

Chromatography Today Help Desk

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It sounds a great idea but...

Introduction

How many times as scientists have we looked at new technology from a distance and thought how exciting that technology is, but always at a safe distance hoping that it will not impact us. In this edition of Chromatography Today we are looking at new structures and concepts within the field of chromatography and sample preparation. We are often drawn to new disruptive developments in our field and discuss with great enthusiasm the impact that the introduction of a new technology will have on the world of analytical science. This presents an interesting challenge since not all of the technology that is so warmly discussed by excitable scientists actually makes it into the mainstream laboratory and understanding why this is the case may help scientists bring new technologies into organisations in a more effective manner. Interestingly it is not always the technology that fails but instead the approach that is employed by vendors and purchasers that is the downfall of the technology and in this edition of the Chromatography Today help desk, in a move away from a technical article, the concept of how to introduce new, disruptive technology into the market place will be discussed and the implications that this can have on the separation science.

The concepts for the discussion are taken from two sources. The first is an excellent book on the topic, 'Crossing the Chasm' [1] and all lab users should be encouraged to read this as it may help to ensure success when the next new 'shiny toy' is purchased. The second concept is based on the Kübler-Ross change curve, originally assigned to the different phases of grief, but can also be readily applied to the introduction of new concepts or new technologies [2].

In order to better understand why new differentiated technology is not always readily incorporated into the mainstream laboratory it is first necessary to get a better understanding of the different types of lab users that exist within the scientific field. It is important to have different personalities within an organisation, but it is also important to understand what the roles of these individuals are in bringing in new technologies, whether that be based on new analytical concepts of a new chromatographic structures.

Within any organisation there are the technology enthusiasts and visionaries whose role is to bring new technology in to an organisation. People of this genre are looking at ways to dramatically improve the performance of the mainstream laboratory by bringing in new concepts. They will be very much focussed on the concept and perhaps not so much on the detail of the product offering. This poses a problem for the vendor as will be discussed later in this article. The visionaries represent a relatively small proportion of the scientific workforce, typically 5-10%.

A much larger proportion of the laboratory population is made up from the individuals that have a routine job to do and where performance is governed not by the number of innovations that are introduced but instead by the number of samples that are analysed. By the very nature of the work that these scientists perform they tend to be very pragmatic in their approach, and the fear of not being able to deliver the sample analysis drives their thinking process. This type of laboratory scientist comprises the majority of lab staff and are referred to as early and late majority. Thus, change is not always seen as a good thing, as invariably it will impact on productivity. The number of people in each group is often presented as a population bell curve and unlike most distribution curves where there tends to be a gradual change from one group to another this is not the case in this example and there exists a chasm between the visionaries and the mainstream lab users in terms of the way they treat new technology and consequently the manner in which they should be marketed and sold to.

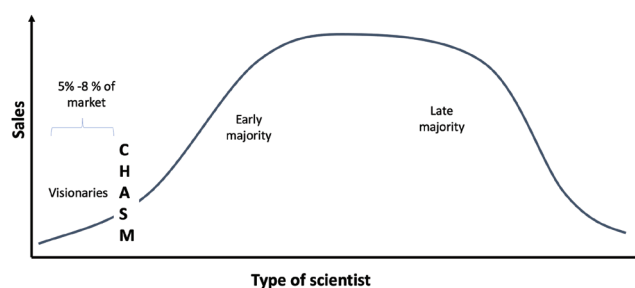


Figure 1: The distribution of scientists can be broadly based on a Gaussian curve, however, there exists a chasm between the visionaries and the majority of the more pragmatic laboratory users.

This presents a challenge to the vendor of disruptive technology as they will typically be targeting the visionaries initially, since they will be more aligned in their thinking process to the concepts of introducing a new technology, and these will typically be the people that are more accessible within an organisation. Finally, the visionaries will act as the gatekeepers to the rest of the organisation, so it is important to be able to understand how to sell to these individuals. From a marketing perspective, the approach to generating sales is to focus on the innovative aspects of the technology. If the technology is not quite that robust yet is not so important as ensuring that the concept of the technology can be shown to work. Thus, when new disruptive technology is launched it will often have buzzwords such as 'revolutionary', 'exciting', and 'novel' associated with it. For the more

pragmatic majority of lab users these words strike fear into their being as, these terms can often be associated with a large activation energy and a drop off in performance. Thus, for the pragmatic majority terms such as 'reliable', 'robust', 'industry standard' are words that they seek comfort in as these technologies will not cause a potential drop off in performance. The approach to the marketing and selling of technologies to these two different classes of laboratory user has to be very different to be effective.

