wyn Enterprise

A Guide for SaaS Providers:

Choosing an Embedded Business Intelligence Solution

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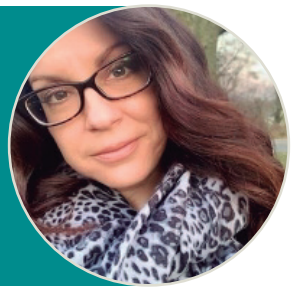
About the authors:



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Introduction:

By 2025, it is expected that 463 exabytes of data will be generated each day globally. While organizations have more data than ever, most cannot leverage it for insights. And with many uncertainties still ahead, the need for an intelligent, intuitive means of analyzing and interpreting real-time data is needed now more than ever. Many organizations are still operating with data silos, using isolated spreadsheets across departments. When data silos exist, so do multiple versions of the truth, resulting in inaccurate intelligence.

Business intelligence and data analytics capabilities are essential across various software applications. Data-driven organizations can anticipate setbacks, make better-informed decisions and get an edge over their competitors—and these capabilities are no longer the exclusive domain of large enterprises. Adding BI features to your applications will improve your products, better serve your customers, and impact your business's bottom line. But where to start? There are many options out there, with no single approach to implementing BI.

> "Information is the **oil** of the 21st century, and **analytics is the combustion engine.**"
>
> — Peter Sondergaard, 2011

Part 1: Traditional vs. Embedded BI

Traditional BI involves implementing data analytics tools in a sophisticated IT environment with data warehousing capabilities. It also requires a skilled IT team to manage the solution and data analysts to aggregate, analyze, and visualize business data and provide key performance indicators (KPIs). While this may work for organizations with those types of resources, it's out of reach for many others, particularly smaller companies.

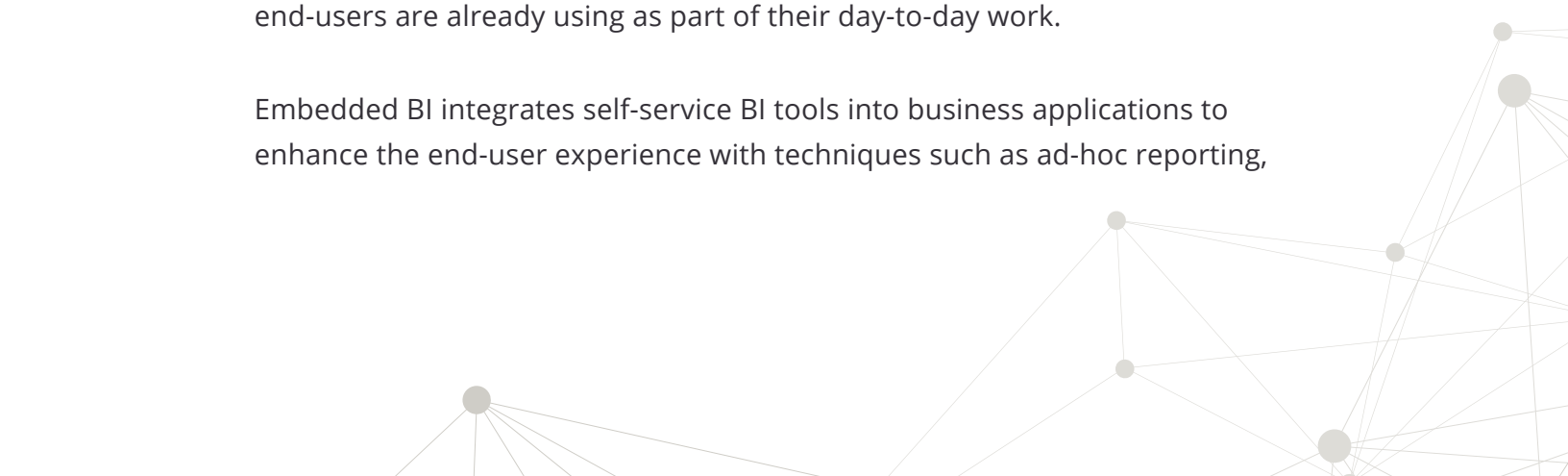
Over time, BI solutions have evolved to include interactive dashboards, allowing end-users to run queries and generate reports. And thanks to cloud-based solutions, business intelligence is now accessible to any size of an organization, regardless of their IT or BI resources.

