WHITEPAPER

Integration of HoloLens with TIBCO Spotfire®

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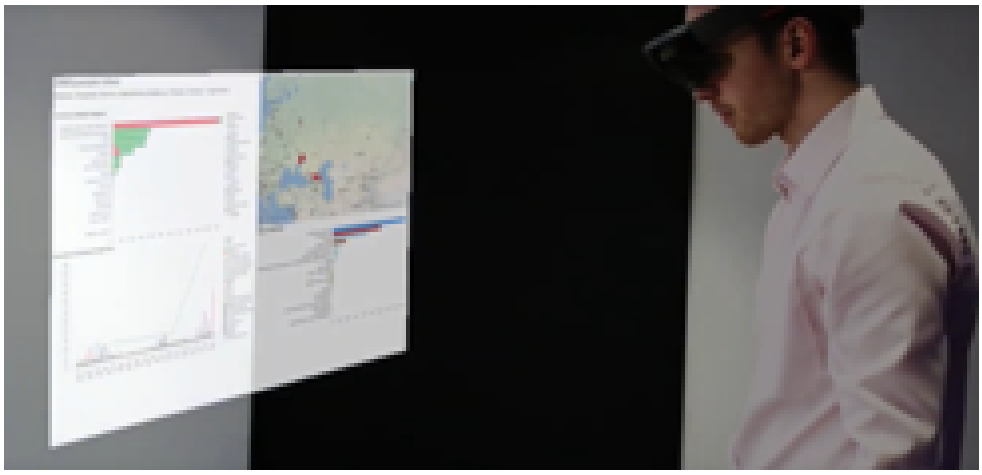
Dattico

Microsoft HoloLens

THE CONTENT



In today's fast-paced data-driven world, companies need to harness the power of real-time data visualization to make informed decisions. TIBCO Spotfire® has long been an important player in providing powerful dashboard solutions that aggregate and display data from diverse sources. However, as businesses' needs have grown, so has the demand for larger and more complex visualizations. This demand has led to challenges in screen space, as users require larger displays to efficiently analyze and interact with data.

This white paper highlights our groundbreaking integration of Microsoft HoloLens with TIBCO Spotfire® to address these challenges. By merging the cutting-edge capabilities of HoloLens with the robust data visualization tools of Spotfire, we offer a revolutionary solution that allows users to interact with data in an immersive, 3D environment. This integration not only solves the screen space issue but also brings a new dimension to data analysis, making it more intuitive and engaging.

STATEMENT

ITIBCO Spotfire® is renowned for its ability to create comprehensive dashboards that draw from a myriad of data sources. These dashboards are indispensable for businesses that rely on real-time data comparisons and visual analytics. As the need for more complex and detailed visualizations has grown, so too has the demand for screen space. Users need to see multiple data sources simultaneously, often requiring them to split these visualizations across multiple screens or large wall displays.

In one notable instance, a company faced significant challenges due to the sheer volume of data being visualized in Spotfire. Management was forced to mandate larger screens for all users interacting with Spotfire dashboards, as smaller screens were deemed insufficient for effective data analysis. As Spotfire evolved, its ability to handle multiple displays became a crucial feature, but the need for even more screen space persisted.

THE LIMITATIONS OF TRADITIONAL DISPLAY SOLUTIONS

While upgrading to larger screens or using multiple displays can temporarily solve the issue, these solutions come with their own set of problems. Larger screens are expensive, consume more energy, and require significant physical space. Furthermore, they limit the flexibility of where data analysis can be conducted, often confining it to designated control rooms equipped with the necessary hardware. This setup is far from ideal for dynamic business environments where decisions need to be made on the fly, potentially at various locations.

PROPOSED SOLUTION

Microsoft HoloLens is the world's first fully self-contained holographic computer. It allows users to interact with high-definition holograms in their real-world environment. By integrating HoloLens with TIBCO Spotfire®, we have developed a solution that transcends the limitations of traditional screen-based displays. Instead of being bound by physical screen space, users can now interact with data in a three-dimensional (3D) space, effectively transforming any room into a control room filled with dynamic, interactive dashboards.

TECHNICAL OVERVIEW OF THE INTEGRATION

DATA VISUALIZATION AND INTERACTION

The core of the integration lies in the ability of HoloLens to project Spotfire visualizations as interactive 3D holograms. Users can view, manipulate, and interact with these holograms using intuitive gestures and voice commands. For instance, a 3D Scatter Plot generated in Spotfire can be viewed through HoloLens, allowing users to zoom in, rotate, and walk through the data points as if they were physical objects in the room.

DATA COMMUNICATION AND PROCESSING

The process begins with the creation of a JSON file containing the necessary data from Spotfire. This file is generated using IronPython scripts within Spotfire and is stored on a TIBCO server. HoloLens retrieves this JSON file and processes it to generate the corresponding holographic visualization.

