

# InDetail



## BEZVision

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**Philip Howard**

## Executive summary

BEZ Systems provides predictive performance management (PPM) for various databases and, with BEZVision, this extends to encompass the application that goes alongside that database as part of the corporate IT infrastructure.

Now, database performance management tools are available from various suppliers and a number of these extend beyond the database per se. However, BEZVision is different from all of these and complements rather than competes with them. What conventional performance management tools help you to do is to identify bottlenecks in your existing (extended) database environment so that you create or drop indexes, improve SQL access paths and so on. However, these are purely reactive. What BEZVision offers is the ability to forecast what will happen to performance if, for example, you add another server or implement a new application; and it will make recommendations about tuning on the basis of this forecast. Moreover, BEZVision will also predict the effect of implementing its recommendations so that you can try out different scenarios. In other words, BEZVision is a proactive tool that has a very important role to play in capacity and future planning, and in avoiding future performance issues.

To put this another way: BEZVision is used to help you understand the effects of (constant and increasing) change, on IT's ability to deliver timely service. Change can be either with respect to supply or demand: adding additional users next month, adding a new application, changing hardware infrastructure, going to Oracle RAC (real application clusters), consolidating servers, moving an application from test to production, and so on. PPM is about knowing beforehand how service (workloads) will be affected by these changes and what can be done to bring performance in line with business objectives.

### Fast facts

BEZVision is available for both Oracle and Teradata databases, along with Java-based applications. Although it is not the subject of this paper there is also a further product called BEZPlus for IBM DB2 UDB that uses the same predictive engine as BEZVision but is limited in its analysis to IBM's database environment.

### Key findings

In the opinion of Bloor Research the following represent the key facts of which prospective users should be aware:

- BEZVision collects performance data either itself or via third party products with which it integrates and uses this information in conjunction with its predictive engine to forecast future performance, either on the basis of continuing as is, or in the case of adding new resources or changing existing parameters.
- This predictive analysis allows informed choices to be made about investment decisions; where to make investments, whether to defer them, and so on. This can lead to significant cost savings and, therefore, return on investment.
- The technology used in the BEZ Predictive Engine results in very fast analyses; much, much faster than when using traditional methods.
- BEZVision is currently only available for Oracle and Teradata databases. The company plans to extend this to further database products in due course.
- BEZVision includes the effects of application servers, web servers and the operating system within its analysis.
- A Notification Engine is included to provide automated alerts in the event of performance thresholds (which are user defined) being breached or other anomalies occurring.
- There are a variety of graphical capabilities designed to illustrate BEZVision's various analytical capabilities. The product also supports metrics and dashboards.
- BEZ Systems only has offices in the United States. It has distributors (it is looking for more) in the UK and South America.

### The bottom line

We are not aware of any other product like BEZVision. Typically, its major competitor is to do nothing. In a world that is increasingly working in real-time, where service level agreements are becoming more stringent, and where pressures on the data centre are increasing, we do not believe that this is a viable option. We therefore regard BEZVision as a must-see option for Oracle and Teradata users.

## The product

### Product implementation

BEZVision is available for both Oracle and Teradata databases and it also collects data about, and makes predictions, that extend to the operating system and Java-based application (IBM, BEA and Oracle) servers, so that its predictive performance management capabilities extend beyond the database layer. Support for web servers (IIS and Apache) are candidates for future support. The company has a separate product, BEZPlus for IBM DB2 UDB, which provides comparable facilities for this database only. BEZ Systems tells us that it would take two to three months to port BEZVision to further databases, should there be sufficient demand, and it has plans to do this for both Microsoft SQL Server and DB2 in the future. The company is also planning to extend its support to messaging products such as WebSphere MQ, Oracle Streams and TIBCO.

The product has its own capabilities for capturing relevant performance data, using a remote agent-based approach, or it can use figures collected by products such as Symantec i3, HP OpenView, CA Wily Introscope or Oracle Enterprise Manager Grid Control. At the operating system level, BEZVision will monitor AIX, HP-UX, Linux Red Hat or SUSE), Windows and Solaris. The software itself requires either Windows or Linux as a platform and an instance of the Oracle database to run on as a repository.

