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(AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY)

REPORT ON SUMMER INTERNSHIP

"Internship carried at DesignSense Software Technologies Pvt. Ltd: BricsCAD BIM"

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Civil Engineering VII Semester

Submitted in partial Fulfilment of the requirements for the degree of

Bachelor of Engineering

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CERTIFICATE

This is to certify that the Internship titled **"Internship Carried at DesignSense Software Technologies Pvt. Ltd: Design and BricsCAD BIM"** is a Bonafide work carried out by **Zoya (2SD22CV070)** submitted in partial fulfilment of the requirements for the award of the degree of Bachelor of Engineering in Civil Engineering of S.D.M. College of Engineering and Technology, Dharwad, Karnataka. (An autonomous institution affiliated to Visvesvaraya Technological University, Belgaum, Karnataka), during the year 2025-2026.

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DECLARATION

I hereby declare that this report on summer internship titled **"Internship at DesignSence Software Technologies Pvt. Ltd: BricsCAD BIM"** Is carried out by me under the guidance of **Ms Kushal Kapali**, Department of Civil Engineering S.D.M. college of Engineering & Technology in the partial fulfilment of the requirement of the degree of Bachelor of Civil Engineering, SDM College of Engineering &Technology, Dharwad. I also declare that I have not submitted this dissertation work to any other university for the award of any other degree.

Place: Dharwad

Date:03/11/2025

ACKNOWLEDGMENT

We would like to thank our guide **Ms. Kushal Kapali** Department of Civil Engineering, S.D.M. College of Engineering & Technology, for his constant support, invaluable advice, and guidance.

We express our earnest, profound gratefulness to the Internship committee - **Dr. Pradeep Sangwan** for helping us throughout the project period in every manner.

We thank **Dr. Ramesh L Chakrasali,** Principal and **Dr. R. J. Fernandes,** HOD, Department of Civil Engineering, & Deans of S.D.M. College of Engineering and Technology, Dharwad, for being a constant presence of inspiration and support.

I would like to express my sincere gratitude to the management and staff of Designsense for providing me with the opportunity to undertake my internship in their esteemed organization. I am especially thankful to the HR department for their continuous support and guidance throughout the internship period. I extend my heartfelt appreciation to all the engineers, supervisors, and fellow employees who generously shared their knowledge, helped, and made my learning experience enriching and enjoyable. Their encouragement and cooperation played a vital role in the successful completion of my project.

ABSTRACT

This internship report highlights the learning outcomes and experiences gained during my training at **Designsense Company**, where I worked extensively with **BricsCAD** software focusing on **Building Information Modelling (BIM)**. The internship was divided into two structured phases. In the first phase, I was introduced to the BricsCAD interface, 2D drafting tools, modification and annotation techniques, and the basics of 3D modelling. This phase helped in building a strong foundation for CAD operations.

The second phase emphasized **BIM expertise**, including project setup, converting 2D plans into 3D BIM models, importing and integrating external models , and adding BIM components such as walls, doors, windows, and materials. I also learned how to create documentation sets, generate schedules, and review BIM projects to ensure accuracy and efficiency.

Through guided exercises and real-time project work, I gained hands-on experience in using BricsCAD as a BIM tool, which enhanced both my technical and professional skills. This internship has equipped me with practical knowledge, improved my problem-solving ability, and prepared me for future roles in the **Architecture, Engineering, and Construction** industry.

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Figure 1.1: DesignSense Logo

1.1 Profile:

DesignSense Software Technologies Pvt. Ltd. Bengaluru, INDIA was founded in the year **2013** and is the nation-wide distributor for **BricsCAD and other Bricsys products in India.** We have successfully completed 12 years of representing Bricsys in India, both as a developer and sales-support point for BricsCAD.

1.2 Mission:

We help bring innovative shortcuts, tips and tricks into our customer workflow to make their core CAD design process efficient. Automation is our key mission. We look at automating every possible piece of the customer workflow to help them finish their tasks in a fast, efficient and predictable manner.

1.3 Vision:

We are a sales company because we want to interact with a wide variety of customers

and provide them platform solutions. We are a CAD development company also, and by virtue of that, we deliver the best possible automation solutions for our

customers. Our vision is to see our customers let the computer and CAD software do all the boring repetitive tasks, while the designers focus on the core and creative tasks

1.4 Core values:

At DesignSense we work with integrity in everything we do, and embody our principles when working with customers, suppliers and colleagues.

1.5 What They Do:

They are also a complete CAD software development company and have created two of the most popular add-ons for the .drawing industry – GeoTools & CADPower, which run on AutoCAD and BricsCAD platforms.

They also offer CAD customization and process automation services for the design and manufacturing industry. Almost all of our industry solutions are on the CAD, GIS and BIM workflow platforms.

1.6 Introduction:

DesignSense Software Technologies, Is a trusted partner in innovative CAD solutions. As the exclusive nationwide distributor for BricsCAD and Bricsys products in India, They bring over 12+ years of expertise in CAD Customization and Automation.

Their Offerings:
BricsCAD Solutions**:** They provide a comprehensive suite of BricsCAD software tailored to meet diverse design needs in 2D, 3D, Civil, Mechanical and BIM.

CADPower: A productivity enhancement tool offering over 400+ Lisp routines and features to supercharge your CAD experience.

GeoTools: A geo-data application designed for professionals in GIS data creation, surveying, mapping, and related fields, enhancing productivity and data management.