But even with cloud-based BI solutions, there's still a need to train end-users how to gather value from those interactive dashboards—and the success of the implementation is mainly dependent on end-user adoption. That's why BI is continuing to evolve with innovations such as embedded BI and self-service capabilities. Technology has come a long way in recent years, and it's worth considering options that have evolved beyond traditional approaches.

What is Embedded BI?

The next evolution is embedded BI, integrating business intelligence with business applications and software. Rather than a standalone application, business intelligence features are embedded directly within applications that end-users are already using as part of their day-to-day work.

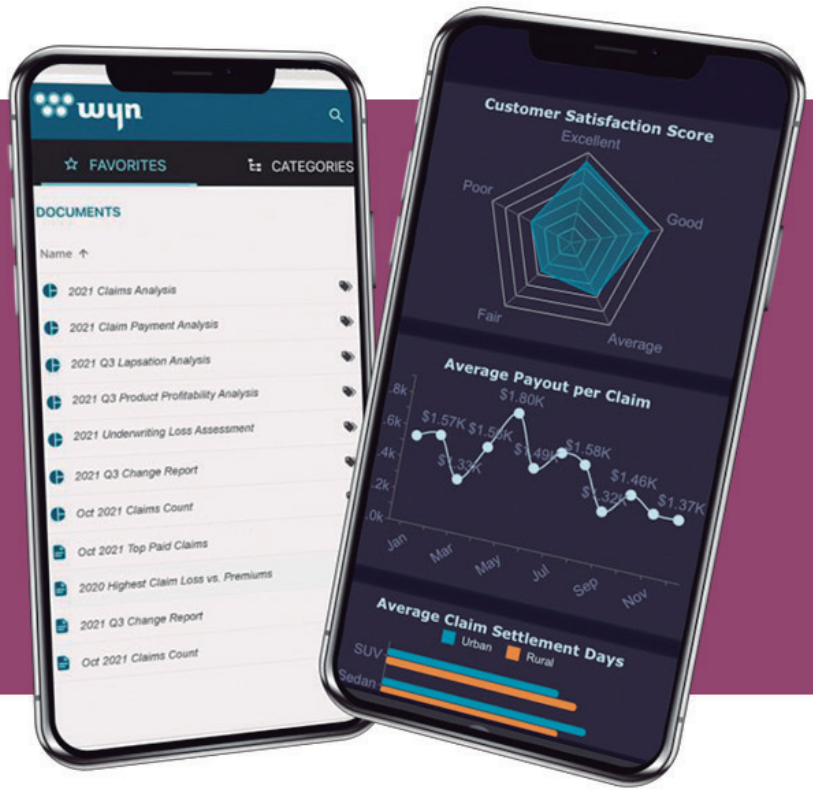
Embedded BI integrates self-service BI tools into business applications to enhance the end-user experience with techniques such as ad-hoc reporting,



interactive dashboards, and data visualizations. Self-service BI tools allow users to analyze business data and present the results of that analysis without waiting for IT to process their requests.

This speeds up the method of gathering data, optimizes decision-making capabilities across the organization, and gives end-users better control over both their data and the way they view it. This is especially critical at a time when remote or hybrid work is becoming the new normal.

Instead of rolling out a new BI platform to every employee, BI capabilities can be woven into existing business applications—reducing end-user push-back and minimizing the learning curve. This also helps to provide relevant information in a familiar environment, resulting in a higher end-user adoption rate and greater productivity.