### Product Architecture

The architecture of BEZVision is illustrated in Figure 1. As can be seen, BEZVision basically does three things: it analyses performance (based on configuration information and performance statistics), makes predictions and evaluations based on these details, and notifies the user about the results. Of these three, the first was discussed in the previous section with the exception that it is not simply statistics that are analysed but also configuration details, workload profiles and so on.

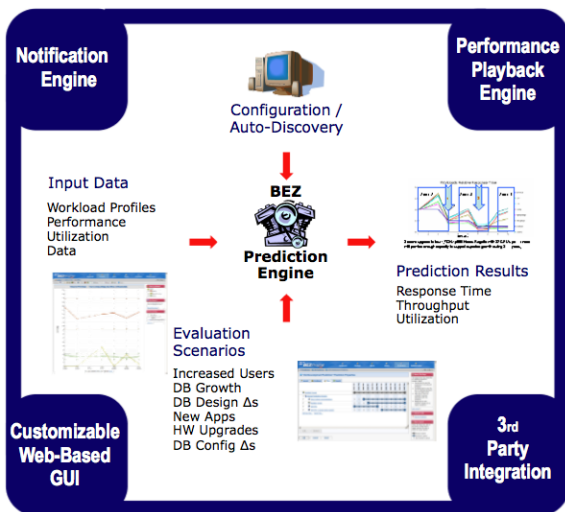


Figure 1: BEZVision architecture

Of the remaining two elements, we will delay any discussion on the presentation of results (which is important because the options available illustrate the use cases for which BEZVision is suitable) until after we have considered how

BEZVision actually works, which is the domain of the predictive engine.

The BEZ Prediction Engine is the key to understanding how BEZVision does what it does and, from a technical perspective, the engine uses an 'iterative calculated closed queuing network model'. This may need some explanation.

A graph is a series of nodes that is connected by lines (actually arcs). A network is a graph in which the arcs are directed (that is, information flows along the arc in one direction). A queuing network is one in which there are tasks, or jobs, that flow through the network. In other words, standard computer networks are queuing networks and a queuing network model is exactly that: a representation of a queuing network.

Now, for mathematical purposes (that is, modelling what goes on in a real network) there are two types of queuing network: an open network and a closed network. In an open network tasks are loaded onto the network, flow through it and then leave it, exactly as in real life. However, the problem with using this approach for simulating a real environment is that you have to continuously create input streams to feed into the network and, of course, this has to mirror the real world. This requires a lot of processing power, which is why it is typically done off-line, as a batch exercise, and it takes a long time (actually, this also applies to non-iterative closed networks).

In a closed network, on the other hand, nothing comes into or leaves the network: the duration of each task is infinite. The problem with this approach (which is mathematically richer) is that it doesn't reflect the real world, because things don't last forever and new tasks do enter the network. What BEZ Systems has done is to build algorithms that allow a closed network to be iteratively refreshed. Thus BEZVision, which runs on its own server, is continually active, with its model of the environment being incrementally updated on a regular (typically hourly) basis.

The long and short of all this is that the BEZ engine performs these predictions and simulations in a matter of, literally, seconds. The time to run such simulations using conventional techniques is more usually measured in days and, given then you may have to run multiple simulations before arriving at an optimal solution, this means that BEZVision can help you resolve database performance issues in a few hours that would otherwise take weeks or even months.

### Analysis

In terms of analysis, at a high level the product works from the perspective of a business view. Thus you might look at the performance load (either in terms of CPU consumption or response times) that different sales divisions were placing on the system, how much work the finance department was doing and so on, and you can see how large these are with respect to one another and which is growing, shrinking or standing still. You can then drill down into any group to as much detail as you like, ultimately down to the level of individual SQL statements, tables or joins. The business workloads you define can be filtered by any combination of machine, user, program or module so that

## The product

you can investigate at as fine a level of granularity as you like; and you can examine the data either on the basis of such workloads or by database instance.

Based on these analyses, BEZVision can recognise trends (as it stores historical performance information) and make predictions such as when a problem may occur. For example, it might forecast that on current growth rates the response time to the French sales division will exceed service level agreements in, say, July. Suppose that this is the case, then the first thing that BEZVision will do is to send an alert to the DBA. These are sent out by the Notification Engine via email and they are generated (automatically) against user-defined thresholds that are defined against three audit classes; these being abnormal trends, performance objective breaches and actual versus expected variations. Note that unlike conventional performance management tools, which alert you to problems that have happened, BEZVision alerts you to problems that are predicted to occur in the future.

