

**Bentley**<sup>®</sup>  
*Advancing* Infrastructure

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# INTERNSHIP REPORT

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TEJAS KUNKOLIENKAR  
1923



# REPORT OF INTERNSHIP DONE AT BENTLEY SYSTEMS, PUNE

SUBMITTED BY:

**Tejas Kunkolienkar**

1923

UNDER THE GUIDANCE OF

**Mr. Shashank Gokhale**

(Senior Manager, Bentley Systems)

**Mr. Niraj Patel**

(Software Engineer II, Bentley Systems)



# Internship Certificate



17 May 2022

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that Mr. Tejas Kunkolienkar is an Intern employee of Bentley System India Private Limited ("Company"). His internship tenure period is from 17 January 2022 to 15 July 2022 and is working as an Intern, Software Engineering at the Pune office.

This certificate is being issued to Mr. Tejas Kunkolienkar as a confirmation internship with Bentley System India Private Limited for Education purposes.

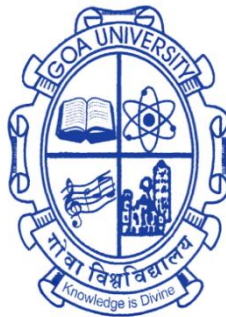
**For, Bentley Systems India Private Limited.**

**Abhishek Bhirwandekar**  
**Manager, HR Shared Services**  
**Tel: +91 - 2067625047**  
**Email: [Abhishek.Bhirwandekar@bentley.com](mailto:Abhishek.Bhirwandekar@bentley.com)**

**BENTLEY SYSTEMS INDIA PRIVATE LIMITED**

Suite No. 1001 & 1002, WorkWell Suites, 10th Floor, Max House, 1516/338, 339, 340, Village Bahapur, New Delhi-110020  
T +91 11 4902 1100, [www.bentley.com](http://www.bentley.com)  
CIN: U72200DL2000PTC109034

GOA UNIVERSITY



GOA BUSSINESS SCHOOL

## CERTIFICATE OF EVALUATION

This is to certify that **Mr. Tejas Guirish Kunkolienkar** has been evaluated for the project work titled “**Report of Internship at Bentley Systems**” undertaken at **Bentley Systems, Pune**, in partial fulfilment for the award of the degree in Master of Computer Applications.

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Examiner1

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Examiner 2

Date:

Place:

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Dean, GBS, Goa University



## Acknowledgement

The internship opportunity I had with **Bentley Systems, Pune** was a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period.

I would like to thank Ms. Akshata Khandeparkar for referring me in Bentley Systems. I greatly appreciate the time and effort you expended on my behalf.

Bearing in mind previous, I am using this opportunity to express my deepest gratitude and special thanks to My Mentors, Mr. Shashank Gokhale (Senior Manager) and Mr. Niraj Patel (Software Engineer II) who in spite of being extraordinarily busy with their duties, took time out to hear, guide and keep me on the correct path and allowing me to carry out project at their esteemed organization.

I would like to extend my gratitude to Mr. Swasthik D (Graduate Trainee) for being my friend and always helping me out whenever I was in dire need.

I would like to thank Ms. Aniksha Naik (Future Talent Programs Manager), Ms. Amruta Kulkarni (HR Manager, India) and HR team for smooth onboarding process and helping me out whenever I was in need.

I thank Mr. MS Dayanand (Dean, Goa Business School, Goa University), Mr. Ramdas Karmali (Prof. and TPO, MCA, Goa Business School, Goa University), Ms. Jyoti Pawar (Program Director, MCA, Goa Business School, Goa University), Mr. Jarret Steven Anthony Fernandes (Assistant Prof, MCA, Goa Business School, Goa University) and all the faculty of MCA, Goa University for their constant encouragement and support during the project work.

I would like to thank my family and friends the love, support, and encouragement they provided me during this internship.

Finally, I would like to express my gratitude towards the Civil Development Team family who were always ready to help me and guide me in all aspects of life. They have transformed me into a new and renewed person ready to face head-on any challenges that come my way.



## Table of Contents

Internship Certificate.....	2
Certificate of Evaluation.....	3
Acknowledgement .....	4
Introduction .....	6
Company Profile.....	7
Project – OpenRoads SignCAD .....	10
My Contributions .....	13
Tools and Technologies Used.....	14
Internship Timeline.....	16
My Reflections on Internship .....	20
References.....	21



## Introduction

This report is a short description of my full-time internship at Bentley Systems, Pune.