CAD-BIM automation: They are passionate about building automation in the design industry. Several of our projects on a daily basis includes building bespoke automation for the CAD design workflows. If there is one single investment for growth you need to do today, it must be in automation and AI.

AX3000 form EDV Software**:** AX3000 is a CAD-based MEP BIM platform that runs on
AutoCAD and BricsCAD BIM

1.7 Industry position & Market presence:

Over the past decade, DesignSense has steadily built its reputation as a trusted CAD partner in India. Competing with global software giants, the company's focus has been on value-driven solutions rather than expensive, license-heavy models. This approach has made DesignSense popular among

- Individual professionals seeking affordable CAD alternatives.
- Small and medium enterprises (SMEs) requiring scalable design solutions
.
- Educational institutions looking to provide students with industry-relevant tools.
- Large organizations in architecture, civil engineering, and manufacturing sectors.
- The company's customer-centric approach, combined with its commitment to continuous innovation, has helped it carve a niche in the highly competitive CAD market.

1.8 Innovation & Development:

Unlike many distributors who solely resell international products, DesignSense invests heavily in R&D and software innovation. Its founder, Rakesh Rao, has been instrumental in developing products like GeoTools and CADPower, which have gained global recognition. These tools address specific gaps in mainstream CAD applications, enabling professionals to work more efficiently and productively.

DesignSense has also embraced the BIM (Building Information Modelling) revolution, offering solutions that help architects, engineers, and contractors collaborate effectively. By integrating global technology with local innovation, the company demonstrates a strong commitment to shaping the future of digital design in India.

1.9 Significance of Internship at DesignSense:

Completing an internship at DesignSense Software Technologies offers students and young professionals a unique opportunity to gain exposure to both internationally recognized CAD platforms and indigenously developed tools. Interns are able to:
Understand the CAD software distribution model and its business significance.
•Gain practical knowledge of tools like BricsCAD, GeoTools, and CADPower.
•Learn how software innovation addresses the real needs of design professionals.
•Experience the dynamics of working in a technology-driven, customer-focused organization.
•Contribute to projects that combine software development, technical support, and design problem solving.
This dual exposure—both technical and business-oriented—makes internships at DesignSense especially valuable for individuals aiming to build careers in CAD software development, civil engineering design, or related IT industries

1.10 Conclusion:

DesignSense Software Technologies stands as a pioneering company in India's CAD ecosystem, blending global partnerships with local innovation. Its role as the exclusive distributor of BricsCAD, combined with its development of specialized plug-ins like GeoTools and CADPower, highlights its versatility and forward looking vision.

For interns, the organization provides a fertile learning environment where theoretical knowledge meets practical application. By working with a company at the intersection of technology, design, and innovation, interns not only enhance their technical proficiency but also develop a broader understanding of how CAD solutions drive efficiency in real world projects.

Chapter 2: Product Portfolio – DesignSense Software Technology

DesignSense Software Technologies is a leading provider of CAD/BIM/Mechanical solutions in India, acting as the exclusive nationwide distributor for Bricsys products, and offering proprietary productivity tools and automation services. Below is a detailed breakdown of product / solution portfolio:

2.1 BricsCAD Lite:

BricsCAD Lite is the entry-level edition of the BricsCAD family, designed primarily for 2D drafting and detailing. It offers a familiar environment for users migrating from other CAD platforms, with full support for the industry-standard DWG format. Unlike many "LT" products, BricsCAD Lite allows LISP customization**,** enabling automation of repetitive tasks and improved workflow efficiency. The software is lightweight, cost-effective, and ideal for consultants, architects, and small businesses that need reliable drafting without the overhead of advanced 3D tools. Its interface is intuitive, reducing the learning curve for users transitioning from AutoCAD. The product also benefits from continuous development by Bricsys, ensuring compatibility and performance improvements with every release. For organizations focused purely on precision 2D documentation, BricsCAD Lite represents a robust and affordable choice.

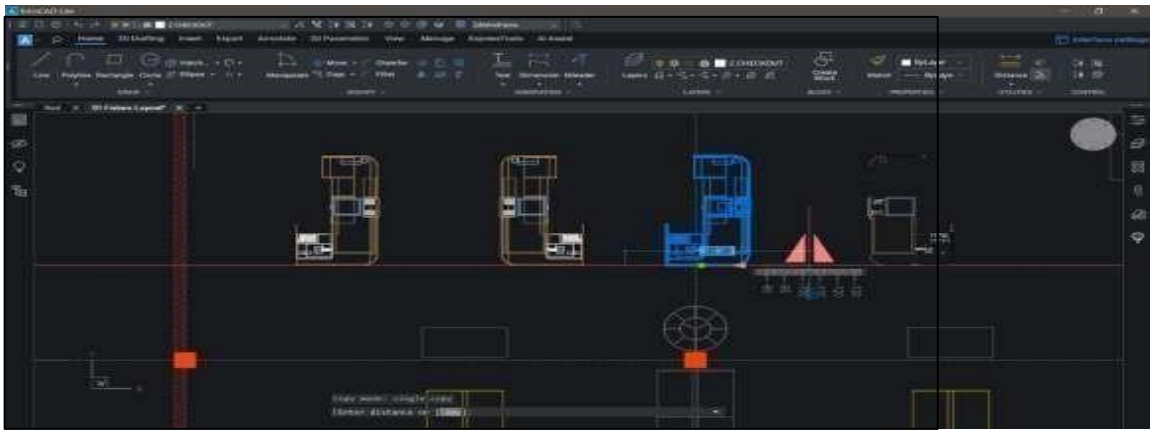

Figure 2.1: BricsCAD Lite Interface

2.2 BricsCAD Pro:

BricsCAD Pro expands upon the Lite edition by adding advanced 3D modelling and parametric design capabilities. It is a versatile platform for professionals who work in **both 2D and 3D,** providing tools for solid, surface, and mesh modelling. One of its key strengths is the powerful 3D constraint engine, which allows for intelligent parametric designs. It also supports point cloud visualization, enabling designers to work directly with laser-scanned data for renovation or infrastructure projects. **Civil and surface modelling tools, such as TIN surfaces,** further extend its applicability

