogeneous network deployments?

Bernard Breton. There are a lot. It really depends on which geography you are talking about. If you focus on the geographies that are first to market with a heterogeneous network, I'm hearing the real challenge is how do we fix the equation between the benefit of rolling out a heterogeneous strategy – the technical benefit, like the amount of traffic you are going to capture – and the financial aspect, so that the ROI is strong?

It is all good to say that small cells are the right technical solution, but they also must be the right financial solution. So we are stuck in that dilemma of needing very much of a cookie-cutter approach for small cells in order to reduce the overall cost associated with deployment, rollout and ongoing management, but not at the expense of undermining the technical performance of the network.

Sponsored by

InfoVista

While we call them small cells, they are just cells in the network. They participate in the overall delivery of the payload to the subscriber. They also participate in the overall radio environment that will lead to having a good or a bad radio experience.

Frank Rayal. You mentioned that as part of the cost equation, the planning and the deployment processes are a big component. What specifically are you doing to help the operator solve this problem?

Bernard Breton. Multiple things. First of all, with our planning solution, Mentum Planet, we can help the operators understand where they are going to get the maximum technical benefit in terms of the amount of traffic that will be captured, and also the amount of traffic that will be offloaded from the macro network by the small cells, so the operators can maximize the outcome of deploying small cells.

We can also help them on the financial side by ensuring that deployment constraints, which can lead to increased cost, are taken into account at the very beginning of the planning process – for example, accounting for backhaul constraints, for access to fiber point of presence, or for access to electricity.

The points for small cells can be taken into account at the very beginning of the planning process, so that you never get that dichotomy between the planning process and deployment constraints that results from focusing solely on the technical

challenges, forgetting that at the end of the day, you are going to have to deploy the small cell. So we really provide a solution that is optimal from a radio payload standpoint while being one that can be deployed efficiently and quickly.

Frank Rayal. How is the planning for small cells different from that of macro cells?

Bernard Breton. In some ways it is the same, and in some ways it is completely different. The similarities are that, whether it is a small cell or a large cell, they are sharing the same spectrum and the same radio channel. Interference matters equally in small cells as it does in large cells. The same principles we learned while deploying macro networks and optimizing them to be increasingly more spectrally efficient as the traffic load increases. All those good lessons that we learned still apply.

Now, at the same time, they are entirely different, because the environment where you deploy the small cells is extremely urban and always below the building roofline. Also, the very objective of small cells is, in the majority of cases, not a coverage objective but a traffic offload objective from the macro network. The drivers as to why deploy small cells are different. While technically some of the good lessons that we learned still apply, the actual way of deploying small cells is quite different.

Frank Rayal. What are some of the features that you have built into the tool to help operators build small cells?

Bernard Breton. There are a lot. If we talk first of all about the engineering aspect of the small cell, we have a full 3D environment, full 3D realizations, and full 3D propagation environment, including the outdoor-to-indoor aspect. So we are looking at the network in a metro environment with manmade structures, because that is where the vast majority of the small cells will be deployed. In dense urban areas, more than 80% of traffic is indoors. So you have to understand what is going to be your indoor performance from your outdoor network. We call that the Metro Network Design Package. It is a package that runs within Planet. It provides essentially a full 3D environment of your network, including propagation and interference.

Now, on the financial aspect, or the rollout aspect of small cells, it is all about optimizing the process by which you select the right cells: automating the site selection while considering things like backhaul connectivity.

There are different strategies for backhaul. You can use fiber in areas where there is enough fiber, or non–line-of-sight backhaul, or daisy chain backhaul. Whatever your backhaul strategy, you need to consider that in your planning process. We have automated this process to be able to look at tens of thousands of small cells in the selection process.

Take, for example, the greater New York area: you can do a small-cell project that will be done in a matter of minutes or hours, as opposed to using traditional processes for large cells where, because of the level of engineering details, it would be

quite manual, and would lead to a much higher operational expenditure from a design standpoint.

Frank Rayal. What really differentiates you from the other products and solutions that are available on the market? What have you built differently, or how did you implement it differently, than the others?

Bernard Breton. There are multiple aspects of this. If we take a couple of steps back, I think one of the things that differentiate us is that we have been working on small-cell design for more than four years now. We have had multiple iterations on our small-cell product – and we did not get everything right from the get-go, make no mistake about that.