I joined as an Intern at Bentley Systems, Pune. on 17th January 2022 and have been here since then. This report contains necessary information about the organization, and the projects I completed in this internship period.

In the chapters that will follow, I will talk about the company, the work here, the culture, etc. Then, I shall elaborate on the projects I worked on, a brief information about the projects, the modules I built and the tasks I completed in those modules.

This report highlights my learning experience and my contributions to the organization as an intern. This will describe the knowledge that I gained by successfully completing the tasks that were assigned to me.

I'll also be talking about the tools and technologies that were used followed by my internship timeline.

I shall conclude by sharing my experience and how it has helped me to grow, both, on the personal and professional front.

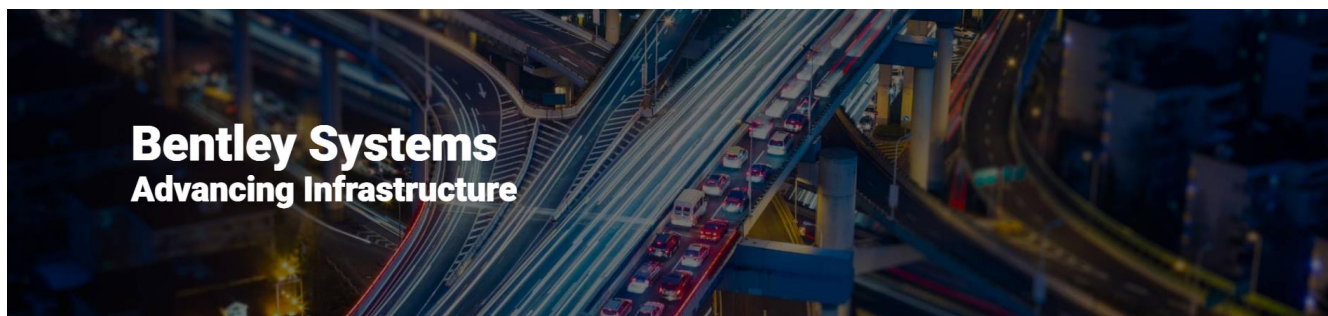
## Company Profile

Company Name: **Bentley Systems, Incorporated**

Corporate Headquarters: Exton, Pennsylvania, U.S.

Website: <https://www.bentley.com/en>

At its core, **Bentley Systems** is a software development company that **supports the professional needs** of those responsible for creating and managing the **world's infrastructure**, including roadways, bridges, airports, skyscrapers, and industrial and power plants, as well as utility networks. Bentley delivers solutions for the entire lifecycle of the infrastructure asset, tailored to the needs of the various professions — the engineers, architects, geospatial professionals, planners, contractors, fabricators, IT managers, operators and maintenance engineers — who will work on and work with that asset over its lifetime. Comprised of integrated applications and services built on an open platform, each solution is designed to ensure that information flows between workflow processes and project team members to enable interoperability and collaboration.



Bentley Systems is the leading global provider of software solutions to engineers, architects, geospatial professionals, constructors, and owner-operators for the design, construction, and operations of infrastructure, including public works, utilities, industrial plants, and digital cities. Bentley Systems employs more than 3,500 colleagues, generates annual revenues of \$700 million in 170 countries, and has invested more than \$1 billion in research, development, and acquisitions since 2014.





## **Bentley's Core Values**

**Connected** - We are connected and able to collaborate with each other throughout our global footprint. This creates a supportive community that brings out the best in us.

**Responsible** - We take pride in our work and hold ourselves accountable for delivering our promises.

**Innovative** - We are teams of innovators who apply technology to deliver creative solutions.

**Motivated** to make an impact - We are committed to improve the quality of life through our contributions to the world's infrastructure.

**Passionate** - We are passionate about the amazing things that our users do with our software, and we are committed to their success.

## **Some of the Products and Services offered by Bentley Systems**

- Civil Design Software
  - OpenRoads
  - OpenRoads Designer
  - OpenRail Designer
- Digital Twins
- Mine Design Software
  - MineCycle Designer
  - MineCycle Survey
  - MineCycle Material Handling
- Plant Design Software
  - OpenPlant
  - OpenPlant Modeler
  - OpenPlant IsoMetrics Manager
- Project Delivery and Collaborative Software
  - ProjectWise 365



- SYNCHRO
- ProjectWise Web View
- Modeling and Visualization Software
  - MicroStation
  - Bentley View
  - LumenRT
- Service Level Agreements and Success Plans: Managed Services
- Solution Implementation, Bim Advancement, And Learning: Professional Services
- Thought Leadership, Best Practices, And Onboarding: Digital Advancement Academies

## Project – OpenRoads SignCAD



# OpenRoads

## CONNECT Edition

### Overview

OpenRoads SignCAD allows to design accurate transportation Signage in minutes. OpenRoads SignCAD does the cutting, layout, and formatting that are necessary for the actual manufacturing, also allowing for direct transfer of relevant information electronically without redundant—and error-producing—sketches or faxes. There is no need for any outside or third-party packages.

