4.4 Implementation of a VDA Interface in the CAD System STRIM 100

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4.4.1 Abstract

Demand from the German CAD market has led to the implementation of a VDA (Verband der Automobilindustrie) interface in the CAD system STRIM 100. This product has been developed by the French company CISI (Compagnie Internationale de Service en Informatique). The VDA interface of STRIM 100 has been created by the German subsidiary of CISI, the LKS daten service AG in cooperation with the BMW AG in Munich. The mathematical representation of the STRIM 100 entities is a polynomial one using the well-known Bézier polynomials. The VDA interface is split into a VDA output and a VDA input module. The entities of STRIM 100: points, curves and patches, can be handled easily. The computer language used is FORTRAN IV. Preliminary experience with customer installations can be reported.

4.4.2 Introduction

The idea of exchanging information among different CAD systems is a very old one. But it was a big surprise that a few specialists of the German automobile industry were able to create within some months an interface that is now a standard for all CAD systems used in that part of German industry. The work initiated by the VDA (Verband der Automobilindustrie) has led to VDAFS, VDA Flächenschmittstelle [1], an interface that is able to exchange geometrical information as well as additional information in a special header or comments. Because a high percentage of the STRIM 100 users work in the automobile industry it was decided in 1984 to implement a VDA interface in the version 2.0 of STRIM 100. As will be shown in the following sections the simple mathematical structure of STRIM 100 allowed an implementation within only six man-weeks.

4.4.3 STRIM 100: the Product

STRIM 100 is a powerful and complete CAD/CAM system satisfying all mechanical construction requirements. It has been developed by the French company CISI (Compagnie Internationale de Services en Informatique). About 3000 persons work for CISI worldwide. The German subsidiary is LKS daten service AG.
The author is the leader of the LKS office in Munich and has implemented the VDA interface in cooperation with BMW AG.

There are three separate modules communicating with each other via sequential or direct-access FORTRAN datasets:

- STRIM 100 C Construction in 2D, generation of complete drawings, 2 1/2 D NC machining preparation
- STRIM 100 T Construction and interactive NC machining preparation of complex freeform surfaces
- STRIM 100 M Generation and handling of meshings with interfaces to finite element calculation programs (CASTEM, NASTRAN,...)

All modules run on the same hardware:

<table>
<thead>
<tr>
<th>Computers</th>
<th>Screens</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM 30xx</td>
<td>IBM 3250</td>
</tr>
<tr>
<td>IBM 43xx</td>
<td>IBM 5080</td>
</tr>
<tr>
<td>DEC VAX</td>
<td>TEKTRONIX 41xx</td>
</tr>
</tbody>
</table>

At the end of 1984 there were about 85 installations of STRIM 100 in Europe. To mention only some important STRIM 100 T customers:

- BMW AG, Munich, Germany
- VEGLA, Herzogenrath, Germany
- SAAB, Sweden

\[
\begin{align*}
  x & \quad P_{\text{oint}} \\
  \rightarrow & \quad P = (x, y, z) \quad \leftrightarrow 14 \\
  \text{Curve} & \quad C(u) = c_{,u} u^{a-1} \quad \leftrightarrow 12 \\
  \text{Patch} & \quad S(u, v) = c_{,uv} u^{a-1} v^{b-1} \quad \leftrightarrow 17 \\
  \end{align*}
\]

Fig. 4.4.1. The entities of STRIM 100 T and corresponding FORTRAN data sets