Swanepoel, Marinus

1996-06

The Digital Library: The Next Sigmoid Curve of the Information Profession

THE DIGITAL LIBRARY: THE NEXT SIGMOID CURVE OF THE INFORMATION PROFESSION

Marinus Swanepoel, Director Library Services
Technikon Pretoria, Republic of South Africa

---

1. INTRODUCTION

There is no reason to believe that libraries, its information carrier as well as its services, and the information profession in general, does not follow this curve.

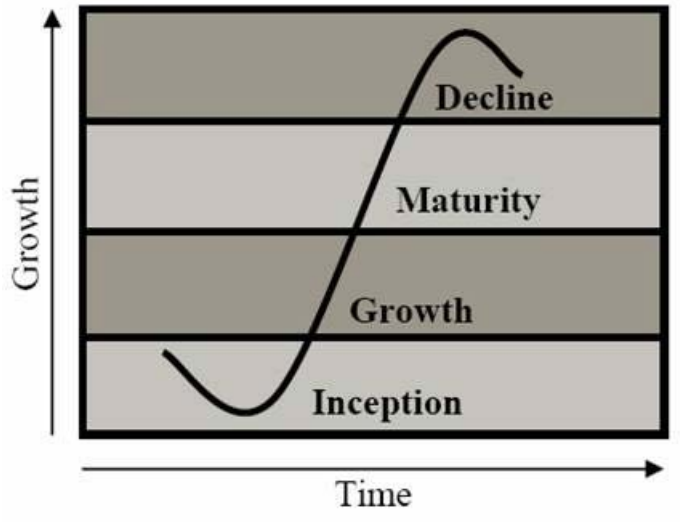

Figure 1.

Looked at from a fatalistic point of view, the Sigmoid Curve paints a depressing picture of the inevitable demise or end of all phenomena, living and dead. Luckily, there is life beyond the curve.

2. THE SIGMOID CURVE

2.1 STARTING THE NEW CURVE

The secret to constant growth is to start a new Sigmoid Curve before the first one peters out. The right place to start the next curve is at the point (X) (see figure 2) where there is still the time, as well as the resources and the energy, to get the new curve through its initial explorations and floundering before the first curve begins to dip downwards towards its ultimate demise.

At first glance this may be seen as very obvious, and it is, except for the fact that at this point of an organization or product's life all indicators are flashing green. Dreams

are being fulfilled, money is rolling in and the last thing anyone wants to think about is to stick a spanner in the works by proposing change. This is because at point X the product/organization/service has reached maturity and the lean years are now a thing of the past. The fruits of the investment are now being harvested.

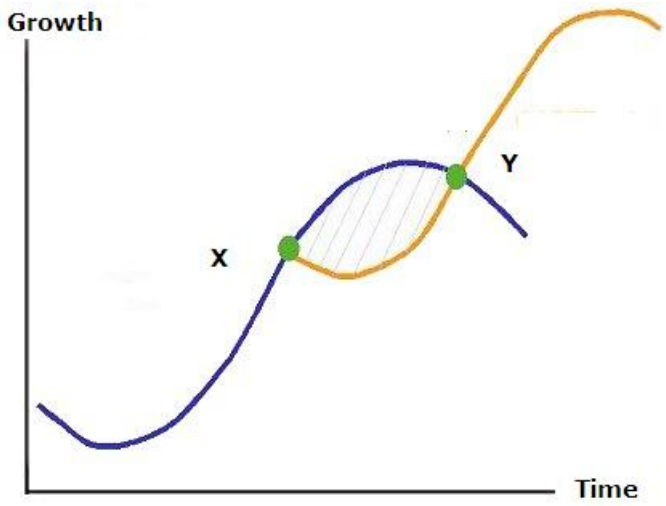

Figure 2.

Man is inherently resistant to change, be it personal or organizational change. Motivation to change, really change, is only found when the present becomes too uncomfortable to live with. In other words pain is the motivator for change. The ability to change at point X will have to be something other than pain. This is the point where a (new) visionary leader must motivate his/her followers, to not only accept but to embrace change, with visions of greatness to come. The leader needs to create a vision that a critical mass of employees will accept as a desirable change for the organization (Tichy, p.40).