Interaction with the holograms is facilitated through a series of C# methods that communicate with the Spotfire server. For example, when a user selects data points within a hologram, the selected IDs are sent back to the Spotfire server, which then filters the data and updates the visualization accordingly. The updated dashboard is then sent back to HoloLens, where it is displayed as either an image or a live browser window, depending on the user's needs.

This dynamic interaction between HoloLens and Spotfire is made possible through a custom-built API that handles all communication and processing tasks. The API ensures that data is transferred smoothly between the two platforms, and that visualizations are updated in real-time based on user interactions.

HOLOLENS DISPLAY CAPABILITIES

HoloLens is capable of displaying high-definition holograms with true color and alpha transparency, making it ideal for complex data visualizations. The device supports a resolution of 1536 x 500 pixels, which is sufficient for most Spotfire dashboards. Additionally, HoloLens can handle both static images and live browser windows, giving users the flexibility to choose the best format for their data.

USER INTERACTION AND EXPERIENCE

One of the most significant advantages of this integration is the enhanced user experience. HoloLens allows users to interact with data in ways that were previously impossible with traditional screens. For example, users can "walk through" a 3D Scatter Plot, examining data points from different angles and distances. This level of immersion and interactivity leads to a deeper understanding of the data and enables more informed decision-making.

Moreover, HoloLens supports multi-user interactions, allowing multiple users to view and interact with the same data simultaneously. This feature is particularly useful in collaborative environments, where teams need to work together to analyze data and make decisions. The ability to share and interact with holographic visualizations in real-time creates a more dynamic and engaging workflow.

USE CASE 01: IMMERSIVE 3D SCATTER PLOT VISUALIZATION

Imagine a scenario where a team of data analysts is tasked with examining a large dataset containing thousands of data points. Traditionally, this would require multiple large screens to display the data effectively, with analysts struggling to view and interact with the data in real-time.

With the HoloLens integration, this scenario is transformed. The team members, each wearing a HoloLens, can view the entire 3D Scatter Plot as a hologram in the middle of the room. They can walk around the visualization, zoom in on specific data points, and rotate the plot to see it from different angles. The ability to physically move through the data allows for a level of detail and insight that would be impossible to achieve with traditional screens.

As the analysts identify trends and outliers in the data, they can use hand gestures or voice commands to select and highlight specific data points. These selections are instantly communicated to the Spotfire server, which updates the visualization in real-time. The updated dashboard is then displayed on the HoloLens, allowing the team to continue their analysis without interruption.

This immersive experience not only makes data analysis more efficient but also more intuitive and engaging. The ability to interact with data in a 3D space leads to a deeper understanding of complex datasets and enables faster, more accurate decision-making.

USE CASE 02: MULTI-USER COLLABORATION

lIn a typical business environment, data analysis is often a collaborative effort, requiring input from multiple stakeholders. The HoloLens integration supports this by allowing multiple users to view and interact with the same holographic visualization simultaneously.

For example, in a conference room setting, multiple team members can wear HoloLens devices and participate in a collaborative data analysis session. Each user can interact with the data independently, selecting and highlighting different data points. The selected data is then synchronized across all devices, ensuring that everyone in the room sees the same information.

This multi-user functionality is particularly useful for decision-making processes that require input from various departments. By allowing all stakeholders to interact with the data in real-time, the HoloLens integration facilitates a more collaborative and efficient decision-making process.

USE CASE 03: REMOTE COLLABORATION AND MOBILE INTEGRATION

In today's globalized business environment, teams are often spread across different locations, making remote collaboration a necessity. The HoloLens integration addresses this need by allowing remote users to participate in data analysis sessions from anywhere in the world.

Users can join a session from their PC, mobile device, or another HoloLens. The data is streamed to their device in real-time, allowing them to view and interact with the same holographic visualizations as their colleagues. This remote collaboration feature ensures that all team members, regardless of their location, can contribute to the data analysis process.

Additionally, the integration with mobile devices (both Android and iOS) allows users to access holographic visualizations on the go. This mobile integration is particularly useful for executives and decision-makers who need to stay informed and make decisions while traveling.

Conclusion.

The integration of Microsoft HoloLens with TIBCO Spotfire® represents a significant leap forward in data visualization and interaction. By moving beyond the limitations of traditional screen-based displays, this solution allows users to interact with data in an immersive, 3D environment. The ability to view and manipulate data holographically not only solves the screen space issue but also enhances the overall user experience, making data analysis more intuitive, engaging, and efficient.

Moreover, the HoloLens integration supports multi-user collaboration, both in-person and remotely, ensuring that teams can work together seamlessly, regardless of their location. The mobile integration further extends the capabilities of this solution, allowing users to access holographic visualizations on the go.

In conclusion, the Dattico HoloLens integration with TIBCO Spotfire® could be a game-changer for businesses that rely on real-time data analysis. It offers a flexible, scalable, and innovative solution that meets the evolving needs of today's data-driven world. By embracing this technology, companies can not only improve their data analysis capabilities but also gain a competitive edge in their industry

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