We have got that full 3D environment, which is quite unique in the market. We support all the technologies that are at play here – HSPA, HSPA+, LTE, full support for LTE-Advanced already, and all the flavors of Wi-Fi – all integrated on a single platform, so you can have a heterogeneous network strategy that goes beyond just small cells for a given technology.

Furthermore, we have full multiband support. We fully support antenna sharing. We fully support co-location, and so on. So we have the ability to model the network in the way it really is today.

We have always believed that accuracy matters. It matters as well in small cells. We have developed in the latest release of Mentum Planet a brand new propagation model, which focuses solely on

small cells. So those are the kinds of things that do certainly differentiate us.

Now, on the automation side, we provide the ability to automate a lot of the design practices into what we call a small-cell design tool, which allows you to do small-cell selection, interference mitigation, offload estimation, and traffic spreading, and to look at the backhaul, all together in one go.

Frank Rayal. There is an old idea in the wireless industry: bringing in performance measurements and data into the planning tools and being able to integrate and automate these processes. Is it reality now? Where are we on this?

Bernard Breton. It is a very good question. What you are talking about here is the rationale for the acquisition of Mentum last year by InfoVista. We are talking a little bit more here about the planning products suite, but let's not forget that InfoVista's roots are in performance management. So yes, we
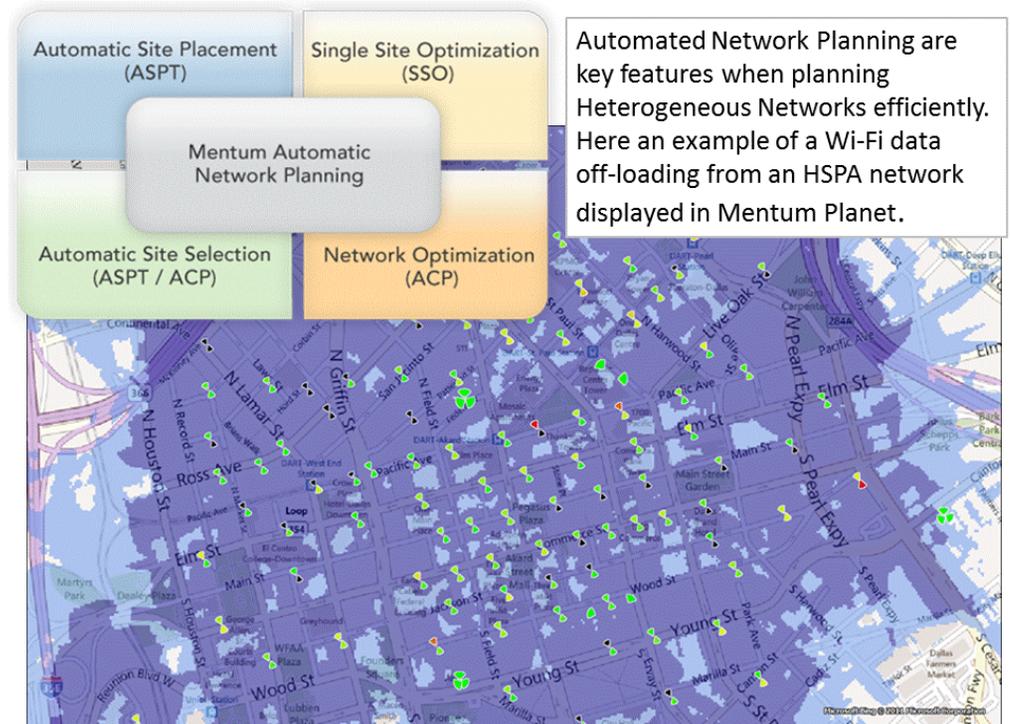

Figure 1. Automated network planning in Mentum Planet. Source: InfoVista

are in the process of delivering new products. They will be launched in the coming months.

Essentially, we are coming with an engineering edition of our performance management suite, to help operators better use performance data in the context of network planning and optimization. That will be true both for the next release of Mentum Planet as well as the next suite of VistaInsight.

Frank Rayal. You mentioned automation, and you mentioned also the scale of these networks being very large. That is where self-organizing network techniques come into play. InfoVista has a solution that is called the VistaSON. Can you tell us about this product?

Bernard Breton. We see SON as a journey. We do not see SON as a specific product, initially, with a certain number of features. So, indeed, we have a product called VistaSON with a certain number of capabilities that competes in the market, and it is a very solid solution out there. But we believe that network operators will take baby steps towards SON. The ecosystem globally is learning what SON can deliver to wireless operators.

