: What is the technology adoption curve? Is it relevant to DSS?

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The technology adoption curve (TAC) is a theory about how individuals and organizations behave in implementing innovative technologies. A quick examination of the framework shows some similarities to the product life cycle curve discussed in business marketing courses. The theory is however more sophisticated than a life cycle or a diffusion model. The underlying model of technology adoption identifies 5 types of adopters of technology with very different interests and buying characteristics. The companies and individuals that are first to adopt a new technology are called innovators. The second type is known as the early adopters. The third type is called early majority, then the late majority adopters and, finally, the laggards.

Technology refers to products including software that are based on scientific knowledge. As scientific discoveries are made innovators often apply the new scientific findings to create useful products. Adoption of new innovative technologies seems to occur following a pattern. The technology adoption curve pattern is presented as a traditional bell-shaped curve with exponential growth in the beginning phase of adoption and a slowdown in adoptions occurring during the late adoption phase. When a new technology is introduced, it is usually hard to find, expensive and imperfect (even flawed). Over time, the new technology's availability increases, cost decreases and features improve to the point where a many people can benefit from adopting the technology. The technology diffuses and spreads to general use and application.

Adoption occurs in phases and adopters in each phase have similar characteristics. In the initial phase innovators are technically oriented users and “visionary”. In the final phase laggards are practical and conservative. The early adopters are seeking a competitive advantage. Productivity issues and conformity influence the early and late majority adopters. Some technology innovations reach a “dead end” early in the adoption cycle. These immature or premature innovations "flame out". The technologies that change industries and even society are the “killer applications” like the VisiCalc spreadsheet.

In summary, **Innovators** are enthusiasts who adopt a new technology for its own sake, with no clear purpose in mind. **Early Adopters** have the vision to adopt an emerging technology and apply it to an opportunity that is important to them. **Early Majority** adopters are pragmatists who do not like to take the risks of pioneering, but are ready to see the advantages of tested technologies. They are the beginning of a mass market for the new technology. **Late Majority** adopters are also pragmatists and this group represents about one-third of available customers. This group dislikes “discontinuous innovations” and believes in tradition rather than progress. The late majority buy high-technology products reluctantly and do not expect to like them. **Traditionalists** (or laggards) don't really like technology. This group performs a “reality testing” service for the rest of us by pointing out the discrepancies between the day-to-day reality of a technology product and the often

exaggerated claims made for it.

The technology adoption curve (TAC) model is relevant to understanding the adoption of various information and decision support technologies. For example, model-driven DSS are probably at the late majority stage, but Web technologies have reinvigorated that type of decision support and changed its adoption curve. Data warehousing and analytics are probably still in the hands of the early majority. Customer Relationship Management (CRM) may be at the late majority stage. Communications-driven DSS have been adopted quickly. Knowledge-driven DSS and Artificial Intelligence are probably still in the early adoption stage. Document-driven DSS are evolving with the Web technologies. Analytics are extending and expanding the statistical and quantitative technologies used for decision support. Some decision support technologies like virtual reality have however been dead ends and disappointments.

Technology adoption is moderated and influenced by technology acceptance. The technology acceptance model (TAM) explains how people come to accept and hence use a technology. Perceived usefulness and perceived ease-of-use influence technology acceptance and adoption (Davis 1989).

Don Norman is often credited with first explaining the technology adoption curve model. See an example of applying the curve to microprocessor technology at startribune.com/digage/curve.htm. Gordon Moore, co-founder of Intel, also helped popularize the technology adoption curve.

Moore's view of technology adoption prescribes that a company can not expect to target a mass market directly with a technology innovation. Rather, the company must first target the early adopters. So what do you think? Does the technology adoption curve hold for innovative decision support applications? Will data visualization tools follow this curve? What about OLAP or data warehouses? Simulation models and optimization? Or Web-based DSS?

The literature on technology adoption and diffusion is large and varied. The phenomenon is part of daily life and seems to be increasingly widespread and rapid. The pervasiveness of the phenomenon and the implications for entrepreneurs and society encourage research and nuanced discussion. Trends suggest technology innovation will continue in many areas including decision support and analytics.

References

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