to civil engineering and land development projects. BricsCAD Pro is also the foundation for BricsCAD BIM and Mechanical, making it the core edition for multidisciplinary workflows. With its balance of affordability, DWG compatibility, and robust features, BricsCAD Pro is well-suited for organizations that need more than drafting but do not require specialized BIM or mechanical modules.

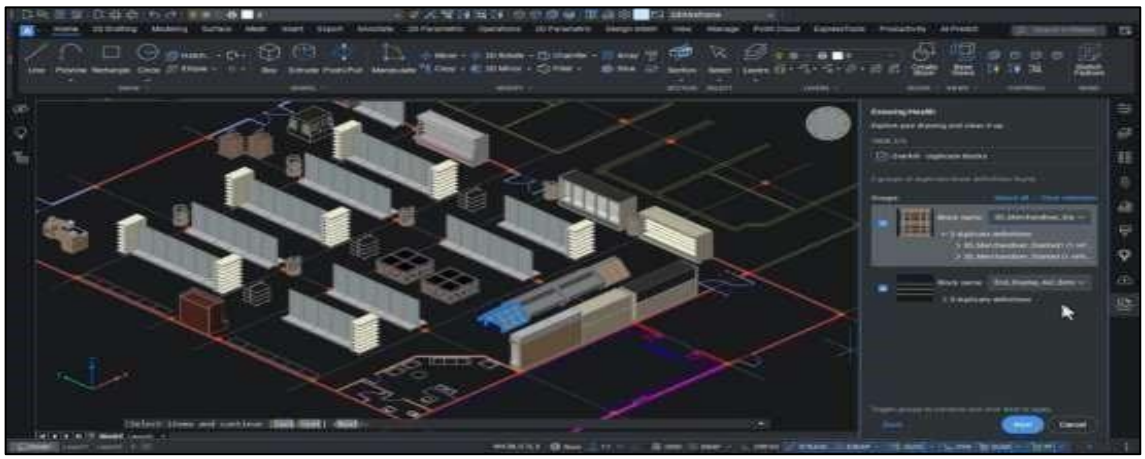

Figure 2.2: Brics CAD Pro Interface

2.3 BricsCAD Mechanical:

BricsCAD Mechanical is tailored specifically for the needs of mechanical engineers and product designers. It offers a complete toolset for 3D parametric modelling, assemblies, and sheet metal design within the DWG environment. One standout feature is its support for assembly modelling, allowing designers to create and manage complex product structures. **The software includes tools for unfolded sheet metal designs, bend tables, and automatic BOM (Bill of Materials) generation.** Exploded views and assembly documentation features streamline the manufacturing preparation process. Because it builds on BricsCAD Pro, Mechanical users also benefit from all general CAD features while gaining specialized tools that rival more expensive mechanical CAD systems. Its compatibility with industry-standard formats, particularly when paired with Communicator, ensures smooth collaboration across different platforms. BricsCAD Mechanical empowers engineers to take concepts through detailed design to **production documentation efficiently and cost-effectively.**