We have a set of manual planning and optimization solutions in Mentum Planet. Additionally, we have quite a fair amount of automation built into Mentum Planet to shorten the cycle related to planning and optimization.

We also have something that is entirely autonomous in the context of VistaSON, which

reuses several of the technologies that we have in Mentum Planet and in the VistaInsight performance management product, but brings them together in a way that you can correlate data collection and understand where the issues are. VistaSON uses the very advanced analytics capabilities that we have in Mentum Planet, which allow us to look into the what-if scenarios that ultimately enable decision making, but in a way that is not frightening to the operator. This is because it is not like a black box that you just turn on and say: "We have enabled VistaSON."

VistaSON offers what we call a SON open scripting framework, which enables operators to decide specifically which workflows they are going to deploy and how they are going to deploy them. They can test the workflows offline with Mentum Planet, in many cases, to validate that the process and the approach that they are taking makes sense. Operators can do this in open-loop mode at the beginning and then move to full closed-loop with VistaSON. So we are allowing the benefits of full automation in SON, but without bringing all the risk with it.
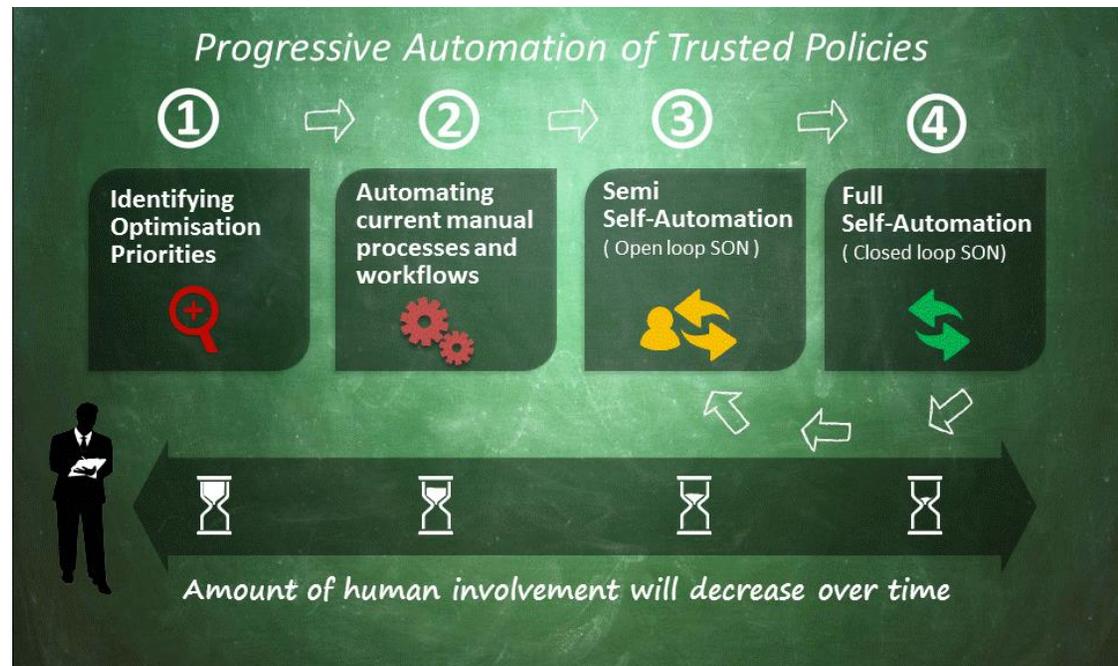

Figure 2. Network optimization automation, one step at a time toward SON. Source: InfoVista

Furthermore, we believe that this approach is extremely flexible when it comes to an operator managing a SON strategy that might not be the same for its entire network. If you think of an operator running a network in the US, the SON strategies that will be employed in Manhattan will be vastly different from the SON strategies that will be employed in rural Arkansas. So you don't want a black box approach. You want something that you can fine tune to your very own requirements. Your requirements for automation and self-organizing networks do vary according to where your network is and what the nature of your demand is.

Frank Rayal. When it comes to automation and the way these tools work, can you give us an example of what that means? An actual, real-life example of how the operator can use these tools to, let's say, optimize a certain part of the network?