Part 2: Benefits of Embedded BI

There are many benefits to embedding BI, whether providing end-users with BI tools on their mobile devices or providing actionable KPIs within business applications. By working with multiple data sources, embedded BI can improve insights and metric reporting. And with KPIs and other actionable insights available directly within business applications, end-users can make quicker, better informed, more strategic decisions—while saving time, reducing bottlenecks, and saving IT resources.

Benefits include:

- **Improved business performance:** Embedded BI can significantly enhance an organization's business performance by integrating operations with analytics, allowing end-users to analyze data and take immediate action on their results.
- **Better user engagement:** It also improves end-users ' engagement with the system, allowing them to leverage analytics as part of their standard workflow rather than as a separate process.
- **Data-driven culture:** Self-service BI provides insights for everyone, improves data literacy, and increases team collaboration—allowing everyone in the organization, across all roles, to be independently data-driven.
- **Real-time analysis-based KPIs:** Embedded BI facilitates the improvement of business operations through KPIs, such as allowing a manufacturer to monitor and prevent maintenance problems by identifying patterns in equipment breakdown.
- **Lower costs:** Embedded BI delivers reporting, data visualization, and analytics without the time and expense of building it internally. It can also reduce costs by minimizing onboarding time, learning curves, the need for development and ongoing technical resources, and ongoing maintenance, tech support, and upgrades.

Part 3: Build vs. Buy

Software providers that want to enhance the built-in value of their products by delivering BI capabilities may consider building BI features within their product. Several considerations need to be explored if you plan to add business intelligence features to your software application. The primary concern is understanding the complexities of the BI space and the required ongoing knowledge of the BI industry and its best practices.

Understanding the complexities of the BI space includes:

- Architectural best practices for BI design and implementation
- Data libraries specific to BI, including learning the detail of new data libraries, data management, and data governance best practices
- Best practices of working with large and aggregated data sets
- Data visualization principles, including graphic design principles and their application-specific to BI, and the complexities of interactivity and animation that business users expect
- UI and UX fundamentals that are essential for self-service business intelligence solutions, intended for ad hoc reporting, and use by customers who are not profoundly technical

Part 4: What to Look for in an Embedded BI Solution

Once you've decided to buy an embedded BI solution, carefully investigate all of its features and capabilities. Look for an easily embeddable platform. You don't want your developers spending any more time than necessary integrating the solution into your business or SaaS application. Spend some time looking at the documentation, SDKs, APIs, and other resources for each platform being evaluated to understand any challenges you might face.

Look for an embedded solution that is development platform-agnostic; that can be integrated with platforms such as Java, .NET, .NET Core, PHP, Python.

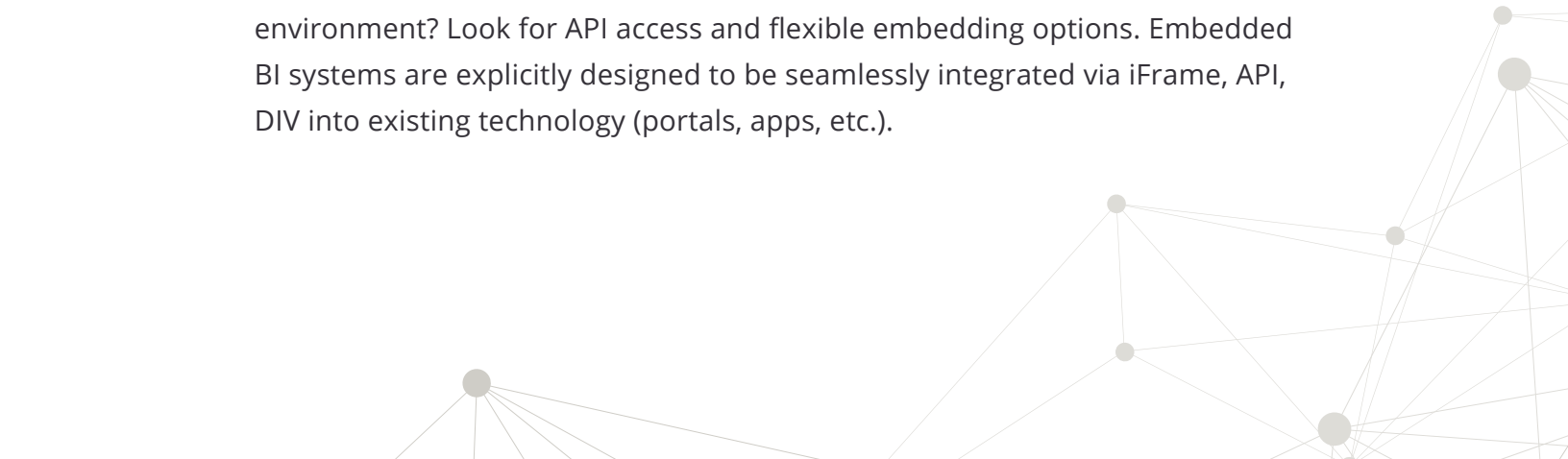
Other notable features:

