CollabCAD Modeling Philosophy & PLM Strategy

Modeling Philosophy

CollabCAD is a 3D CAD/CAM Software developed based on Free and Open Source Solutions & Libraries for the collaborative design & development of Industrial Designs from the Computer Aided Design (CAD) Group of National Informatics Centre (NIC), Ministry of Communications and Information Technology, New Delhi, the IT support professionals from India.

CollabCAD will run **Windows and Linux platforms**. It is available as **two** modes:

1) **CollabCAD Standalone** – to work on standalone systems
2) **CollabCAD Client-Server mode** for collaborative designing and multiple sharing.

CollabCAD Modules:

- Design & Drafting
- Surface Modeling
- Solid Modeling
- Collaborative Design
- Database Link
- Data Exchange
- Basic NC Operations
- Customization
- Visualisation
- Content Management System
- WorkFlow
- ERP MRP Module

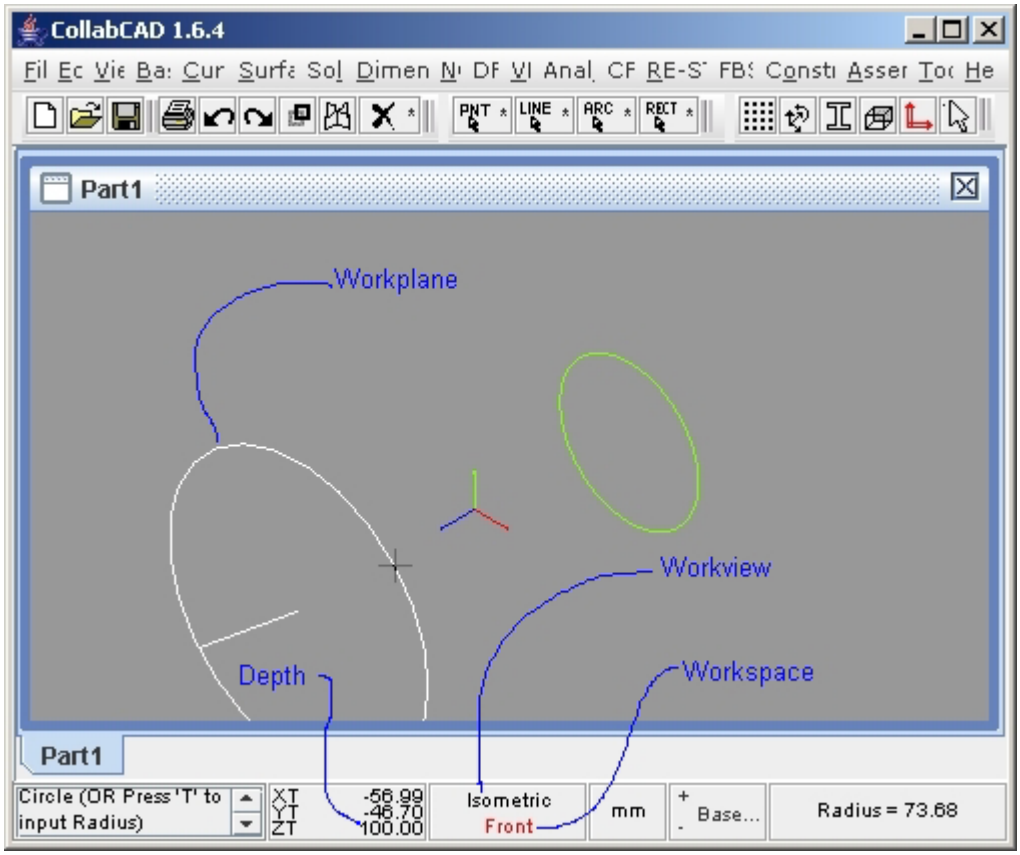
CollabCAD is based on the "**Open Cascade**" Geometry Kernel, which is a 3D Kernel. That is, the point in Open Cascade is a 3D point and so are all the other entities like Lines, arcs etc. Therefore the basic Modeling Philosophy followed in CollabCAD is 3D unlike in other Solutions where the start is 2D and then it gets into 3D Mode.

In view of the above, in CollabCAD one always see the 3D Work Space and starts with 3D Work Space. In CollabCAD Work Space always refers to 3D space.

Work view is a display of any of the 3D spaces such as front, back, top, bottom, right, left, isometric or any of the user defined views. The name of the work view would be displayed in black color in the control panel of CollabCAD.

Work Space is a right-handed orthogonal (composed of right angles) reference space in which you define entities. It is essentially a local coordinate system for defining entities with the origin always at (0.0,0.0,0.0). The abbreviations XT, YT, and ZT are used respectively for the X, Y, and Z transform coordinate axes of the workspace. The name of the current workspace would be displayed in red color in the control panel of CollabCAD.