Bernard Breton. I'll give you an example in designing a HetNet where you are starting to identify if there is a need for small-cell deployment. The way our solution works is that it would use the performance management data in order to understand the nature of your traffic. You can use call-trace data, social media data, and other things to build a good understanding of where your demand is. Then we take the demand as well as the macro network performance, and build a multidimensional matrix, called the resource utilization matrix, to understand where the radio resources are being utilized in the network. That is where you are going to get the

main benefits from small cells. Then we correlate that with the available sites, and we look at the potential amount of traffic offload that would be taken by the potential small-cell candidate sites.

All that process is fully automated. The outcome is a certain number of candidate sites that are selected, and where they should be placed in order to fulfill your objective. That is an example of where automation can bring you from A to Z in terms of doing a design for small cells in a target area.

Frank Rayal. There are different architectures of SON, including distributed and centralized, while most vendors are implementing hybrid architectures that will basically leverage the advantages of both. How does or where does your solution fit within this architecture?

Bernard Breton. To me, the debate about hybrid SON, centralized SON, or distributed SON might be a false debate. There are use cases that are very well suited to on-equipment implementation, so in the eNodeB itself. I also think this area will change drastically as we move into cloud RAN, and there'll be a lot of variation of that. It will be, by nature, extremely vendor dependent. We don't believe we play a role there.

We are a centralized SON player, and we believe that that is what SON is about. We consider distributed SON as a natural evolution of radio resource management: real-time radio resource management. There has always been radio

resource management; we are just getting more intelligent about it.

But centralized SON is different. It is about the network having a behavior – a global behavior – where you deal with patterns. So you will recognize patterns and you will make changes before the issues arise. It is totally different from a pure response-based system, which is what I believe we will see mostly in the distributed SON area.

Is there a need to bring the two together? Absolutely. The centralized SON solution must be aware of what is going on in the distributed SON environment. So you need a very good real-time connection to the equipment in order to measure all the KPIs that describe how the network is behaving. As long as you are doing that, I believe that those two streams will remain reasonably disconnected. I think – this is my view here – that we are going to see different suppliers because of the very inherent requirements. One is inherently vendor dependent. The other is inherently vendor independent. When you are talking about centralized SON, it is SON for the entire network. And a vast majority of the wireless operators have a multivendor strategy.

Frank Rayal. When it comes to SON, you mentioned it is a black box and there could be consequently some hesitation by the operators to trust this fully. What do you see on the trust factor?

Bernard Breton. First of all, I think it cannot be a black box. I think people would be afraid of it being a complete black box, because of the perception that there is a potential for things going sideways. Let's make sure that in SON, the O doesn't stand for "oscillating." Because a self-oscillating network is probably not the greatest network out there.

There is a reason why wireless operators have been very careful about making overly real-time changes in the network as a result of changes in traffic pattern: because unless the change can be reoccurring, all you'll do is almost always trail behind if you are always making changes as things come up.

So it is very important, as you are deploying your SON strategy, that you have the ability to truly have something that is flexible and will allow you to turn the knob and say: "You know what – in this kind of environment, the traffic is so dynamic that it makes no sense to even try to track it. We need to work, for example, on the basis of the big moving elements. So where are the real trends in traffic? What are the real trends in utilization?"

Also, be proactive. If you know you are going to have a baseball game at that time, there is no point trying to have a system that will discover that. Those are the kinds of things that can be done in order to make SON very capable, sometimes with very little complexity. It is much more complex to have a system that discovers hotspots when 50% of your hotspots might be easily predictable just by looking at a schedule, like a train schedule or a baseball game schedule.

Frank Rayal. Where do you see the operators today in terms of deploying SON features?

Bernard Breton. The vast majority are, at this stage, identifying what their strategy is going to be with regards to SON, and SON can be hundreds of use cases. There are plenty of things that can be automated. But the reality now is that the number of things that have been automated is still very limited and largely revolves around automatic neighbor selection. I see the large tier ones right now making their minds up in terms of where they are going. They are issuing RFPs – there have been at least 40 RFPs issued globally for SON solutions.

There were some deployments – some successful, some complete failures as well. So we are going to see the market evolve. I think that the jury is still out as to what is the real ROI of SON. But I think, at the same time, everybody understands that with the increased complexity of the network, this is a path that everybody will have to take, in the same way that SDN is going to happen. I think within the next two to three years, the market for SON will start to settle. We are going to see the leaders rise to the top, and we are going to see the standard way of actually deploying SON becoming more of a textbook approach as opposed to trial and error, which is what we are seeing today.