- Offers OEM white-label embedding
- Supports integration with B/S and C/S architecture systems
- API Integration

Businesses may have unique requirements, but they often need many of the same BI capabilities. When coming up with a strategy for embedded BI, here are some key elements to consider:

API Support

Even if you're buying a self-hosted BI solution that doesn't need to be integrated into any other tool or application, you may want that ability in the future. Does it have the ability to integrate functionality directly into your business applications, so end-users don't have to switch to a particular BI environment? Look for API access and flexible embedding options. Embedded BI systems are explicitly designed to be seamlessly integrated via iFrame, API, DIV into existing technology (portals, apps, etc.).



White-labeling

Many BI solutions on the market don't support extensive customization. Still, if you're planning to embed the solution within an internal business or commercial SaaS application, advanced white-labeling should be on your list of requirements.

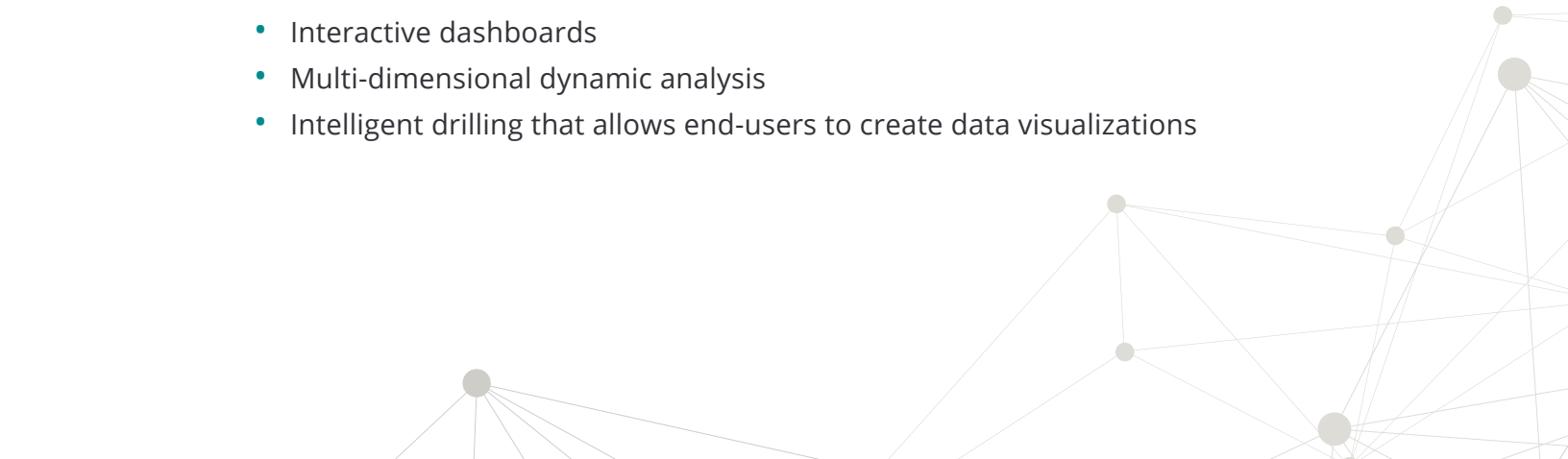
Look for an embedded BI solution that offers custom logos for a login screen, page header logo, mobile logo, and favicon. Advanced white-labeling should provide the ability to customize a third-party solution to fit the look and feel of the application you're embedding it into. For example, you may want to customize it with your company's logo or color scheme, so end-users aren't aware they're using third-party software, and the app maintains a feeling of 'immersion.'

