Interview with Klaus Heumann, Founder and CEO, Biomax Informatics

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Your interest in bioinformatics has run though your academic career and now into your business career as CEO and founder of Biomax Informatics; what was your vision for the company and how successful have you been so far in achieving your aims?

When I founded the company 10 years ago, with Professor Frishman and Professor Mewes, there was no bio-informatics industry: that is, although the academia was in place, there were no companies. There was a need to take this academic experience bring it to the biotech industry. We started a contract programming and service annotation company; it came out of a classical biotech company that was involved in the yeast genome-sequencing project, so we already had good links to the industry. Biomax Informatics began as a bootstrap company in that there was no outside cash, no investment, only customers. At the time this was fairly unusual, but in retrospect it was clearly a good decision.

Once new technologies emerged and there was need for the next stage of innovation, we decided to take some investment capital, and instead of being a genomics focused company, the company made the transition from a focus on the genotype to the phenotype, meaning much more work on medical data (such as the oncology baseand knowledge bases for specific disease types). The business was no longer focused on contract programming, but instead became a product company. The main reason for the move was that the heterogeneity of applications in the life sciences is very difficult to manage from an informatics point of view. The key challenge was to formulate a

software product which is standardised and replicable both from a business and a customer point of view. The idea was to have stability but to maintain a high level of flexibility, so that it is possible to deal with diverse aspects of the business, from oncology to classical biotech companies reaching as far as the food industry. This has been the company's main accomplishment; Biomax now has customers in all major sectors of the industry, national and international, and a set of successful R&D projects, which are funded by the EU.

The industry is being driven on the computational side by automation: companies want to produce more and more data – so sequencing is actually the classic paradigm. Comparing the cost per base situation 10 years ago with the situation today, the development is dramatic, and the same is the case for pretty much any automated technology. People produce data and write tools to extract information from it; in doing so they pile on more and more information, whilst at the same time the gap between this information and the domain specific utility widens. The challenge is therefore to close the gap between the information space and the domain specific utility. Biomax's approach is to do this by knowledge management. Instead of following the data and information explosion, the company approaches from a software point of view. Biomax's products can actually formulate this, in the language of the scientist. The product is an application-dependent data model, which can be configured without knowledge of computer science. All aspects of the system are then derived from that data model, like 'query' language (the recording, importing, exporting, and the access to the analytical tools).

We see this as a shift in paradigm: it's not following the data stream, but following problem streams instead. At the same time, from a technology point of view, the principles of agile software programming can be transferred to agile solution building. Creating solutions in this way is a highly agile and interactive process, in which one can formulate a question by the data model, populate it, and connect it. It is these types of queries which are constantly challenging us.

Of course it is easy to miss something, and the data model might need to be extended. At Biomax it is possible to do this in real time; the cycle happens over a period of days, weeks, instead of the months or even years which a classical software development process would require. There is a much faster feedback loop and as a result it is easier to incorporate the customer or end user into the boat. Every solution is completely different, but each one is based on the same fundamental technology.

Biomax Informatics really prides itself in working with end users to improve the quality of the experience and of the product. How has that helped the company to develop over the years and how much of a role in the strategy does that play today?

As a service provider that addresses a broad spectrum of industries, it is impossible to be an expert in all of these fields. It is critical to work with customers in a highly collaborative way. One of our most important principles, in light of Biomax's technology, involves allowing customers and stakeholders to test-drive the system, so that after three months they can learn drive the car by themselves; they can fuel it with whatever they want to, although some continue to get fuel from Biomax: they can rely upon the service provider but are not dependent on it.

Although Biomax Informatics is dedicated to working across the life sciences we see that a lot of your customers come from the pharmaceutical sector. What services does Biomax Informatics offer to this industry and what do you think makes the company the partner of choice for clients such as Bayer-Schering, Roche and Sanofi-Aventis?

In terms of software, the company's key offering is the technology, which enables internal knowledge management and accelerates the R&D process. On the services side, Biomax provides customer annotation services on genomics and specific disease areas. It is important that when you allow for semantic data integration of knowledge management – that not only is the technology side of the software taken care of, but that there is also semantic coherence in terms of content. The service provider's expertise must be transferred to the customer in order to make full use of the system.