Work Plane : For each workspace there is a work plane. For a given workspace, the work plane is parallel to the XT-YT plane of the workspace and at a depth along the ZT-axis of the workspace. The depth of the work plane is 0.0 at the time of definition. Whenever you change the current depth, you specify a new work plane long the ZT-axis of the current workspace. The ZT coordinate of the current work plane can be read from the control panel of CollabCAD.



When CollabCAD is invoked as Standalone or Client-Server Mode it will prompt the user to choose the **units (in mm or inch), drafting standard (ANSI or IS)** and **enter part name**. On completion CollabCAD graphics screen will appear which consists of menu bars, toolbars, status bar and tool palette for creating the part or model.

When CollabCAD Screen comes up, one always sees the Work Space: 3D in nature unlike a work Plane that is 2D as happens in other CAD Solutions.

CollabCAD use direct three-dimensional modeling, first the user has to create profile first (sketch in other software). The profile can be of basic entities like points, lines, arcs and curves then go for creating the solid using slab, revolution of solid, sweep solid, loft solid etc

Modeling technique of CollabCAD compared with other CAD software's:

CollabCAD	Other Software's
• While creating a new part, by default the graphics window will be set to front workview and front workspace where user can start creating the part or model. The user has the option of changing the workspace and work view .	• While creating a new part, the user will be in part design mode, there is no work view, the user has to choose a workplane to create sketch in 2D sketcher mode.
• If needed user can **create additional workspace** by various options available in the workspace creation menu and set it.	
• Once the profile (2D or 3D curve) is created in the current workspace the user can create solid model out of it.	• The user has to exit the sketch mode to part mode to get 3D.
• CollabCAD allows multiple profiles in a single workspace.	• Only one sketch allowed per feature for a sketch plane.

The user has the option of grid enable and disable option for fine creation of profile. The user has the option of snap /moving the objects/creating the objects on to grid points.

PLM Strategy

It is said that PLM is not a specific application but a strategy or business approach[1]. Every PLM application has its own methodology and so does CollabCAD PLM. The best PLM software for any organization can be said to be one that best fulfils the organizations requirements. In an endeavor to integrate CAD with PLM, CollabCAD offers a Design Lifecycle Management solution integrated with CAD. ***A design repository, workflow system and an enterprise automation application suite comprising of MRP/ ERP/ CRM/ SCM/ ECommerce applications have been interfaced with CollabCAD.***

CollabCAD allows a great deal of flexibility for part management. The user can save the designs/parts on his local system when running CollabCAD in the Standalone mode or on the CollabCAD server, while using the Client-Server mode of CollabCAD. Provision also exists for the user to maintain the designs/parts in a Content Repository System.

For Design/Part Management, CollabCAD provides an interface to a content repository and incorporates security, locking and versioning of the engineering drawings and documents. The Slide Repository is interfaced with CollabCAD and the user can save/retrieve CollabCAD parts to/from the Repository directly from within CollabCAD. The DAVExplorer(WebDAV client) is used for the management of files, creating users, access control of the repository. Other files such as word documents, pdf documents etc can also be checked in. Any browser (Mozilla FireFox, Netscape Navigator, Internet Explorer, etc.) can also be used to access the CMS server to view the files.

- Provides an interface to a content repository and incorporates security, locking and versioning of the engineering drawings and documents
- Enables hierarchical organization of content, which can be stored into arbitrary, heterogeneous, distributed data stores
- Provides an Access and Authorization Control facility which allows the definition of roles and permissions on a particular drawing/document to users of the system.
- Documents are 'checked in' to a secure location - the CMS server
- The system is able to maintain full revision control of all documents 'checked in' ensuring that users are directed towards working on documents that are fully up to date, and are not being upgraded elsewhere on the network. Every time a document is created or edited, a new revision level can be assigned to it
- Documents/Drawings are stored in a hierarchy of directories (folders)

[1] CIMData - http://www.cimdata.com/PLM/plm.html

CollabCAD uses Bonita for Workflow Management.

- It further provides an interface to a workflow system and enables the user to specify, execute, monitor and coordinate the organizations flow of work
- A comprehensive set of integrated graphical tools for performing the process conception and definition, the instantiation and control of this process, and the interaction with the users and other applications is provided
- A messaging service is also enabled with the workflow through which the participants of the project are informed of the pending activities

CollabCAD is also integrated with an enterprise automation application suite comprising of MRP/ ERP/ CRM/ SCM/ E-Commerce applications. By integrating the Bills of Materials, from CAD applications to an Enterprise Automation application helps in reducing the cost due to duplicate data entry and also eliminates the chances of error in the process. This will not only increase efficiency but also reduce the total cost of the project.