At point X there are still enough time, resources and energy to get the new curve through its initial floundering and explorations before the first curve begins its downward journey. If the new curve is delayed till point Z (see figure 3), when disaster is staring the organization in the face, it is going to require a mighty effort to get it to the level it could have been if the new curve has been initiated in time. A complication at this point is that the leaders are now discredited because they are seen to have led the organization into the doldrums, resources are nonexistent and energy levels are low. Typically at this point people are laid off, the staff is getting depressed and new people are brought in at the top. The new people at the top are very necessary if the organization is to be salvaged. Only people who are new to the situation will have the credibility and a vision to lift the organization back on the path of a second wave.

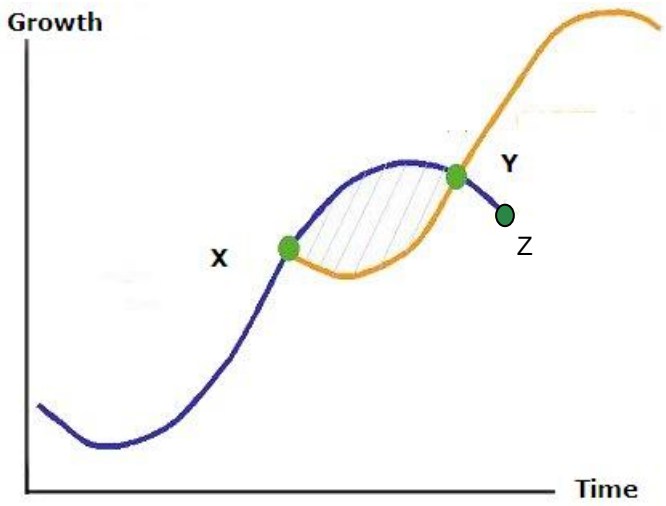

Figure 3.

It is wise to start the second curve at point X because that is the way to built a new future while the present is being maintained. This however is not the end of the problems. The new curve has to be significantly different from the old one. Irrespective whether it is a new product, a new way of operating or a new service. Even with the new curve being started well in time it is necessary to have new leaders. That is because it is the continuing responsibility of the existing leaders to keep the old curve going long enough to allow the new curve to proceed through the initial insecure stages without too much pressure to perform. Also because the leaders of the old curve will find it difficult to abandon it while it is doing so well, even if they recognize that the present booming situation cannot last. This is where, for a time, new ideas and new people will have to coexist with the old until the next curve has started to wax and the first begins to wane.

The shaded area (see figure 3) between where the new curve is initiated and the end of the old one, is thus a time of turmoil and insecurity. During this time two sets of ideas (and people) are competing for the future. The leaders of the first curve are in a precarious position. They have to support the plans of their successors as well as their own ultimate departure. This is no easy task but those that succeed will ensure the renewal and continued growth of the organization.

In the political arena **F W de Klerk**, past president of the Republic of South Africa, is a good example of a leader who stepped down in time to allow the second curve and the new leader, **Nelson Mandela**, to come into power. In doing so in time, he ensured the continued growth of the country. With hind sight it can be said that had he not done so, the old curve (apartheid) would have ended in civil war, leaving the country ruined. This would also have made it all that much more difficult for the new, tender democracy to be established. Even now it cannot be said that South Africa is out of the woods yet, but at least the transition was peaceful and the necessary infrastructure, so essential to ensure the success of the new dispensation, stayed intact. At this point in time South Africa is still in the shaded area, the new regime is not yet delivering, the transition has still to be completed.

The problem with starting the new curve at point X is that the point can only be plotted after the peak has been reached. Handy (1994, p49 - 50) illustrates this beautifully with the story of how an Irishman has given him directions to a destination by telling him that he should turn left two miles before he gets to Davy's Bar. His story about the chairman who told the board:

"I have two messages for you today," he said. "First I want to remind you that we are a very successful business, perhaps more successful today than we have ever been. Secondly, I must tell you that if we want to continue to be successful we shall have to change, fundamentally, the way we are working now." He went on to explain why the different futures he foresaw would require different responses, but no one was listening. The first message had drowned out the second. (Handy, 1994. p.50)

This also shows that even if one has a visionary leader who is able to determine point X, it is no easy task to start the new curve.