The classical approach to sales has always been to try to sell as many items as possible, as quickly as possible, however with disruptive technologies this is not the always the correct approach, since it will ultimately end up with many disappointed customers and the new instrumentation gathering dust on the back of a shelf somewhere. Initially, as the product is launched, there will be substantial interest from the visionaries and these population group will be looking to prove that the concept can be applied within the wider laboratory. The potential sales growth can be quite fast in these early days, which can often lead to organisations over-estimating the projected revenue figures, since ultimately the technology has to be bought by the pragmatic majority and the approach to selling has to be very different, as was mentioned previously.

In order to move from a marketing approach that is successful with the visionaries to one that will drive revenue growth into the early and late majority market, the approach has to change. Instead of selling an exciting new technology to as many people as possible, the vendor has to look at the whole package that is being sold. Thus, it is not just the technology, but now the support teams, the packing, the way the technology interfaces with other technology has substantially more significance. Figure 2 gives an overview of what the whole product or solution should be. The terms solution becomes readily applied, as this suggests that the laboratory user has a significant problem, and the solution can resolve this. The other aspect that needs to be carefully considered is who to sell and market to, and so a very focussed approach is made to the selling the solution, with the efforts concentrating on a very few customers to ensure that a beach head is obtained within the early majority. Identifying the initial customers is critical. As already stated the pragmatic majority of laboratory users are not keen on new exciting technology and instead prefer to use tried and trusted technology which has been shown to work time after time. So, the vendor marketing teams now need to focus on becoming the market leader in a very small market, as this will allow other potential customers to take up the technology with limited risk. This requires discipline, if too many customers are targeted at this point, there will not be the support structure in place and any developments of the final solution may get diluted with too many inputs on what needs to be changed. Focussing on a few key customers means that a defined solution for a particular market can be made and crucially the technology will be seen as being the leading standard in a particular market. The size of the market can be very small, even to the point of one laboratory in one organisation. The key to success is for the vendor to dominate that market space.

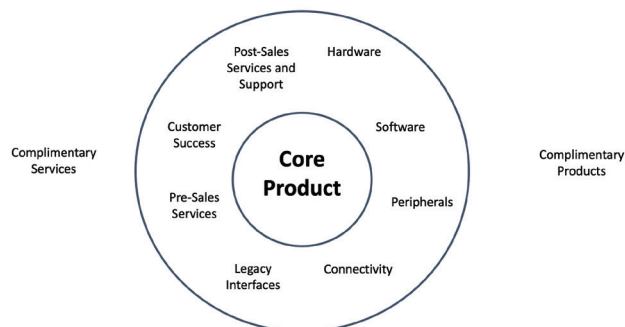


Figure 2: Understanding that a new core technology or concept is not everything that is being sold is an important concept. This figure shows some of the other considerations to ensure that new technology is sold successfully.

Once the vendor has taken control of one market, then the vendor can look to break into other markets, using a similar approach. This typically results in a very fast growth of sales as the new markets take up the safe reliable solution very readily. Eventually this will result with the new technology becoming the mainstream technology, and within the chromatography environment there are quite a few examples of new technologies that have been introduced very successfully using a similar approach to this, including UHPLC and solid core silica column packing materials. There are, unfortunately, many technologies where the implementation has not been so successful.

The discussion so far has looked at the perspective from the vendor, however it is also important that the separation scientist's perspective is also considered within this. At the start of the article the terminology disruptive was employed and it is important that an understanding of what disruptive means in the context of a chromatographer, since it is feasible that a disruptive technology for one organisation may no longer be seen as that by another organisation. This is another area where the end user has to be aware of the impact that new technology will have. Thus, if the product requires a change in the behaviour, skillset or a process within the laboratory then it can be classified as disruptive. If one or more of these changes is very large then the technology can be seen to be highly disruptive.

For a laboratory user the implementation of new technology can be very daunting. There will have been some form of investment by the organisation into the new technology and the organisation will be looking to get that investment back in some manner, which will put a reasonable amount of pressure on the laboratory scientists to deliver success. How to deal with the change as the new technology, or indeed a new process is introduced, is very important as is understanding the different stages that an individual may go through.