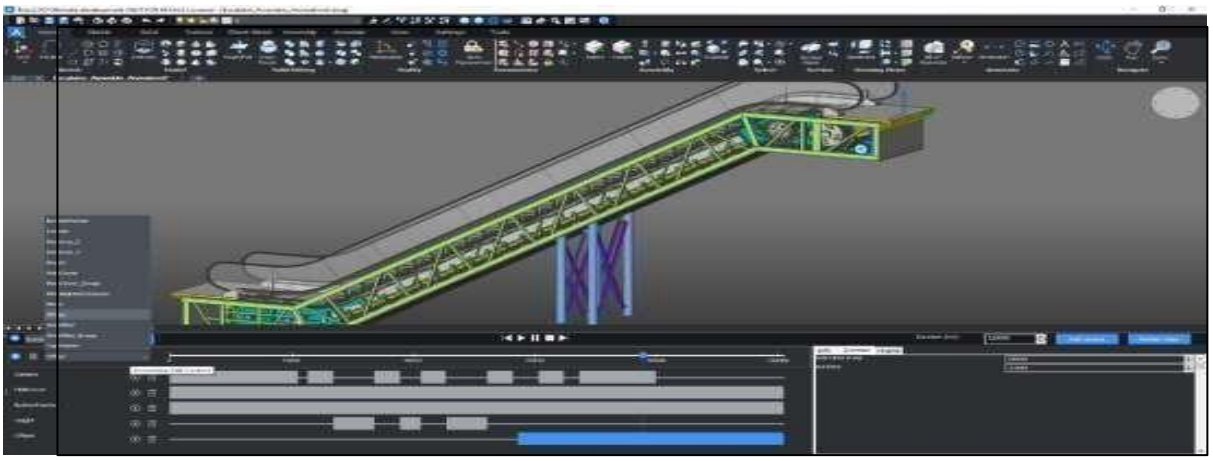

Figure 2.3: Brics CAD Mechanical

2.4 BricsCAD BIM:

BricsCAD BIM provides a unique "Design First" approach to Building Information Modelling, focusing on creative freedom before enforcing classification or standards. Unlike traditional BIM platforms that rely heavily on predefined parametric families, BricsCAD BIM uses CADaccurate solid modelling, giving designers more flexibility and precision. AI-powered tools such as BIMIFY automatically classify building elements into BIM categories, while PROPAGATE replicates design details across a model, reducing repetitive work. It also supports continuous **Level of Development (LOD),** allowing projects to evolve seamlessly from concept to detailed BIM without rework. Full IFC support enables **openBIM collaboration,** ensuring interoperability with other platforms in the AEC ecosystem. The software integrates architecture, structural, and MEP design in a single environment, reducing the need for multiple tools. For firms seeking a costeffective yet powerful BIM solution, BricsCAD BIM provides a strong alternative to established players like Revit or ArchiCAD.

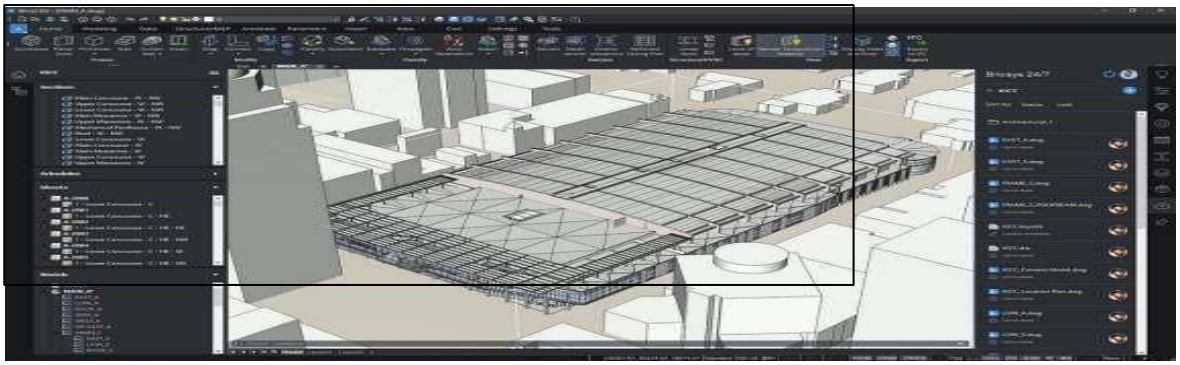

Figure 2.4: BricsCAD BIM

2.5 BricsCAD Ultimate:

BricsCAD Ultimate is the all-in-one package that combines the full functionality of Lite, Pro, Mechanical, and BIM into a single installer and license. It is designed for organizations or professionals who work across multiple disciplines, ensuring that they do not need to choose between drafting, 3D design, mechanical engineering, or BIM. This unified edition simplifies licensing management and provides maximum flexibility in workflows. Teams can seamlessly transition between drafting, product design, and architectural modelling without switching software. The Ultimate package is particularly valuable for large firms or multidisciplinary consultancies, where different departments require different tools but prefer to maintain consistency in their CAD environment. By consolidating all BricsCAD editions, Ultimate ensures maximum ROI and eliminates the need to purchase separate software packages. It also supports the Communicator addon, making it a complete design ecosystem.

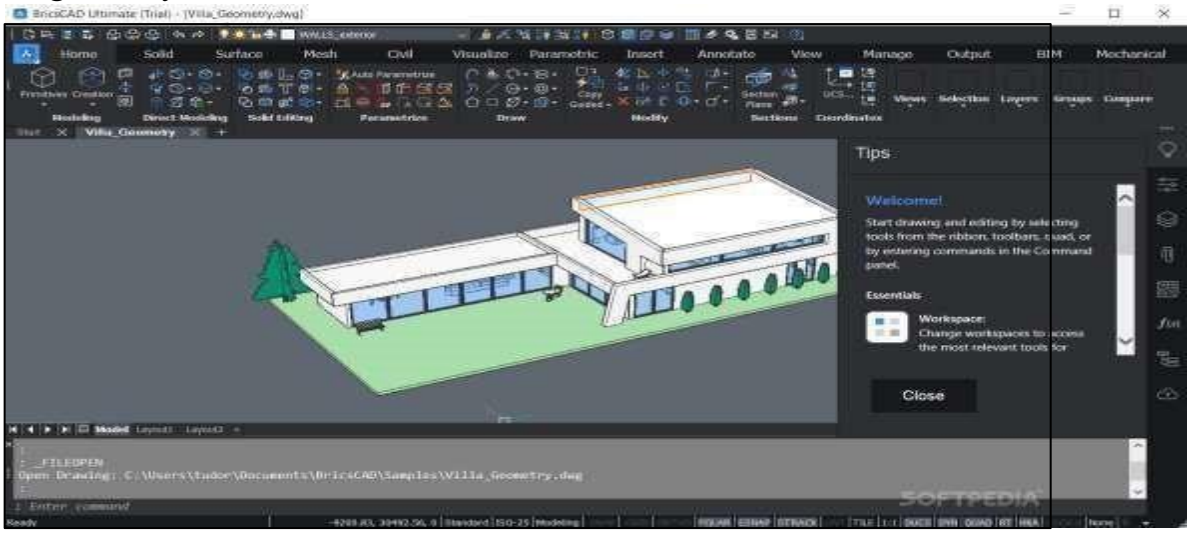

Figure2.5: Brics CAD Ultimate

2.6 Brics CAD Shape:

BricsCAD Shape is a free conceptual modelling tool derived from the BricsCAD platform. It offers an intuitive push-pull modelling interface that enables users to quickly create and modify 3D concepts without being bogged down by technical constraints. Shape is intended for architects, designers, and students who want to sketch ideas in 3D before committing to detailed design. The tool includes a library of parametric objects such as walls, doors, and windows, helping users build space quickly. Since Shape is DWG based, designs created here can be opened directly in BricsCAD Pro or BIM for further development. Despite being free, Shape maintains the accuracy and reliability of BricsCAD's modelling engine, making it more precise

than other lightweight conceptual tools. It is an excellent entry point for new users who want to experience BricsCAD's capabilities before upgrading to paid editions.