Secondly, the software will isolate the main cause of the problem (CPU, disk, memory and so forth) and, thirdly, it will recommend a potential solution such as to create a new index, create a materialised view, or add more memory. Further, BEZVision can predict the result of making these changes and re-calculate trend lines based on such changes. This is where the predictive element of the product comes in, and it supports features that enable trend analysis, workload forecasting, and the examination of potential changes such as server consolidations, configuration adjustments and the addition of new capacity. This analysis can be very fine-grained: for example, you can examine the impact of making software parameter changes to JVM thread pools or of making memory pool adjustments.

Use cases

In terms of how it works the foregoing may give you a reasonable idea of what BEZVision is doing. However, it does not really give a full flavour of the potential uses of the product. To do that we really need to look at use cases, for which Figure 2 provides an illustration.

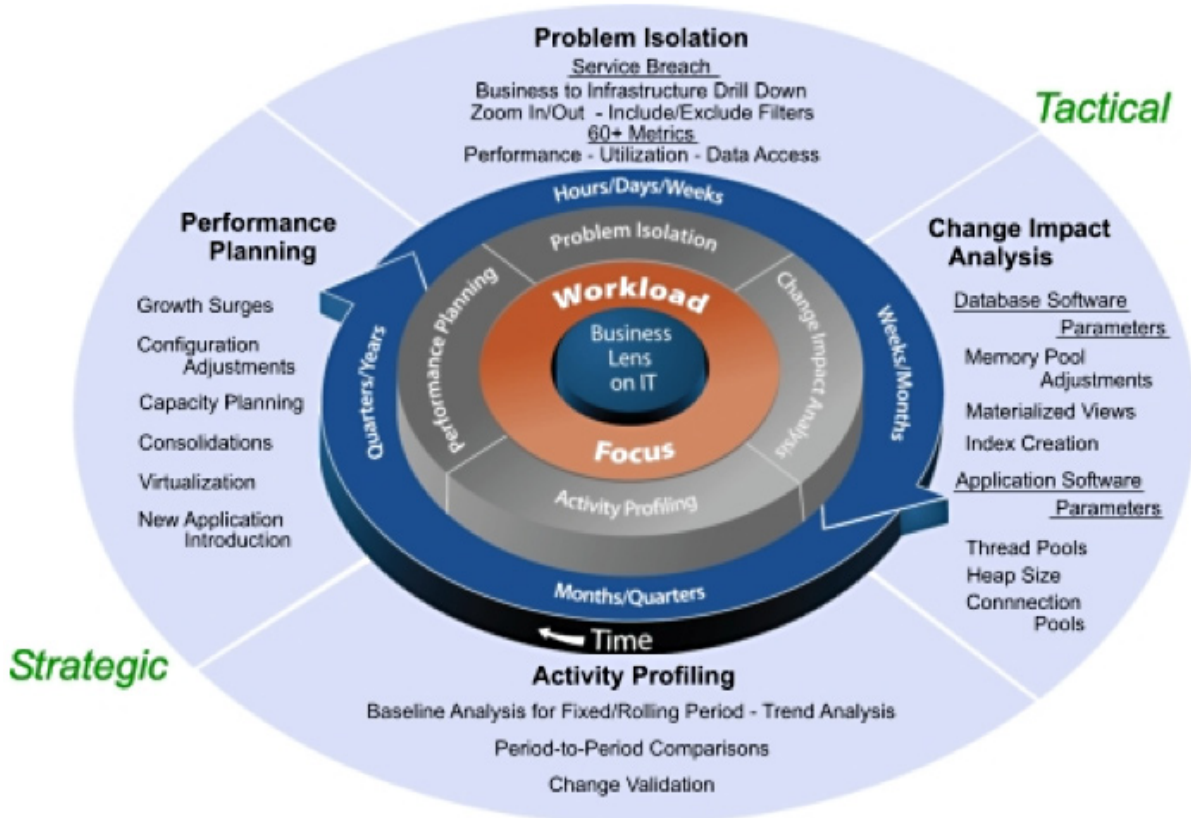


Figure 2: Use cases for BEZVision

It may be useful to provide an actual example of the sort of output that BEZVision can produce and how it can be used. Thus Figure 3 shows the product's analysis playback capabilities, here comparing historical metrics by workload (in this case by patient, physician and so on) over a defined (any) historical time period. Figure 4, on the other hand, takes the same environment and projects what will happen if there is a 30% workload growth over the next 12 months. The required response time is a steady (horizontal dotted line) of 40 seconds but, as can be seen (blue line), the predicted result in the patient cluster is that this performance target will not be met by a long way. The physician cluster will also be marginally exceeding expectations.