#### ➤ **Access Standard Objects, Signs, and Tools**



Access a library of design objects like route markers, arrows, symbols, panels, borders, lines, and fonts. All these smart objects are defined by standard templates, ensuring that they are drawn to your selected standard.

## ➤ Modify and Customize without Sacrificing Timelines



Quickly and easily revise existing signs. It is not necessary to spend hours or start from scratch, as OpenRoads SignCAD's dynamic paneling and automatic dimensioning will adjust dimensions and maintain alignments. Layout dimensions can be manually customized so that, even with automation, users can fully control sign appearance.

## ➤ Comply with State and Federal Signage Standards



Reduce time-consuming, tedious tasks with simple, automated operations using built-in manual of uniform traffic control devices (MUTCD), state, and federal standards.

## ➤ Streamline Design and Manufacturing



OpenRoads SignCAD is your complete solution for sign design and manufacturing. No need for outside or third-party packages and unnecessary rework. It's as easy as one, two, three! Simply:

- Design the signs,
- Select objects to cut,
- Cut the sign directly from OpenRoads SignCAD,
- And you're done!



## **Tools and Technologies Used**

- C#
- C++
- .Net Framework 4.7.2
- Telerik WinForms
- Visual Studio 2019
- SQLite Studio

## My Contributions

At the time of joining, the software had already been developed and most of the features of the software were completed and running, So I was given some tasks to be worked on them also was allocated new features to be added. At the start of internship, my contribution started by understanding and getting hands on the software's used to build the application and followed by the first task of creating files with signs to get hold of a similar application. After that I was assigned with the first actual task of enhancement to the application namely the Connect Licensing Module.

This was followed by fixing defects so that the application would be stable. The defects were related to:

- Text Manager: which allows user to Add text on Rectangular Panels, Lane Controls etc. So added some extra features like symbol dialog, Text Alignment options etc. as well as fixed some bugs in existing Text Manager.
- Property Grid: which allows user to change some properties of elements. Fixed some issues which included incorrect values of some arrows, Panels etc.
- And many more other defects were fixed related to route markers, U-Turn arrows, file save etc.

Also, developed the UI for quick Access toolbar which allows user to access file save, undo, redo, file open from the toolbar and implemented functionality for file save and file open.

I was assigned to work on Enhancement namely the message center. So developed a framework in POC project which was then merged with main branch.

## Tools and Technologies Used



### **C#**

C# is a programming language developed by Microsoft that runs on the .NET Framework and is used to develop web apps, desktop apps, mobile apps, games and much more.



### **C++**

C++ is a general-purpose programming language and is widely used nowadays for competitive programming. It has imperative, object-oriented, and generic programming features. C++ runs on lots of platforms like Windows, Linux, Unix, Mac etc.



### **Telerik**

Telerik is Feature-rich UI component for all .Net and JS frameworks. Professionally designed components and themes for beautiful, engaging and always modern apps.



### **Visual Studio 2019**

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps.



## **.NET Framework**

.NET is a free, cross-platform, open-source developer platform for building many different types of applications. With .NET, you can use multiple languages, editors, and libraries to build for web, mobile, desktop, games, and IoT.



## **SQLite Studio**

SQLiteStudio is a free, open source, multi-platform SQLite database manager written in C++, with use of Qt framework. It is a desktop application for browsing and editing SQLite database files.



## **OneNote**

Microsoft OneNote is a note-taking program for free-form information gathering and multi-user collaboration. It gathers users' notes, drawings, screen clippings and audio commentaries. Notes can be shared with other OneNote users over the Internet or a network.



## **Azure Devops (ADO)**

ADO provides developer services for allowing teams to plan work, collaborate on code development, and build and deploy applications. ADO supports a collaborative culture and set of processes that bring together developers, project managers, and contributors to develop software.