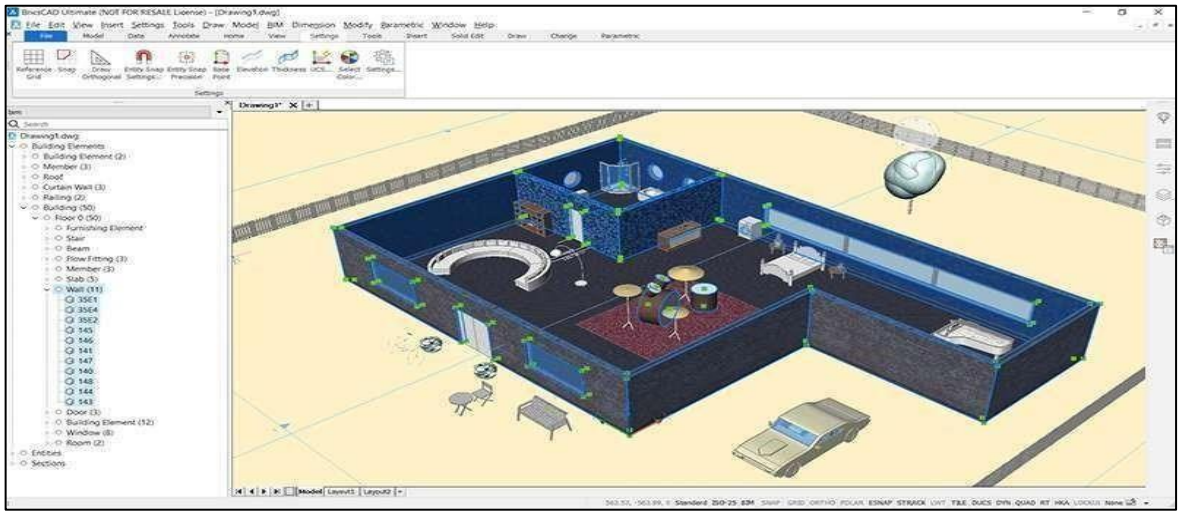

Figure 2.6: Brics CAD Shape

INTRODUCTION

The internship program at **Designsence Company** provided me with a valuable opportunity to gain practical exposure to the field of **Building Information Modelling (BIM)** using **BricsCAD** software. This internship was designed to bridge the gap between theoretical knowledge acquired in academics and its practical implementation in the real world.

BricsCAD, an advanced CAD and BIM platform, is widely used in the **Architecture, Engineering, and Construction (AEC)** industry for creating precise 2D drawings, intelligent 3D models, and comprehensive BIM projects. With the construction industry rapidly transitioning towards digital workflows, mastering BIM tools has become a crucial skill for professionals aspiring to work in modern design and construction environments.

The training at Designsense was carefully structured into two phases. The **first phase** focused on building foundational skills such as understanding the BricsCAD interface, working with 2D drafting tools, and gaining basic knowledge of 3D modelling. This helped me develop confidence in using the software for creating simple plans and models. The **second phase** introduced advanced concepts in BIM, including project setup, importing and working with external file formats (DWG, IFC), creating 3D BIM models from 2D plans, and adding essential BIM components such as walls, doors, windows, and materials. Furthermore, I also learned how to generate construction documentation sets and schedules, which are critical for real-life projects.

This internship not only enhanced my technical expertise but also improved my ability to think critically about design workflows, construction documentation, and

collaboration between multiple disciplines. By working on real-time exercises and project assignments, I gained hands-on experience that has prepared me for future professional roles in BIM-based design and construction projects.

OBJECTIVES

- To gain experience in **adding BIM components** such as walls, doors, windows, slabs, and assigning materials.
- To practice creating **documentation sets** like plans, sections, elevations, and schedules directly from the model.
- To apply the skills learned on **real-time project tasks** and build problem-solving ability.
- To gain a clear understanding of Building Information Modeling (BIM) concepts and workflows.
- To develop practical skills in 2D drafting and 3D modeling using BricsCAD BIM software.
- To understand how to organize BIM projects and manage building components effectively.
- To learn how to create, annotate, and document architectural models.

PHASE 1:

BASICS OF MODELLING:

During my internship, I started by understanding the BricsCAD BIM interface, which is designed to be both familiar and efficient for new users. The workspace has a clean layout with a ribbon menu, toolbars, command line, and a drawing area that allows users to perform both 2D drafting and 3D modelling seamlessly.

The ribbon interface organizes all tools into tabs such as *Home, Draw, Modify, Annotate,* and *BIM*. Each tab provides quick access to frequently used commands. The command line is an essential feature that lets users type commands directly, providing precision and flexibility in operations.

I learned about the status bar located at the bottom of the interface, which helps control settings such as grid, snap, ortho, and object tracking.