Now, there are some new wrinkles into the equation. I think cloud RAN brings a lot of benefits as well. We are going to see, just like in the fixed domain, that virtualization brings a lot of potential.

Frank Rayal. What do you see as the major drivers for cloud RAN?

Bernard Breton. There are many drivers for cloud RAN. In my view, the main one is moving towards very agile systems.

Take, for example, carrier aggregation or extra-wideband transmission: the more information you have about the radio environment, the more potential for coordination. Think about distributed SON in the context of a cloud RAN system, where you have a massive amount of information right at the eNodeB level that is running in the cloud. You have got potential for just-in-time capacity increases and for increased coordination. Increased coordination and agility are something that brings, potentially, a lot in extra capacity.

The technologies are there. The radio networks are becoming software networks. That is a fact. So the more we create a line between the actual transmission equipment and the intelligence of how the resources are utilized, the more potential there is for capacity to increase. I think that is where cloud RAN brings the most value.

Frank Rayal. I'd like to ask you about the interference between the macro-cell and small-cell layers. This has been a very critical issue that actually limits the benefit of small cells. What is your opinion on what is happening now in the field, and how do you address this issue in your solutions?

Bernard Breton. It really depends on what the strategy of an operator is – whether they are going to have enough to use dedicated spectrum for their small cells. In general, from a pure spectral-efficiency standpoint, that is not a really good idea. Coordination is far better, and that is where we see the 3GPP standard heading with eICIC and ABS.

With those kinds of technologies, we are seeing the potential for more coordination of interference between the multiple layers of the network, and that will improve the ability to deploy small cells in a way where you are going to get benefits without too much of the negative impact of having even more devices that are actively transmitting in the same spectrum.

Frank Rayal. Bernard, I would like to thank you for this informative and candid discussion.

And I would like to thank the viewers for joining us today in this conversation with Bernard Breton, Senior VP, Americas and APAC Sales, and CMO of InfoVista. This conversation is part of the Senza Fili report on the challenges of HetNet deployments and the latest solutions from the wireless ecosystem that will make HetNets a reality. The report can be downloaded from the Senza Fili website at**www.senzafiliconsulting.com**.

Acronyms

3D	Three-dimensional
3GPP	Third Generation Partnership Project
ABS	Almost-blank subframe
ACP	Automatic cell planning
APAC	Asia and Pacific
ASPT	Automatic site placement
CMO	Chief marketing officer
CSP	Communications service provider
eICIC	Enhanced intercell interference coordination
eNodeB	Evolved NodeB
HetNet	Heterogeneous network
HSPA	High speed packet access
HSPA+	Evolved HSPA
IT	Information technology
KPI	Key performance indicator
LTE	Long term evolution
MSP	Managed service provider
RAN	Radio access network
RF	Radio frequency
RFP	Request for proposals
ROI	Return on investment
SDN	Software-defined network
SON	Self-organizing network
SSO	Single-site optimization

About Senza Fili

Senza Fili provides advisory support on wireless data technologies and services. At Senza Fili we have in-depth expertise in financial modelling, market forecasts and research, white paper preparation, business plan support, RFP preparation and management, due diligence, and training. Our client base is international and spans the entire value chain: clients include wireline, fixed wireless and mobile operators, enterprises and other vertical players, vendors, system integrators, investors, regulators, and industry associations.

We provide a bridge between technologies and services, helping our clients assess established and emerging technologies, leverage these technologies to support new or existing services, and build solid, profitable business models. Independent advice, a strong quantitative orientation, and an international perspective are the hallmarks of our work. For additional information, visit www.senzafiliconsulting.com or contact us at info@senzafiliconsulting.com or +1 425 657 4991.

About the interviewer

Frank Rayal is founding partner at Xona Partners, a boutique management and technology advisory firm specializing in telecom, media, and technology. He is a telecom industry professional with more than 20 years of experience working with network operators and system vendors to develop and deploy innovative wireless solutions. Frank co-founded small-cell backhaul pioneer BLiNQ Networks. He held senior product management, marketing and business development positions at Ericsson, Redline, and Metawave. He holds a BS in electrical engineering from Case Western Reserve University, Cleveland, Ohio, and an MASc in electrical engineering and an MBA from the University of Toronto, Canada. He is a senior member of IEEE, and a member of Professional Engineers Ontario.