As a software provider, I imagine one of the difficulties is to deal with companies upstream and downstream. How do you deal with this, and what are you doing to make the process as efficient as possible?

Biomax's technology adapts very well to existing infrastructures, both in terms of hardware environment and software and tools environments. Many of the company's customers use the technology, on top of and alongside their existing infrastructure. There a two main advantages of this: firstly it is not a replacement technology it is simply taking existing infrastructures to the next level; and secondly if a client does want to carry out certain types of migration, they can do so in a very robust way.

How will Biomax Informatics grow in the years to come? Are you more focused on enlarging your client base, or looking to offer more services, or is it going to be a mix of the two?

The company is very happy with the track it is taking. Biomax has a solid, robust and happy customer base, so it would be looking to grow these customers and expand into other companies within their industries. This will no doubt keep us very busy. Due to the nature of the technology, the company is focused on 'enabling' not trying to do everything itself. This also helps Biomax's

customers to benefit from the developments of the market in general. The company has created a community platform where there is an active interchange of software extensions, so that tools are available to the customer base even if the tools do not actually come from Biomax.

What are the main opportunities presented to Biomax informatics by being based in Germany?

The fact that the company is based here in Munich by one of the largest biotech clusters, not only in Germany but also in Europe, has been a great advantage. The area has a huge pool of top-level young experts because the University in Munich boasts one of the largest bioinformatics curricula. Therefore, there are many young PhD students working on a lot of our projects.

You mentioned that as Biomax informatics was moving into the next level of its development, you were looking for financial investment in the company. How much of a struggle was it for you at that stage, and how do you think that compares to the situation today for start up companies in Germany looking to find investment?

When we were looking for investment four or five years ago it was okay; today however, it’s probably close to impossible, particularly for start-ups and small companies and especially here in Germany. This is going to be problem for the next 10 years because the companies that are out there have established themselves, and operate on a revenue basis like Biomax does, so it will be very difficult for innovation to compete, The financing will simply not be available. I expect that there will be a dip in about 12 years time since there are not enough new and creative ideas coming in.

Does this situation affect Biomax Informatics’ growth strategies, in terms of seeing these young companies that are struggling for investment and perhaps seeing opportunities for taking hold of new technologies?

It means that Biomax can be fairly confident that the company will have very little competition, since nobody can get the money and customers in a short enough length of time, particularly alongside the company’s own growth. This may be very good for Biomax, but is ultimately not good for the industry as a whole because you need innovation.

We’ve talked about your expectations for the growth of Biomax Informatics. But if we were to come back in 5 years, what would you really like to have achieved in that time?

Over the next 5 years, the company hopes to continue to grow its customer base, and have Biomax rated highly by the large players who use its technology. The business can then start to move into new areas, such as that of synthetic biology. One of the most exciting areas that Biomax is hoping

to get into is the converging of systems biology and synthetic biology. This will be very interesting from a knowledge management point of view because systems biology has a mechanistic element, in terms of how equations work and the simulations (Biomax already does play a role in mapping that to biology). However, with synthetic biology even more of an engineering approach is required, trying to design and build things from scratch. It is already clear that knowledge management is going to be absolutely critical in this field because any good, rational design needs to look at the main specific utility, (i.e. What do I want to accomplish? What do I have as material? How can I use it most sensibly based on past experience?) This kind of technology is only just beginning to have an impact, most of which is in classical biotech at the moment, but there are going to be applications in the medical space over the next 5 to 10 years.

You've been here for 10 years and you started the company with a dream. You have clearly had a lot of success, do you think this is associated with a particular management style?

Biomax is not as young a company in terms of employees as it was 10 years ago, but two thirds of the company has PhDs and so is very science driven: our employees actively participate in the scientific community. Biomax is a tech company, so there is a highly collaborative work environment, and a flat hierarchy. It is a very interesting place to be and there is a lot of freedom to drive and design things, but it's also very demanding. Therefore a person needs to have a mixture of creativity and passion, and an ability to get stuff done.

Final message:

It's good to look at the technology drive in companies, but at the same time it is necessary to focus on the software. Although they are important, it's not all about the big IT and classical IT providers, but when it comes to relating and bringing impact to their business, the smaller and more agile companies tend to be the more attractive partners because they are faster and can adapt to a customer's needs more effectively. This is all going to be much more important in the future than it has been in the past.

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