The properties panel is another important element that displays all editable attributes of selected objects—like layer, color, linetype, and material—making it easier to modify elements quickly.

The tool palettes offer categorized access to common tools and BIM components such as walls, doors, windows, and slabs. I also learned to customize these palettes to suit different modelling tasks.

Navigation in BricsCAD was made easy with tools like Zoom, Pan, and Orbit, which helped me view models from different angles and scales. I practiced working with views and UCS (User Coordinate System) to position models accurately in 3D space.

In addition, I explored the Quad Cursor, a unique feature in BricsCAD that provides context-sensitive commands directly at the cursor location. This reduced the need to search for commands in the ribbon and significantly improved modelling efficiency.

Overall, learning the BricsCAD interface and tools gave me a strong foundation to proceed with 2D and 3D modelling tasks. It helped me understand how to efficientlymanage the workspace, access commands, and navigate through models

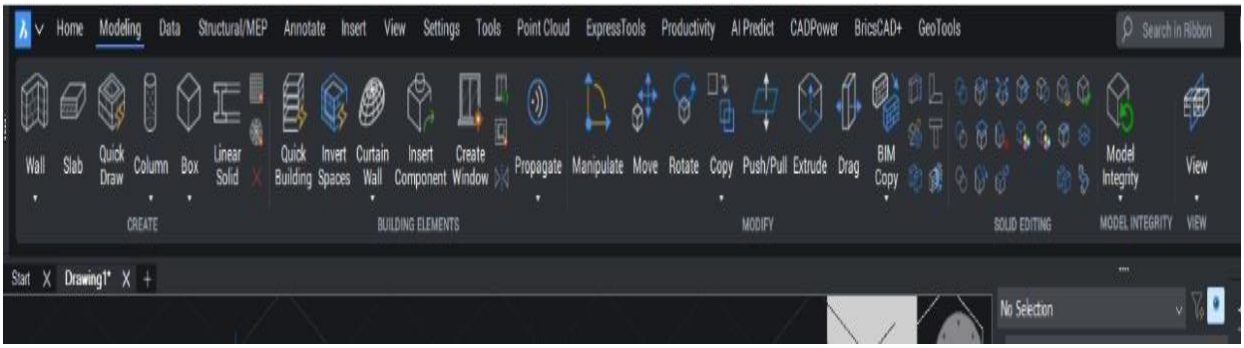

Figure 2.7:Tools used in BRICSCAD

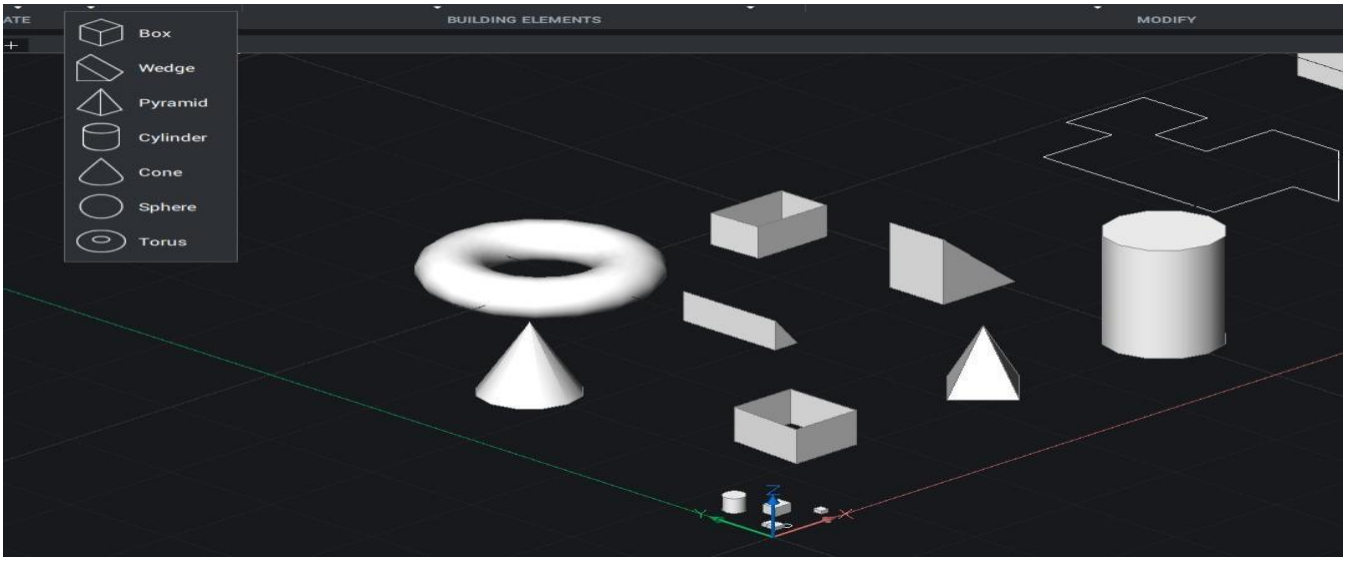

Figure 2.8: Simple shapes drawn using BRICSCAD

PHASE-2:

USE OF QUICK DRAW:

What is “Quick Draw”?

- The BIMQUICKDRAW command in BricsCAD BIM lets you quickly create and edit rectangular and L-shaped rooms or building footprints**.**
- As described on the Bricsys blog:
- Pick a starting point. Drag the cursor and click to define the room’s footprint. Place the Quickdraw cursor inside the existing building to create more rooms. To add a floor or flat roof to the building, click the plus arrow and select from the options.
- It uses a live-preview (e.g., a blue shape) so you see the room outline before placing it. It’s only available in certain license levels: at least the BIM level of BricsCAD (or Ultimate which includes BIM)

How to use it?