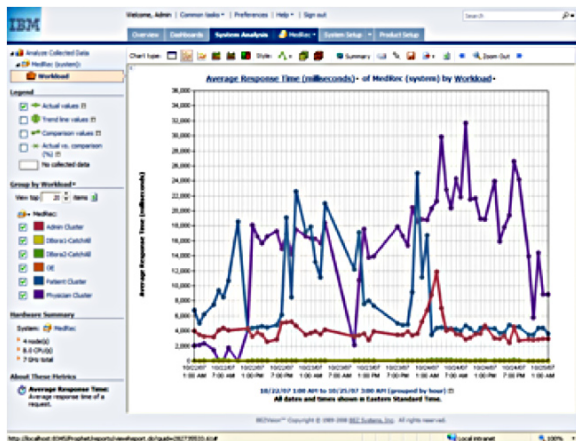


Figure 3: Analysis playback



Figure 4: Analysis playback with projected 30% increase in load

## Use cases

So, if this is the situation you are in, what do you do about it? In figures 5 and 6, the hospital evaluates two upgrade options, in the first case a hardware upgrade to an IBM BladeCenter J12 and in the second case by also adding new indexes to the database. Note that in both of these screenshots we have increased the scale on the vertical axis, using the product's zoom capabilities. In Figure 6, the timelines with circles on them show when the upgrades are planned: indexes in August and hardware in October.

As can be seen, simply introducing new hardware resolves the patient issue but both physician and administrative clusters are close to or over the target performance. Introducing indexes as well fixes the administrative problem, leaving just the physicians to deal with. So you can see that iteratively trying different approaches allows you to see what will work best for your environment.

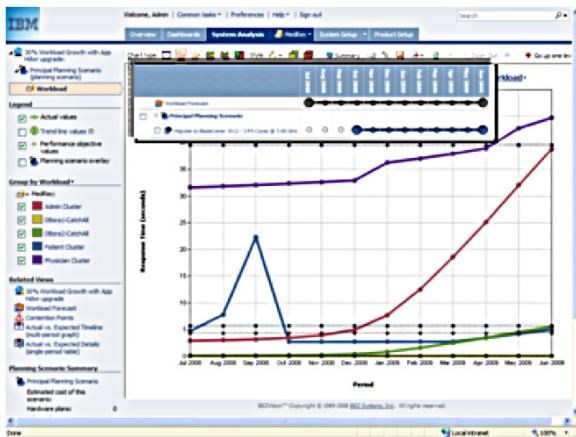


Figure 5: Upgrade option 1

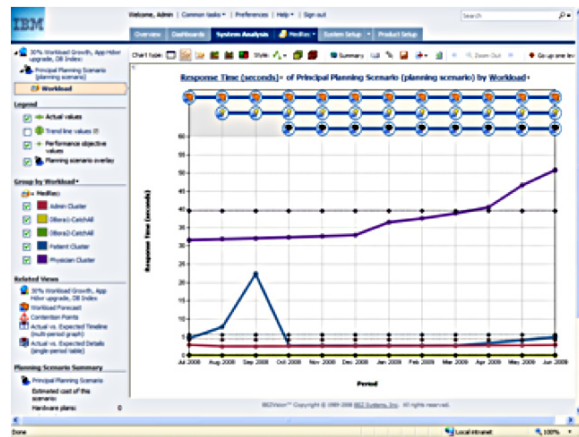


Figure 6: Upgrade option 2

## The vendor

### Vendor background

BEZ Systems was founded in 1983, originally as a professional services firm. It introduced its first product in 1992. To date it has more than 200 customers within the Fortune 500. The company is private and funded by venture capital. It has offices in Boston (headquarters) and Chicago. Outside North America it has a partner that acts as a distributor in the UK and another in South America. It is actively looking for suitable additional partners in other geographies. This is not easy because there are not that many companies with expertise in performance management so perhaps the company should consider opening its own offices outside the United States. It might also be useful to move beyond merely integrating with traditional database performance management vendors (CA, Symantec and so on) to forming partnerships with these companies with a view to their reselling the BEZ Systems' products.