Self-service Capabilities

Self-service BI provides data analytics to every employee—even if they don't have a background in statistical analysis. Look for a tool that empowers technical and non-technical end-users to drill down into data and quickly answer business questions.

The BI platform should feature a user-friendly user UI and UX to encourage end-user adoption, with features for both non-technical business users and technical power users.
The BI platform should include:

- Interactive dashboards
- Multi-dimensional dynamic analysis
- Intelligent drilling that allows end-users to create data visualizations



Look for drag-and-drop controls for self-service, so end-users can easily create their own personalized BI reports and dashboards.

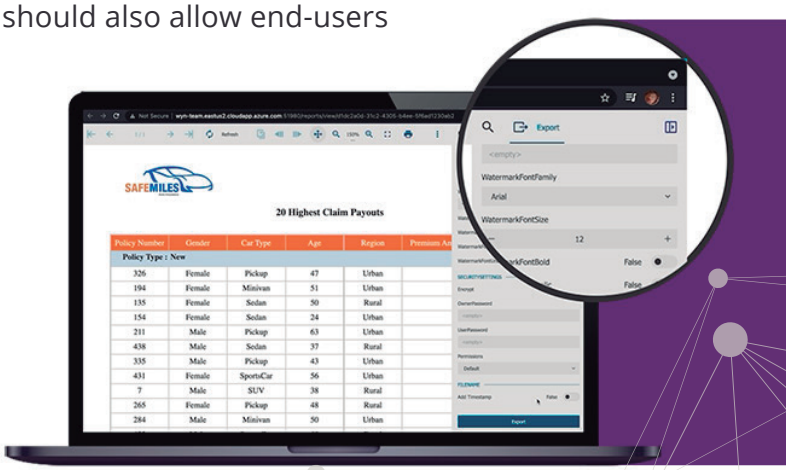
Interactive Dashboards & BI Reports in One Unified Platform

Whether it's your business or your commercial SaaS app, embed Wyn and empower users to design, share, and distribute interactive dashboards and reports.

BI Reporting

Ad-hoc reporting: An embedded self-service BI solution should allow end-users to create their own ad hoc reports and dashboards. So instead of fielding common user requests for dashboard and report changes, IT and dev teams can focus their efforts on curating data.

Custom report designer: The BI solution should also allow end-users to design reports without modifying the software source code. Look for an intuitive report designer with an easy-to-use interface, so users with no prior reporting experience can design highly engaging and interactive reports, and then export them to any format.



Native Multi-tenant Support

A BI platform that natively supports multi-tenancy allows you to manage your BI resources across all customers or tenants from a single environment. Ensure the solution has built-in support for user context, row-level filters, and role-based security.

Wyn, for example, provides built-in support for multi-tenancy so you can reuse functionality, such as creating roles and permissions and then applying them across all of your tenants with no per-user fees. It also allows for data governance and modeling to logically isolate tenant-specific data; for example, rules can be set to restrict the data available to each tenant logged into the same portal.

Part 5: Data Access, Integration, and Management

Is the BI platform compatible with your data? As data grows exponentially, it becomes harder to manage—so it is worthwhile to look for a BI solution that supports multiple data sources (that can host big data). You should also know which data connectors you need and ensure the BI platform supports those connectors. Data sources include databases, cloud data, locally stored file data, and program data such as JSON/OData.