2.2 THE NEW CURVE AS A WAY OF LIFE

The concept of the Sigmoid curve can help many to understand their current situation. In trying to answer the question of where they are on the curve, they are forced to make a personal assessment of the status of their organization or personal life. Very often the answer is closer to point Z than X.

If one makes the new curve a way of life, it requires that you always assume that you are close to the top of the first curve, that is at point X, and should therefore be getting ready to start a new curve. Individuals should work on the premise that their life will not go on as it has in the past and that a new direction will be needed within two or three years. Organizations should assume that their present products/services/ strategies will have to be replaced within the next few years.

Although it may turn out that the assumptions are wrong and that the current trends are extended for a much longer time, that the first curve was really only in its introductory phase, nothing has been lost. The leg work of the second curve has been done. No major investments would have been made before the second curve overtakes the first. Something that is impossible to occur if the first curve is still on it's upwards swing.

The exercise of devising a second curve in itself is however not a wasted one. In the process you are taught to question the foundations of the first curve and to dream up some possible alternatives. In making the second curve a way of life one has to follow the wheel of learning. The wheel of learning has four quarters, it starts with:

a) a question (what has to change). It proceeds to the stage of
b) free thinking where all the possibilities are explored. The next quarter is the
c) testing phase where the feasibility of the ideas is looked into. The results of these tests are contemplated in the
d) reflection phase.

In devising a second curve one should be careful not to try to revive the first one, the second curve is always different although it is based on the first one and grows from

it. If the second curve is a way of life in an organization, it will never be at a loss as to what to do next when they arrive at point X.

Not having a second curve, or even a first one for that matter, in place is however not a guaranty for failure. When Bill Hewlett and Dave Packard decided in 1937 to first starts a company and then to figure out what they would make they had no great vision of the Hewlett-Packard range of computer equipment (Collins, 1995. p. 81 - 82).

2.3 THE LOGIC OF THE CURVES

The underlying logic of the Sigmoid curve is that nothing lasts forever and that nothing was there for ever. It is the conviction that everything in the world has its own Sigmoid curve.

This logic is not obvious if you are still ascending the first curve. However, when you begin to realise that you are not going to stay where you are (at the top) by the same means that got you there in the first place, the logic becomes clearer. The logic also means that (product/service) life has to start over. Something that becomes more difficult as one gets older. Therefore it is better to leave the new curve to the younger generation for they have a better view of where the old curve is heading and what the new one may be. It will be wise of the older generation to enable them to be different and to get out of the way when the new curve gathers momentum. Inherent to this logic is the notion that the past may not be the best guide to the future, that there may be another way. The first curve must be sustained until the second one has gathered sufficient momentum to be able to survive without the resources only the first curve can provide. The secret is one of balance, to allow the past and the future to coexist in the present (Handy, 1994, p.61).

2.4 SEEDING THE NEW CURVE

Second-curve thinking will come most naturally from the second generation, those who will inherit the future. The second generation will however need both permission and encouragement. They must realise that what they think of as a revolution is most probably the way to be followed in future.

The first generation must inform the new thinkers (the second generation) that they are committed to support them. This will prevent the first generation from involuntarily defending the status quo, which is the first curve, and in doing so destroy the beginnings of the second curve.

Equally important as the support of the first generation is the acceptance of their role as second-curve thinkers by the second generation. Being young and ambitious there is a danger that the second generation may want to leave this responsibility until later and favour the present with most of their efforts and talent. That the future is the concern of those in charge, while in actual fact it should be the other way round.

The first generation has the responsibility to bring the second generation to the realization that they must have a commitment to help shape the organization they are likely to inherit.

3 INFORMATION MEDIA AND THE SIGMOID CURVE

When one supports the logic of the second curve and is looking at the various media that has served to record information onto in the history of mankind, the pattern of how the media followed on one another is quite noticeable. It can be viewed as a series of curves.