In addition to BEZVision, the company also offers BEZPlus for DB2 UDB, which utilises the same predictive engine as BEZVision but which is limited to database analysis only. In addition, the company also offers consulting services that it has bundled into what it calls Pro-Service PAKS. Several of these are available to support common scenarios such as database and hardware platform justification, new application certification, capacity planning (various options) and so on.

BEZ Systems web address: [www.bez.com](http://www.bez.com)

## Summary

### Market development

The concept of using modeling to help to solve capacity issues is not new but previous generations of technology have been time consuming and expensive and, in any case, these approaches were designed for a world in which the pace of change was much slower and capacity planning was something you only did on a periodic basis, perhaps once every six months or once a year. Such 'batch' approaches are no longer pertinent.

As a result, a new generation of products is starting to emerge that builds on the lessons of the past but takes into account the near real-time nature of modern computing environments and which mandates a similar approach to performance management and, especially, PPM.

In terms of being able to predict and resolve potential performance management issues there are two basic types of technology that can be used: event correlation and analytic models. The former uses pattern recognition to examine historical data, correlate events and then predict the progression of events. In other words, if event A happens and event B happens, then there is a probability that event C will take place. The timeframe is fairly short but this approach provides a significant warning that you may 'run off the road' before C actually happens.

Analytic modelling, the approach taken by BEZ Systems, also examines historical data from multiple sources but then it aggregates individual transactions into workloads and builds performance models which approximate an application's unique performance characteristics. These models can then predict how an application will perform in the future. The prediction timeframe can span anywhere from hours up to years. A powerful feature of these performance models is the ability to adapt to change. In particular, you can make 'what-if' predictions. For example, analytic models can warn you of a potential service breach that may not occur for months into the future, what the cause is, what you can do about it and then test various remedial actions before committing resources to any of them. This allows you to choose the best possible solution without having to react to a serious performance problem that is threatening to hamper the business.

### Conclusion

BEZ Systems' biggest obstacles are, firstly, that it is relatively unknown and, secondly, that it is in a market of one. Of course the latter is also an advantage, but it means that the company has been obliged to create its own market. Nevertheless, as indicated in the previous section, we expect to see a whole class of products emerging in this space so it might be more correct to describe BEZ Systems as 'first in'.

The company's longevity and its penetration of the world's biggest companies proves that it has had significant success, at least in the United States, but it is less well known overseas. Indeed, we suspect that many organisations that could benefit from the company's solutions have yet to hear about them, which means that a greater attention to marketing is required. Fortunately, the company has recognised this fact, raising a further round of venture capital funding earlier in 2008 to support just such activities. The future therefore looks rosy for BEZ Systems and we expect the company to become less of a well hidden secret in the months ahead and more widely recognised as a purveyor of market-leading technology.

### Further Information

Further information about this subject is available from <http://www.bloor-research.com/update/972>

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**Philip Howard**  
Research Director - Data

Philip started in the computer industry way back in 1973 and has variously worked as a systems analyst, programmer and salesperson, as well as in marketing and product management, for a variety of companies including GEC Marconi, GPT, Philips Data Systems, Raytheon and NCR.

After a quarter of a century of not being his own boss Philip set up what is now P3ST (Wordsmiths) Ltd in 1992 and his first client was Bloor Research (then ButlerBloor), with Philip working for the company as an associate analyst. His relationship with Bloor Research has continued since that time and he is now Research Director. His practice area encompasses anything to do with data and content and he has five further analysts working with him in this area. While maintaining an overview of the whole space Philip himself specialises in databases, data management, data integration, data quality, data federation, master data management, data governance and data warehousing. He also has an interest in event stream/complex event processing.

In addition to the numerous reports Philip has written on behalf of Bloor Research, Philip also contributes regularly to [www.IT-Director.com](http://www.IT-Director.com) and [www.IT-Analysis.com](http://www.IT-Analysis.com) and was previously the editor of both "Application Development News" and "Operating System News" on behalf of Cambridge Market Intelligence (CMI). He has also contributed to various magazines and published a number of reports published by companies such as CMI and The Financial Times.

Away from work, Philip's primary leisure activities are canal boats, skiing, playing Bridge (at which he is a Life Master) and walking the dog.

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