If you want your BI solution to plug directly into your CRM through an integrated connector, your options may be more limited than if you're bringing in data from common data sources such as SQL Server or XML files. And if your data is stored in a Relational Database Management System (RDBMS), you'll need to ensure the BI platform will support this. If your data is file-based, then look for Excel, JSON, CSV and XML support.

Deployment and Security

Data security, privacy, and governance have never been more critical, particularly when dealing with data from multiple sources. Look for a BI solution with security extensibility, meaning it can inherit the authorization and permissions needed to access it from within your business application. SaaS-based applications with multiple tenants should be able to secure resources at the data level.

Each business has different data clearances and authorization needs, so the BI solution should provide multi-level hierarchical security for granular data control. It should also support industry-standard protocols, including OAuth2, OpenID Connect, Active Directory, LDAP, and other federated security systems.

With Wyn, for example, built-in extensibility allows you to integrate BI with virtually any authentication methodology or security system your organization is currently using.

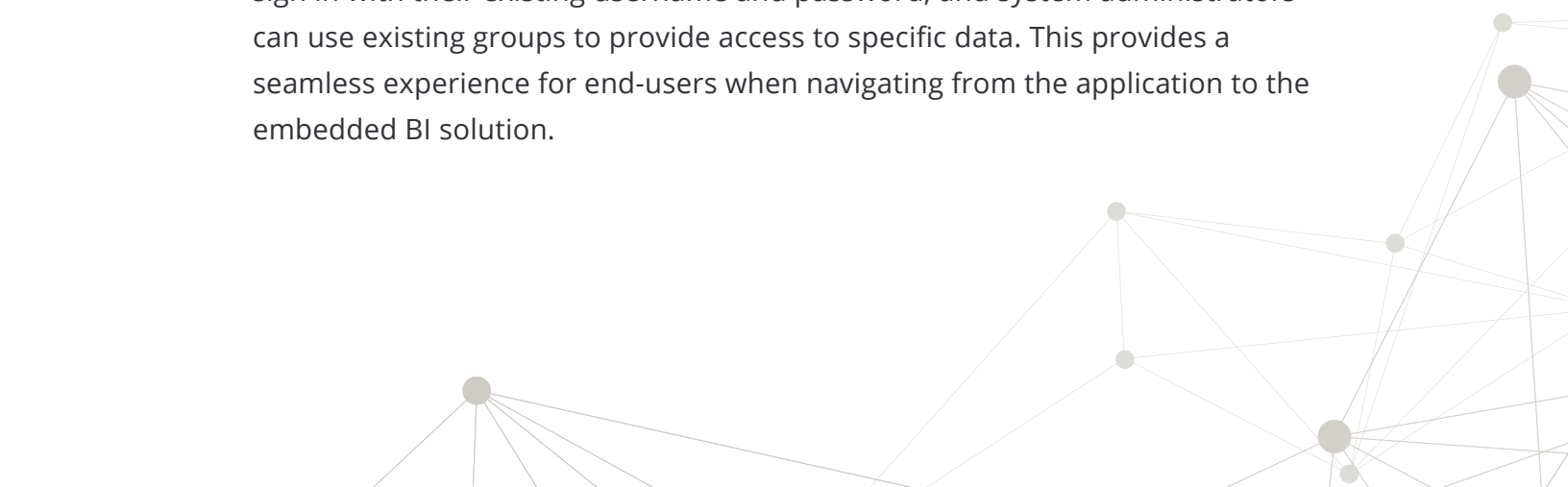
How to Ensure Data and Application Security

Ensure your embedded BI platform has multiple guarantee mechanisms, including:

- The product itself has a comprehensive security check mechanism, such as anti-SQL injection, and URL access authentication.
- The product supports localized deployment and offline operation, and customers can perform security management of the server environment, such as physical isolation deployment using a multi-layer architecture.
- During the operation of the product, there is no need to rely on external servers, nor do they conduct data requests and push operations with external servers.