3.1 THE PREVIOUS CURVES

If the scripts on the walls of caves are not taken into consideration, it can be said that the clay tablet served as the first medium, at 3000 BC, onto which information was recorded in any significant extent (Feather, 1994, p. 10). This was followed by the curves of the papyrus - and parchments roll, with papyrus reaching its peak at about 400 BC (Thompson, 1977, p.10), when parchment over took it in terms of popularity at about 200 BC (Johnson, 1976, p. 10 - 11). According to Feather (1994, p.18) the new curve to succeed the one of the parchment scrolls was already introduced towards the end of the first century BC and was growing strong at 400 AD. This was of course the codex.

The introduction of paper in China at the beginning of the fifth century AD and its subsequent spread westwards, during the next thousand years, gave Gutenburg the opportunity to start the curve of the codex, the book as we know, it today in 1454.

Since then other curves started, not to replace the book, but rather to supplement it. These are the curves of the newspaper, recording and transmission of sound, and also cinema and televison.

Then computers were introduced. The electronic storage of information had its own curves within itself and formats such as magnetic reels, floppy discs, CD ROM, CDI, photo-CD, WORM etc. followed one another in quick succession, each building on its predecessor.

3.2 THE PRESENT STATUS

For the first time since the acceptance of the book as THE medium of information storage, people are now talking of a new library, a digital one. Just as talk of a papyrus library must have sent shivers down the spines of Ashurbanipal’s librarians, some modern day librarians and bibliophiles look with horror upon the possibility of a library consisting of bits and bytes. Where a cold and unfriendly screen has to be coached to life with a keyboard which has a most illogical layout. Where mysterious questions such as: "abort, fail, retry" has to be answered in a vain effort to convince the machine to release the necessary information it keeps in its fragile brain.

In order to determine whether the digital library is a serious threat to the traditional (book and paper) libraries, it is necessary to find the point where books are on the Sigmoid Curve. However, this can be only done after the peak of the present curve has been reached. The point X can only be determined after point Z has been reached as shown in the first parts of this paper.

It can be argued that the traditional media and information carriers are on the downward dip of the Sigmoid Curve. That we are finding ourselves at the end of one era and at the dawning of another. This shaded area is however a time of great confusion. No matter how wise and benevolent they may be, the leaders of the first curve must worry about their own futures when their curve begins to die, as it inevitably will. This can be observed in the actions of some information professionals, holding on to the traditional way of rendering an information service. Only if they can move into the next curve will they have a continuing life in their field of operation.

3.3 THE NEW CURVE: THE DIGITAL LIBRARY

The widespread image of instantaneous worldwide access to information is somewhat deceptive. The emergence of the digital library is hampered by the capital intensiveness of the industry as well as the dynamic character thereof.

Instant information can indeed be available if the owners of the information would make it so and the seekers were able to gain access to it. The easy availability of information on computers and computer networks is a myth. The reality is that access to information is increasingly dependant on wealth and skills, on a scale which has not been true in the world of print nor in the mass media. That is the paradox. Technology has made more information more available to more people than at any time. But the same technology has made access to it more difficult.

Looking at the electronic journal, the 240 titles, as counted at the end of 1994 (Van Brakel, 1995. p. 57), indicates a trend which cannot be ignored. When subjected to criteria to determine journal quality it is clear that the electronic journal is not far from being accepted by the scientific community. Collins and Berge (1994, pp.773 - 776) propose the following criteria:

- Credibility - Already some journals are refereed, for example Online journal of current clinical trials.
- Permanence - The lack of archiving is often mentioned as a con of the electronic journal. Some WWW sites have started to archive journals, for example http://bubl.ac.uk/
- Accessibility - As TCP/IP is becoming the major protocol this is increasingly less of a problem.
- Technical - With the introduction of WWW's HyperText Transfer Protocol the technical limitations imposed by ASCII text disappeared.

The other features of the digital library such as listservs, E-mail, FTP, Telnet, Gopher and more, present a rich variety of means and techniques by which information can be obtained.

