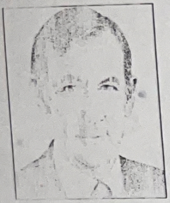
APPLIED INTELLIGENCE

AD/Cycle Repository Opens Door to Standard Design



JAMES MARTIN

Second of a series of articles on the IBM Repository, a significant component of IBM's applications-development strategy for the 1990s.

The IBM Repository, announced last month, establishes a common standard for design specifications generated by computer-aided software engineering (CASE) products and other development tools. As described in last week's article, the Repository represents a critical component of AD/Cycle, which provides a standard development environment within IBM's Systems Application Architecture (SAA).

Users demand an open software-development environment in which tools from many vendors can be used interchangeably, sharing specifications from a common repository of design information. In defining a repository standard, IBM is taking a major step toward providing support for an open software-development environment.

Many vendors of software-development tools claim compliance with IBM's application-development standards; still, it's important to determine the level of commitment that the vendor intends to make to the standard.

As the figure shows, there are at least four levels of compatibility with the AD/Cycle standard for an applications-development environment standard:

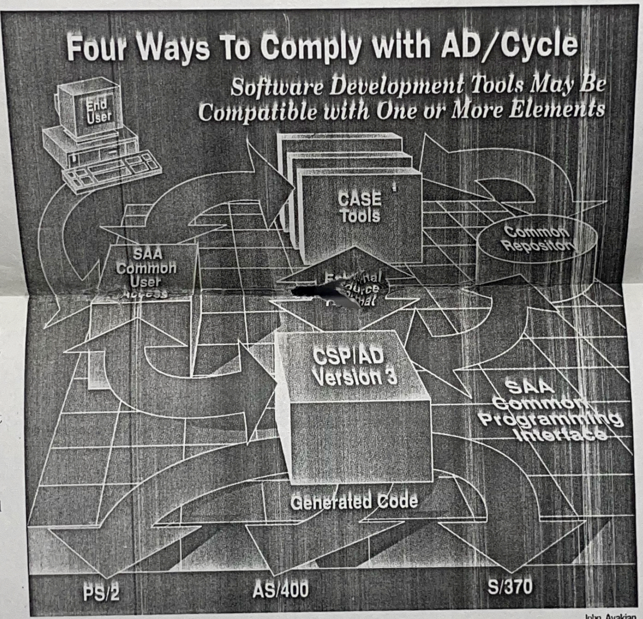
- **Compliance with CUA.** Entails support for a common user interface for all applications, using the Common User Access services specified by SAA.
- **Compliance with AD/Cycle.** Entails use of a common standard for design specifications, as defined by the AD/Cycle Repository.
- **Compliance with External Source Format (ESF).** ESF is an IBM specification language used to import/export design specifications from front-end CASE tools to Cross System Product/Application Development (CSP/AD), the designated SAA application generator.
- **Compliance with Common Programming Interface (CPI) services.** Such services are direct interfaces with the programming languages, presentation and dialogue services, communication interfaces and database interfaces provided by the CPI component of SAA.

As for the standard itself, the AD/Cycle Repository is a key integrating factor in providing an open development environment. The Repository defines the objects required to support all phases of the development life-cycle process. To be fully compliant with AD/Cycle, tools from third-party vendors must incorporate repositories that are based on the same meta data model that has been defined by IBM for the AD/Cycle Repository.

IBM recognizes that its current Repository contains only a fraction of the information required for complete CASE development, such as that stored in the CASE Encyclopedia of Texas Instruments' Information Engineering Facility or KnowledgeWare's Information Engineering Workbench. IBM is working intensively to expand its current Repository design so that it will eventually provide all the facilities required by powerful, high-end CASE tools.

One of the more pivotal considerations is compatibility with the ESF.

Currently, CSP/AD runs as a development tool only on S/370 mainframes. However, it generates code that can be executed on AS/400 midrange machines and PCs. IBM has announced that CSP/AD version 3 will be available on the PS/2 workstation in June 1990 as an SAA application-generation facility.


Four Ways To Comply with AD/Cycle
Software Development Tools May Be Compatible with One or More Elements
End User
CASE Tools
Common Repository
SAA Common User Access
External Source Format
CSP/AD Version 3
SAA Common Programming Interface
Generated Code
PS/2
AS/400
S/370

John Avakian

IBM's Repository will make it possible to use CASE tools from different CASE vendors, all of which interact with a common knowledge base of design information.

ESF is a published interface to the Cross System Product that enables third-party vendor tools to connect with CSP/AD. It is represented as a General Markup Language (GML), which is a human-readable language consisting of tags and attributes (hence, the common designation of ESF as a tag language). ESF can be used to export design specifications from design and analysis components of CASE tools to build complete or partial applications using the CSP/AD code generator. Specifications can also be imported from other applications-development tools and application models. ESF can be used within an integrated project-support environment to import/export design specifications to a variety of library and configuration-management tools.

To date, several vendors of applications-development tools have announced ESF support, including Index Technology Corp., KnowledgeWare Inc., McDonnell Douglas Corp., Nastec Corp., Sage Software Inc. and Texas Instruments Inc. These vendors are committed to producing an ESF tag language to interface with CSP/AD.

When CSP/AD version 3 is available on the PS/2 as an SAA application generator, it will be used to generate executable code for all SAA environments. Any CASE vendor can use CSP/AD version 3 in that role through the mechanism of ESF.

A vendor might decide not to use CSP/AD as the code generator because there are other application-enabling techniques that may be more powerful. IBM's strategy is to encourage the use of CSP/AD as the application generator for AD/Cycle. However, if a vendor develops a more powerful code generator, IBM does not want to preclude its use. Rather, IBM's intent is that other code generators, as well as CSP/AD, may be used, provided that they conform to the Repository standard, obey SAA standards and create code that's portable within SAA environments.

Many users view the introduction of the IBM Repository and the AD/Cycle applications-development environment as the first steps toward the development of a software-backplane capability. The objective of a software backplane is one of enabling users to select a variety of compatible front-end analysis and design tools, code generators, project-management facilities and other support tools that share design information from a common Repository.

A hardware backplane is based on the concept of plugging standardized hardware modules into a common backplane structure. Similarly, a software backplane uses the concept of plugging standardized software modules into a common design database. However, the database needs to store more than just design information; it needs to be a knowledge base containing all the rule processing associated with objects in the database. The design repository should be an object-oriented database that stores both data and rules. If all vendors use the same object-oriented database with rule-based processing, then they can share design information.

Common Knowledge Base

The Repository contains definitions of all of the objects that are specified by a CASE tool—entities, relationships, data models, process models, normalized database schemes, procedural code. The attributes of these objects are then defined in the form of a normalized relational database.

Next, the rules that must be obeyed by all of the objects and attributes are defined. The database provides the structure of a software backplane. In this way, it will be possible to use CASE tools from different CASE vendors, all of which interact with a common knowledge base of design information.

There will be a diversity of ideas from different vendors and a wide range of views on what constitutes the most powerful tools; however, the tools must be portable, they must interconnect, and they must have integration down the value train across the corporation. One application in the value train might be built with one tool; a different application might be built with another tool. However, the tools must integrate across applications. Building a computerized corporation requires the acceptance of standards, as well as a fully integrated development environment.

Next week, I will describe a strategy for CASE based on the most powerful software-development technology. ■

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