Here are simplified steps:

1. In BricsCAD BIM, type BIMQUICKDRAW (or select the Quick Draw tool) to activate it.
2. Pick a starting point in the drawing.
3. Move the cursor to define the room’s footprint (drag to size) and click to set it.
4. If you already have a building footprint and want to add a new room inside, you can place the cursor inside the existing footprint and click/drag.
5. Optionally, you can add a floor or flat roof via a “plus” arrow or supplementary option in the tool.
6. There are extra features: e.g., you can remove a section of an existing wall by aligning the cursor and dragging outside of existing building to create an L-shaped room.

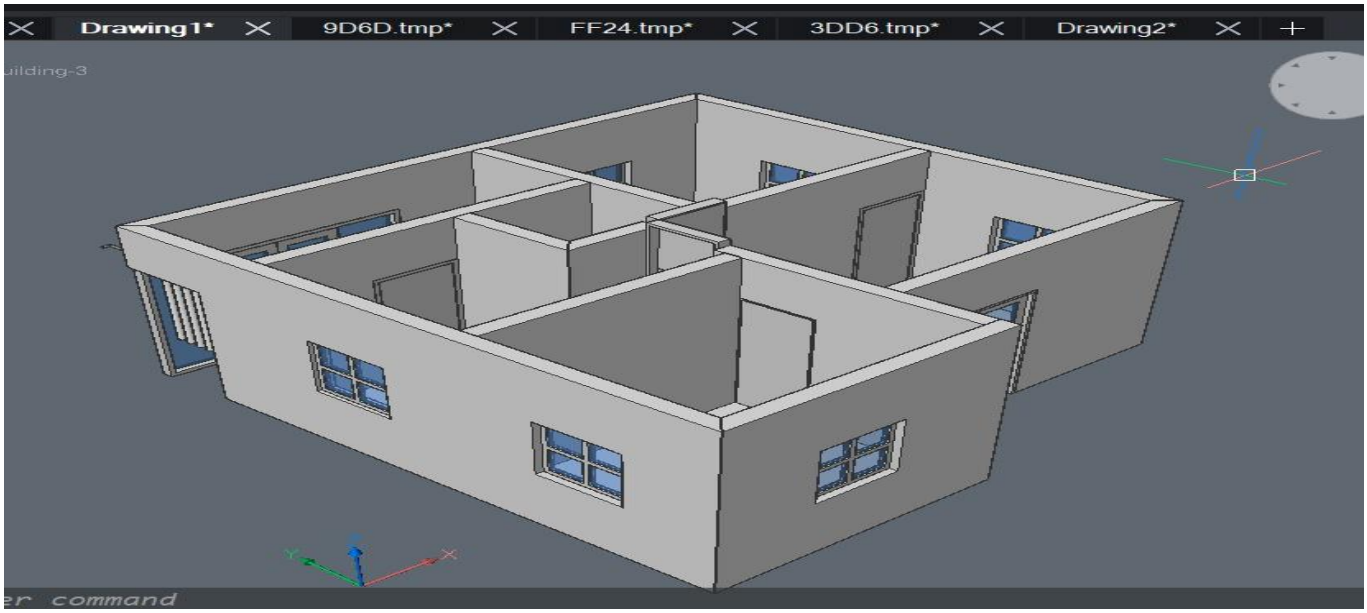

Figure 2.9:Use of Quick Draw feature in BRICSCAD

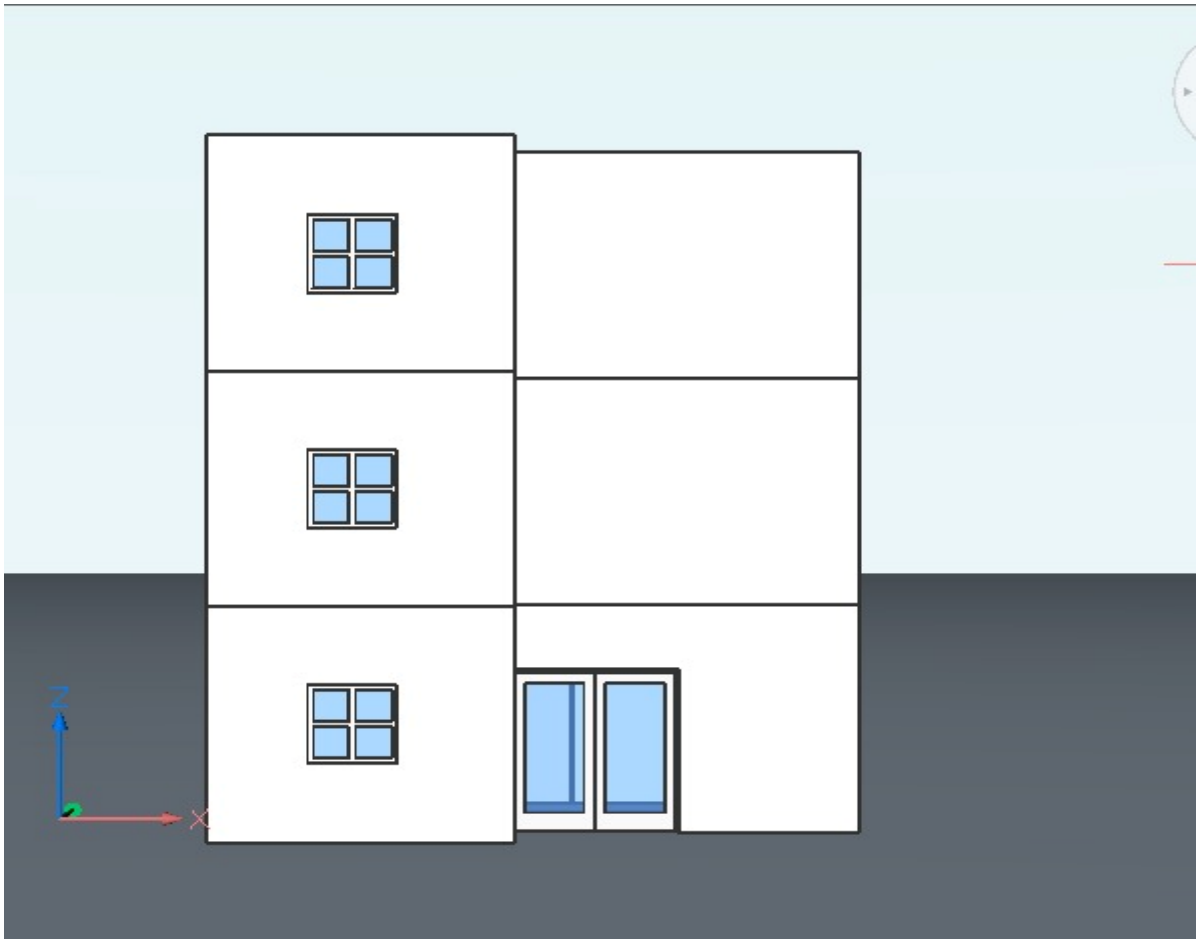

Figure 2.10:Analysing base plan with the use of Quick Draw feature in BRICSCAD

PHASE-3

REPORTING:

During the final phase of our internship at **DesignSense**, we focused on consolidating all the knowledge and skills gained from earlier project stages into a comprehensive report. This involved documenting our workflow in **BricsCAD**, including 2D drafting, 3D modeling, and the use of advanced features such as **Quick Draw** for rapid architectural layout creation. We analyzed design iterations, project challenges, and solutions implemented during the process. The phase also included compiling data, drawings, and outputs to ensure that each stage of our design process was clearly recorded and could be referenced for future improvements or training purposes.

In addition to technical documentation, this phase emphasized **reflection and evaluation**. We reviewed our performance, identified areas for optimization within BricsCAD workflows, and summarized key learnings from working under DesignSense's guidance. Our final submission included structured reports, annotated drawings, and a brief presentation outlining how BricsCAD tools enhanced productivity and design accuracy. This concluding stage not only reinforced our technical proficiency but also strengthened our ability to communicate design intent professionally and effectively.

CHAPTER-3:RESULTS AND CONCLUSION

3.1 RESULTS:

The internship at DesignSense resulted in a comprehensive understanding of BricsCAD's capabilities across drafting, 3D modeling**,** and BIM applications. Through hands-on project assignments, we learned to use tools such as Quick Draw**,** Blockify, and parametric modeling to create efficient and precise building layouts. Our ability to convert conceptual sketches into detailed digital models improved significantly, reducing modeling time and increasing design accuracy. We also gained exposure to real-world project workflows, learning how BricsCAD integrates into the broader design and documentation pipeline used by professional firms.

