



Chapter XII

Know-CoM: Decentralized Knowledge Management Systems for Cooperating Die- and Mold-Making SMEs

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EXECUTIVE SUMMARY

The die- and mold-making industry can be characterized by small and medium enterprises (SMEs), sophisticated technologies, and highly skilled employees who have to cooperate in order to fulfill orders of customers with which they are engaged in an intensive process of knowledge exchange. The knowledge-intensive production process of die and mold makers consequently requires an integrated organizational and technical solution to support the sharing of documented knowledge as well as collaboration. Standard knowledge management systems (KMS) primarily target the organization-internal processes and documented knowledge of large organizations. Know-CoM intends to overcome the limitations of these solutions and explicitly targets

SMEs as well as knowledge processes that cross organizational boundaries. Know-CoM is a European Commission-funded CRAFT project that provides an advanced concept of decentralized management of access privileges to personal, protected, and public knowledge spaces. An easy-to-use solution supports the capturing of experiences. A joint knowledge structure brokers context across organizational boundaries and eases discovery of knowledge and experts. Finally, a knowledge management certification technique allows for a coordinated reuse of knowledge that is integrated with the daily work practices of die and mold makers.

BACKGROUND

Dies and molds are characterized by hard, low-wear materials, complex geometry, and structures. Their production requires sophisticated technologies, for example, five-axis machining, high-speed cutting, and so forth, and highly experienced and qualified staff (Antoñana, 2000). Dies and molds are used in many industries, for example, by suppliers of components in the automotive industry. Their prices vary by an average of 45,000 from 20,000 to 800,000, whereas the margins are about 6%. The lead time for the production of a die or mold ranges from one to 10 months. For toolmakers, the most important competitive factors are time to market, personnel costs, and quality of the resulting tools. The last ISTMA Annual Report (Antoñana, 2000) highlighted some of the handicaps of the European tool and die industry competitiveness:

- Continuous pressure to reduce time to market
- Strong pressure on prices and high personnel costs
- Growing difficulty to attract and acquire skilled workers

In many SMEs, these handicaps lead to bad working conditions, accidents, and even social problems (Antoñana, 2000).

The market size is 25,000 million euros worldwide (Antoñana, 2000). The European die- and mold-making industry is composed mainly of small and medium-sized enterprises (SMEs) with an average of 23 employees. There is a wide variety of dies and molds (e.g., die casting, plastic, or glass molds) for different purposes and industries. Typically, die- and mold-making companies (DMCs) specialize in certain areas of the industry. Many products require the combination of several dies and molds from different fields and thus customers regularly need to obtain them from more than one producer. Thus, cooperation between DMCs holding complementary competencies is necessary in many cases, particularly to acquire large orders. Producers have to coordinate their activities closely and communicate intensively in order to jointly execute orders. However, the specialization of the DMCs is not only complementary, but also overlapping. Therefore, the relationship between the DMCs can be described as cooptation, because they cooperate and collaborate on the one hand during the joint execution of orders and on the other hand, they compete in markets. Regarding the introduction of knowledge management (KM), the state of cooptation on the one hand requires advanced instruments that create an environment for unobstructed knowledge exchange between the cooperating DMCs and on the other hand, competition poses a significant barrier for the exchange of knowledge across organizational boundaries. In addition to the cooperation and exchange of experiences with other die and mold makers, the DMCs often need to exchange

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