Is Your Organization Making Good Product Decisions?

CIMdata Commentary

Key takeaways:

- *Product development is a continual process of making decisions that turn the unknown into the known*
- *Faulty decisions can have a huge impact on your company*
- *High quality knowledge is required for making good decisions*
- *Building knowledge that results in corporate wisdom requires stable communication channels*
- *A new breed of decision-support tools establishes stable communication channels*

Product Development Decisions

What is a decision?

The Merriam Webster Dictionary defines a decision as *"a determination arrived at after consideration."* Product development decisions are those conclusions or resolutions that impact or affect a product. They can be classified into five broad phases of the product development process: concept development, product design, supply chain design, performance testing and validation, and production ramp-up and launch. Decisions are made by individuals, teams, and management. Some decisions can have a significant impact on the product, such as selecting a material or a component, while other decisions are seemingly inconsequential. Decision making is a critical activity performed continually throughout the product development process, by just about everyone.

Product development is a continuous process of refining the unknown into the known facilitated by decisions made both individually and collectively. With the complex products we develop today, it is often impossible for an individual or even a team to gather enough knowledge to make the needed decisions to turn an unknown into a known. Developing complex products requires marshalling the resources of both the organization and the extended organization.

Product development participants and leaders should evaluate their decision-making capability. Does your organization have a formal decision-making process? Does it record decisions and estimate their impact, evaluate past decisions, and have a knowledge resource to draw on for making good decisions? If the answer to any of these is no, it is worthwhile spending the time and effort to develop a robust decision-making capability.

Impact of Faulty Decisions

Just about every company has faced the impact of a faulty decision. Some decisions have led to spectacular product failures, while others have resulted in a minor annoyance for customers. Decision making is very important, and avoiding faulty decisions should be an objective of every product development organization.

Given the amount of time most organizations spend making decisions, the number of people involved, and the potential impact on profitability, it is surprising how little attention most organizations pay to the decision-making process. Often people involved in product development complain about how much time they spend in meetings. Yet the purpose of most meetings is to make decisions.

High Quality Knowledge

High quality knowledge is essential to avoiding faulty decisions. After all, a decision made by using inaccurate, out-of-date, or faulty knowledge has a high probability of producing results that are different than intended.

In his book on decision making, Vincent Barabba[1] defines high quality knowledge as:

- Understandable to those who must use it
- Timely and able to be found and "pulled" when needed
- Reliable, in that diverse observers using the same procedures see it in the same way
- Valid, because it is cast in the form of concepts and measures that capture reality
- Adequate when the account is full (that is, when the entire context of the question, problem, or situation about which the decision is being made is met to the fullest extent practicable)

According to the influential management consultant C. West Churchman, "…to conceive of knowledge as a collection of information seems to rob the concept of all its life....Knowledge resides in the user and not in the collection. It is how the user reacts to a collection of information that matters."[2] The great fault of most knowledge management projects and systems is that they concentrate on collecting knowledge, not on how the knowledge is used. Knowledge has no use to an organization unless it can be leveraged to make high quality decisions.

Enabling High Quality Decision Making

Truly great decisions are made when an organization has subject-matter wisdom. In some ways, this concept is so fundamental we can't explain it yet we intuitively know it to be true. There are multiple ways to look at knowledge but they all revolve around the concept that knowledge is hierarchical. As Barbara Minto, the creator of the *Pyramid Principle* (used by leading management consulting firms), says, *"Don't ask me, that's the way the brain works."*

How does an organization build collective wisdom? Before an organization achieves wisdom, it must achieve understanding. Before it can understand it needs knowledge, before knowledge, intelligence, and finally before intelligence, information. So building institutional wisdom is a hierarchical process of communication. With multiple people involved in building wisdom, as is necessary for today's complex products, communication is the essential capability, necessary at every step in building the hierarchy from information to intelligence to knowledge, to understanding and wisdom.

---

[1] Barabba, Vincent P. *The Decision Loom: A Design for Interactive Decision-making in Organizations*. Triarchy Press. Axminster, Devon. 2011.

[2] Churchman, C.W. *The Design of Inquiring Systems.* Basic Books. New York. 1971.

Need for a Stable Communication Channel or Information Carrier

If accumulating wisdom requires understanding, knowledge, intelligence, and information, and moving up the knowledge hierarchy requires information transfer at each stage, then it follows that a fundamental requirement for building wisdom is a stable, low-loss, low-noise, communication channel (or information carrier).

A communication channel can take many forms. It can be a process or company policy that defines how people should communicate about a subject. It can be an information technology (IT) software application such as a social medium or email. It can be the cultural norms that define how people interact. A communication channel can be a face-to-face interaction, an interaction over a telephone, or a video conference. The key is that a channel has a standard, common syntax that is understandable to the transmitters and the receivers of the information. It should be noted that language refers to more than just a spoken language such as English, Italian, or French; language refers to such things as the broader communication context, the cultural norms, engineering discipline, technical definitions, and standards.

Information Theory provides the mathematical reasons why a stable communication channel is required for high volume information transfer. Information Theory was developed and published by Claude Shannon and Warren Weaver; it says that an increase in information transfer increases the probability that information at the destination will not be exactly the same as at the source.[3] The way to reduce miscommunication is to establish a stable communication channel.

Decision Support Systems

The good news is that IT solutions and especially decision support tools can provide stable, low-noise communication channels for building wisdom and for enabling better decision making. The stability is provided by establishing a common, bottom-up communication channel where people collectively develop and establish the ways they will communicate. Establishing a stable communication channel cannot be accomplished by creating and sharing documents or files filled only with words; there is too much variation in the information that can be put in the document. Stable communication needs a structure, much like a database, but without the constraints that come with a database.

A new breed of decision support tools takes a more ‘social’ approach to building corporate wisdom through a continuous, collaborative, bottom-up process. Engineers can use these tools to collectively develop knowledge through a defined, agreed-upon structure that facilitates communication, and ensures that what is entered is received with little loss of knowledge fidelity. The structure removes most ambiguity—and hence the noise—from the communication. An important feature of these decision support tools is their ability to make timely suggestions for relevant knowledge and to increase information standardization. Also, they do not capture knowledge in documents, which tend to be inert with respect to decision making, but rather define discrete, logical units that can interplay directly in decision processes. Due to the ability of these tools to capture evolving knowledge as engineers work, they assist the organization with establishing and maintaining a consistent language. This consistency establishes a stable communication channel.

[3] Shannon, Claude Elwood, and Warren Weaver. *The Mathematical Theory of Communication*. University of Illinois Press. Urbana. 1949.

When engineers and designers can use a knowledge-based decision-support platform, they can make much better decisions. The corporate knowledge they use to make decisions is up to date, complete, and correct, and is structured, in context, and understood. The result is better products of high quality and with many fewer problems.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at http://www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.