User Security and Single Sign-on

An embedded BI solution should offer single sign-on security, so end-users can sign in with their existing username and password, and system administrators can use existing groups to provide access to specific data. This provides a seamless experience for end-users when navigating from the application to the embedded BI solution.



Organizations typically group their employees into specific roles or user groups. These employees are then granted access rights to company data and systems in accordance with these roles or groups. The BI platform you choose should offer role-based security, which determines the availability of resources to each employee so, for example, only authorized end-users can create and view certain documents.

For example, Wyn's permissions model grants access privileges to different user roles rather than to individual users. This means you can filter and segregate your data with configurable role-based security and user-context definitions. Role-based permissions decouple access control from document sharing, which allows system administrators to control server load by restricting document creation to only authorized end-users.

Data Governance

Role-based permissions allow system administrators to funnel data to the appropriate end-users. These permissions streamline processes and ensure a smooth end-user experience—while keeping confidential information confidential and ensuring regulatory compliance.

This also serves another purpose: Although many BI reports and dashboards don't contain sensitive data, they may still only be relevant to individual stakeholders. Personnel in HR or finance, for example, don't need to access reports or dashboards focused on marketing campaigns or support metrics.

Part 6: Understanding Total Cost of Ownership

A third-party BI solution should have a simple, straightforward, scalable licensing model so you can quickly and easily calculate the total cost of ownership (TCO). TCO is a term used to describe how much it costs to acquire, operate, and maintain something over the course of its lifetime. Other than the initial price, TCO includes other expenses that may be hidden beneath the surface.

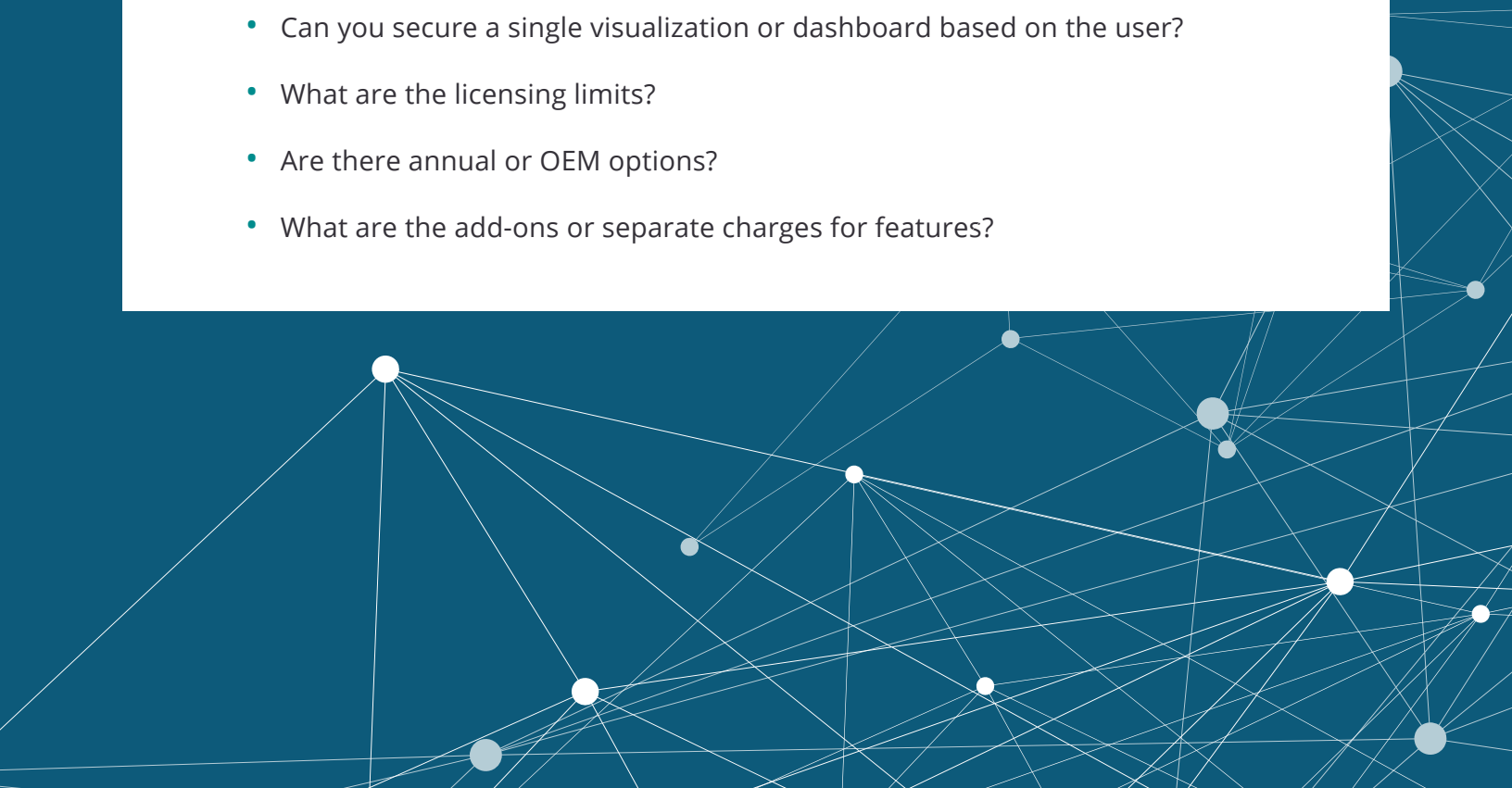
Consider how the TCO could influence pricing—you'll want to make sure the BI platform won't become cost-prohibitive if you need to scale up your operations in the future.