# Internship Timeline

## January

### **Week 1:**

- Onboarding, Introduction and HR induction
- Started to get acquainted with systems/applications used in Bentley Systems

### **Week 2:**

- Started to get familiar with standards, methodologies & naming convention used
- Grasped the product knowledge
- Started with Development Tasks

## February

### **Week 3:**

- Product Task Assigned
- Started working on Enhancement in POC: Connect Licensing (CL)
- CL: Implemented basic login/logout functionality

### **Week 4:**

- CL: Developed UI to show Details of Logged User
- CL: Developed UI for login/logout buttons

### **Week 5:**

- Completed Connect Licensing
- Merged Code with the Branch and Fixed some issues

### **Week 6:**

- Learned Basics of NUnit Testing
- Started working on Quick Access Toolbar (QAT)
- Created and Added QAT to the application.
- Implemented functionality to Open and Save from QAT.



## **March**

### **Week 7:**

- Started working on Enhancement: Connect Licensing Help Documentation
- Implemented the functionality to open Different Tabs of Connect Licensing from OpenRoads

### **Week 8:**

- Started working on Enhancement in POC: Message Center (MSC)
- Developed UI and Created a Class for MSC

### **Week 9:**

- Completed the MSC functionality in POC and Merged in the Branch
- Fixed Issues after merging in Branch
- Started working on Bug fixing
- Started with the Bug: special character dialog in Text Manager

### **Week 10:**

- Developed Ability to place Special character in Text Manager.
- Fixed size issue in Text Manager
- Added Ability to change the background color of Text Area in Text Manager.
- Started with the Resizing Text Manager Bug.

### **Week 11:**

- Developed the ability to Resize the Text Manager.
- Fixed some of the kerning method bugs related to incorrect values.

## **April**

### **Week 12:**

- Started working on developing Text Alignment options in text manager.
- Also, started working/Testing some of the bugs related to Text manager.



### **Week 13:**

- Added the Ability to Select Text Alignment Options in Text Manager.
- Fixed Some Bugs related to Place text where the values were changing unexpectedly and showing incorrect values.

### **Week 14:**

- Fixed an issue regarding symbol dialog and also one issue related to Text manager.
- Carried out some testing on SignCAD application to check for Application crashes
- Work paused for 2-3 days due to expire of VS2019 License

### **Week 15:**

- Fixed an Issue related to Font Stacking of a particular font.
- Started working on Defect: Wherein incorrect values are shown in edit Text dialog

## **May**

### **Week 16:**

- Issued a Telerik Ticket, as encountered a Telerik font Size problem
- Started Working on Enhancement: Notification on Limit Exceed

### **Week 17:**

- Created a sample of the Enhancement.
- Started working on a workaround of the Bug caused due to Telerik problem.
- Helped in completing the Documentation of OpenRoads Designer SDK

### **Week 18:**

- Fixed Bug related to edit Text dialog.



- Fixed More Bugs related to Property Grid, Up Arrow, Double Headed arrow and Standard Signs.
- Started working on Incorrect Panel Size display defect
- Fixed a defect related to file save
- Tested More Bugs

**Week 19:**

- Fixing the Panel Size defect and also working on enhancement
- Fixed a defect related to Up Arrow
- Fixed a defect related to State Highway Route Markers
- Fixed a defect related to Curve U-Turn Arrow
- Tested More Bugs



## My Reflections on Internship

My Internship Period of Six months have been amazing which taught me a lot about Information Technology industry. Last five months in this Company has been truly an amazing and great experience to work in such a well maintained, disciplined and reputed workspace. This was my first step into Corporate Life. It was a completely new environment where I first encountered the transaction between student life and industry life with new roles and responsibilities. The work environment is so casual & friendly that it feels so comfortable.

At Bentley Systems, I was never restricted to just my project team. I was provided freedom to interact, consult seek help and guidance, etc. from any colleague.

In our Civil Development Team, each month we also have a fun filled session called the “Unplugged Session” which is a must as it works as a stress buster.

“A Leader is one who knows the way, goes the way, and shows the way”  
That’s the specialty of our Civil Dev Team, Sir Shashank Gokhale because of whom it was always comfortable to work in any environment. He is one who always guides and gives support to all Members in all aspects.

To Conclude,

“Great teamwork is the only way we create the breakthroughs that define our careers”

That’s how I summarize our “Civil Development Team” in one Line.

I Consider myself honored for being a part of **Bentley Systems**.



## References

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- <https://azure.microsoft.com/en-us/services/devops/#overview>