Elisabeth Kübler-Ross was a Swiss-American psychiatrist, a pioneer in near-death studies, and author of the internationally best-selling book, *On Death and Dying* (1969), where she first discussed her theory of the five stages of grief, also known as the 'Kübler-Ross model' [2]. This same model has been readily applied to change management. Some critics state that it is too simplistic, however the basic concepts are very useful to giving an insight into what to expect. Figure 3 shows what the model looks like.

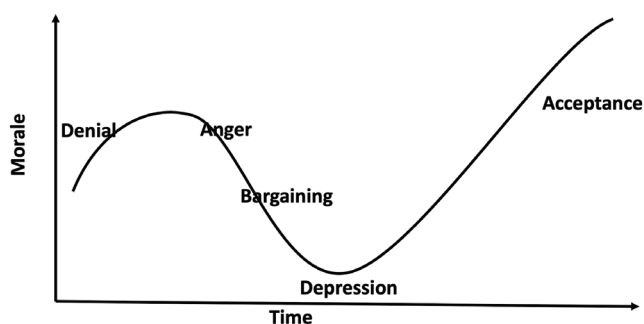


Figure 3: The Kübler-Ross model showing the impact of change associated with the introduction of new technology.

There are five stages to the Kübler-Ross model, with each one discussed below.

Denial

The denial phase is usually a temporary defence that gives us time to absorb news of change before moving on to other stages. Often with the introduction of new disruptive technology the lab user can be left with feelings of numbness and shock, as the task of bringing in the technology seems overwhelming, and so there is a tendency at this initial stage to not believe that the change is happening.

Anger

Eventually it will be realised that the introduction of the new technology is real, and this may result in the denial turning to anger. Now we get angry and look to blame someone or something for making this happen to us. There will tend to be a focus for the anger, the person who brought in the new technology, but this may not always be the case. This can result in the scientist being more irritable towards colleagues.

Bargaining

The bargaining phase is an attempt to postpone what is inevitable. Bargaining can also be seen as a potential route out of having to use the technology, with the benefits of the older technology often being exaggerated above its capabilities at this point.

Depression

Eventually, it hits the scientists that the bargaining is not going to work and the reality of having to introduce the new technology hits home. This has the potential to move people towards a sad state, feeling down and depressed with low energy. People dealing with change at work may reach a point of feeling demotivated and uncertain about their future.

Acceptance

The final stage is acceptance, as the scientist realises that fighting the change is not going to make it go away, they move into a stage of acceptance. It is not a happy space, but rather a resigned attitude towards the change, and a sense that they must get on with it. Within this frame a scientist can learn a lot about themselves as they start to work outside of their normal comfort zones.

It should be noted that the curve is not linear in the sense that one stage follows the next, as it is very feasible to move backwards as well as forwards when implementing change. It should also be noted that hope is also an important thread that runs throughout the whole process. This hope is the belief that there will be a positive end to the change and that there is some meaning that will eventually be learned from the experience. It can be seen as an important indicator of our ability to successfully navigate change. Even in the most difficult circumstances there is an opportunity for growth and learning.

Conclusion

As a community, separation scientists will have an interest in what new technologies are being introduced and the potential impact that this could have on the industry. The introduction of the new technology has to be done very carefully. There can be a tendency of 'NIMBY' (not in my back yard) as it can be very disruptive to the routine sample analysis and initially not always in a beneficial manner. The vendor has a critical role to support the chromatographer, ensuring that the separation scientist is buying a fully working solution that will have minimal impact on their day to day job. If the scientist is left to fend for themselves at this point, the technology will probably die. It is also important that the scientist sees the positive impact that the technology will have at the end of the journey. Working together is critical for introducing new technology and concepts in an efficient and successful manner. With all change there will be disruption but maintaining hope, that the final destination will be better, is something that as scientists we should embrace, and perhaps no more so than in an age where we are seeing substantial change. Let us hope that the destination will be reached soon and that we will be in a better place.

References

1. "Crossing the Chasm", 3rd Edition: Geoffrey A. Moore, Collins Business Essentials (2014)
2. "On death and dying", Elisabeth Kübler-Ross, Simon & Schuster Australia (1969)