Look for a BI solution with no concurrent user limits or user-based fees so you can continue growing the number of end-users without additional costs. For example, a server-based licensing model allows room for business growth without an increase in end-user fees. With server-based licensing, as your application scales, your licensing fees remain consistent—allowing for predictable annual budgeting with no hidden fees.

Part 7: Questions to Ask BI Vendors

When evaluating and comparing the myriad options available on the market, it's critical to ask the right questions to find the right fit for your organization:

- What are the out-of-the-box features?
- Does the BI platform support custom visualizations?
- How is analytics embedded within the application's user interface?
- Are visual libraries native or third-party?
- Which data sources does it support?
- Will you need to replicate and/or maintain two distinct security models?
- Can you pass tenants, users, roles, and rights via trusted APIs?
- Can you lock down parts of your applications based on user roles and rights?
- Can you secure a single visualization or dashboard based on the user?
- What are the licensing limits?
- Are there annual or OEM options?
- What are the add-ons or separate charges for features?



In Conclusion

Using embedded BI tools, end-users gain fast access to insights from changing conditions: market shifts from government actions, market shifts from competitors' actions, workforce and supply chain disruptions, logistical anomalies, fluctuations in capital markets, and changes in consumer habits. This allows end-users to identify new opportunities as well as threats or 'blips on the radar' and adjust course as necessary.

GrapeCity's embedded BI platform, Wyn Enterprise, provides system integrators and ISVs with a fully customizable, end-to-end BI solution. Wyn offers advanced analytics, interactive dashboards, and reports — in one unified platform. Our lightweight server architecture offers flexible deployment and integration options within any web application.

Wyn has always been embeddable in web applications across a variety of deployment architectures. With comprehensive APIs and integration touch-points, developers can embed the complete BI experience (or parts of it) from Wyn Enterprise Server. This includes viewing and designing dashboards and reports, as well as working with data sources and exploring data.

Add value to your product and help your customer self-serve their reporting and dashboard needs with a fully customizable embedded turnkey BI solution.

Provide users with an easy-to-use BI tool. Embed self-service business intelligence, interactive dashboards, and distributed reporting with no per-user fees or data limitations.

Seamlessly Embed BI Within Your Technology Stack

Designed to be embedded, Wyn is ideal for ISVs, System Integrators, and SaaS product companies with multi-tenant implementations.

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