4. THE CHALLENGE OF THE NEW CURVE

As a library science student in the midst of a course on the Internet reference sources, let me assure everyone that the Internet will soon go the way of quadraphonic sound. It is a great source for the pictures of naked people, the musings of 19-year olds on

Smashing Pumpkins, and lists of whimsical pictures made from ASCII type, but as a source of information for most people it is ultimately useless. (Lynch, 1996)

When first radio and the television were developed, they were hailed as great potential instruments for the transfer of information, education and cultural enrichment. In some ways they succeeded, but there were also many lost opportunities. A major challenge is to see to it that Internet will not develop in a primary commercial and entertainment tool.

No one argues the potential of the Internet to be the most important source of information yet devised by mankind. Lynch echoes the thought of many, that the Internet is not the most important source at this point in time. That is because developers of the Internet have focused on the technology of information delivery systems, not on the nature of the information itself. Greater attention needs to be paid to content of the message, instead we are dazzled by the medium (Smock, 1995. p.B1).

Part of the challenge of the new curve is to determine what kind of information must be placed on the Internet and in what form. Another challenge is to ensure that the right kind of information will survive in what is a commercially controlled information infrastructure. This is a very real concern because in the Internet's short life, the number of commercial addresses exceeded the number of educational ones already in 1995 (Smock, 1995. p. B1).

Other challenges are among others to find a way in which the accuracy of information can be determined and, of course to, solve the copy right problems associated with the electronic format.

5. CONCLUSION

Although it cannot be stated as fact that the digital library is the next Sigmoid Curve of libraries, it will be folly for librarians not to consider this likely possibility very seriously and to ensure that they are prepared should it happen. The wise librarian must see to it that he has young up coming and dynamic leaders in his organization, prepared to ride the next wave so that the library may benefit.

What is clear at this stage, is that even if books and the traditional formats are not replaced by computer media, computer media, at the very least, will be a very important permanent supplement thereto. This point of view is based on the fact that the important thing about media is that they should be appropriate. Appropriateness is not an absolute concept, but it can be defined in terms of suitability for a purpose. With the huge gap between the First and Third World, it stands to reason that the digital medium is not an appropriate one for the latter. The First World is thus closer to point Z on the curve and the Third World closer to point X.

The world as a whole, however, changes more spontaneously, and never so erratically, as during a period of dramatic technological change. (Euster, 1996. p. 6)

These words caution us to expect even more (dramatic) change in the information profession. An open mind should be kept regarding problems and opportunities this offer our profession.

6. REFERENCES

1. **COLLINS, James** and PORRAS, Jerry. Building a visionary company. California management review. 37(2) 1995: pp. 80 - 100.
2. **COLLINS, M.P.** and **BERGE, Z.L.** IPCT journal: a case study of an electronic journal on the Internet. Journal of the American Society for Information Science. 45(10) 1994: pp. 771 - 776.
3. **EUSTER, Joanne.** Maturity, leadership and generational change in libraries. Library management. 17(1) 1996. pp. 5 - 10.
4. **FEATHER, John.** The information society: A study of continuity and change. London, Library Association Publishing. 160 p.
5. **HANDY, Charles.** The empty raincoat: Making sense of the future. London, Hutchinson, 1994. 280 p.
6. **JOHNSON, Elmar** and **HARRIS, Michael.** History of libraries in the western world. New York, Scarecrow, 1976. 354 p.
7. **LYNCH, James.** (1996, March 20). Role of libraries in the twenty-first century. Soc.libraries.talk [Newsgroup]. Available E-mail: jl1748@cnsvax.albany.edu [1996, March 20].
8. **SMOCK, Raymond.** What promise does the Internet hold for scholars? The Chronicle of higher education. 42(4) 1995: pp. B1 - B2.
9. **THOMPSON, James.** A history of the principles of librarianship. London, Clive Bingley, 1977. 236 p.
10. **TICHY, Noel** and **DEVANNA, Mary.** The transformational leader. New York, John Wiley, 1986. 306 p.
11. **VAN BRAKEL, Pieter.** Access methods to electronic journals via the Internet. South African journal of library and information science. 63(2) 1995: pp.56 - 64.