In terms of measurable outcomes, our team produced a series of optimized floor plans, 3D models, and design documentation that demonstrated improved consistency and clarity. Using automated features in BricsCAD, we were able to minimize repetitive tasks and standardize our drawing practices, resulting in a notable improvement in productivity. Collaboration within the design team also became more effective as we learned to manage and share BricsCAD files efficiently, ensuring version control and data integrity throughout the design process.

Overall, the internship enhanced our technical proficiency, problem-solving ability, and understanding of digital design workflows. We developed stronger visualization and presentation skills, learned to adapt quickly to professional software environments, and gained practical insights into the expectations of the design industry. This experience not only deepened our knowledge of CAD-based design but also prepared us for future roles in architecture, engineering, and construction where tools like BricsCAD play a central role in delivering innovative and precise design solutions.

3.2 CONCLUSION:

The internship at DesignSense Software Technologies was an invaluable experience that bridged academic knowledge and industrial practices in mechanical design and CAD software applications.

The following conclusions can be drawn from the work performed and the knowledge gained:

• DesignSense's role as a national distributor and innovator in CAD software provided a fertile learning environment, especially through involvement in their extensive product portfolio including BricsCAD Mechanical and BIM tools. The opportunity to work with cutting-edge software, integrated with local customization efforts, allowed an appreciation of both global technological trends and regional market needs.

• Hands-on practice in valve design—covering everything from fundamental concepts to detailed 3D modeling and documentation—highlighted critical design considerations such as material selection, structural integrity, and compliance with industry standards. This practical validation of mechanical engineering principles was enhanced by direct participation in design verification and validation processes.

• The industrial visit underscored the importance of collaboration between design engineers and manufacturing teams, emphasizing quality assurance and adherence to international certifications. This reinforced the need for interdisciplinary knowledge and communication skills in professional engineering roles.

Overall, the internship significantly advanced technical competencies in CAD and valve engineering while fostering soft skills such as teamwork, communication, and client engagement. The experience has prepared for future career challenges by instilling confidence in applying engineering principles through modern design tools and industry practices.

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