# Web Technologies: Emerging Trends and Current Practices

Introduction – Web applications have evolved greatly over the last decade. A user would be aware of these changes by feeling the increase in ease of use, better design, more intuitive interactive cues, better response times, etc. While these are user facing improvements that a customer is always looking for, in this article Datamatix digs deeper to uncover some of the popular technologies today that are shaping web application development. We trace these technologies from the database back end to the front end. We explore a couple of innovative features in SQL Server 2016. We then follow up with outlining the advantages of following a RESTful architecture. We then talk about AngularJS – a great innovation to design interactive Single Page Applications. Lastly, we give a brief introduction of Windows Azure – the cloud computing offering from Microsoft.

1) SQL Server 16

We could always think about the database as the heart of the application. After all, it is the data housed in this sophisticated location that is the motivation for building the application. SQL Server is the offering from Microsoft for relational databases. Microsoft released the 2016 version early this year a with some exciting new features to further enhance web application performance. Datamatix has always appreciated this evolutionary aspect of SQL Server. One of the introductions into the Database Engine is the concept of **Stretch Database**. To briefly summarize it, SQL Server migrates data that is used less frequently to an Azure database on the cloud. Such data commonly known as cold data, usually ends up stored on the local premise database taking up valuable space but not queried often. Historical data and audit data are some common examples which are often a storage liability on a local database. This data grows fast but is required very rarely. What Stretch Database can do for you is first and foremost, reduce your database storage costs. You can reduce the database size requirement on your local solution and rely on the scalable cloud solution of Azure databases. There is also a reduced maintenance overhead for local premise databases. The cold data can be queried seamlessly just like on-premise data reducing development overhead. The Azure data encryption standards also ensure secure data migration. All in all, Stretch goes a long way in reducing database costs incurred due to huge historic and audit data.
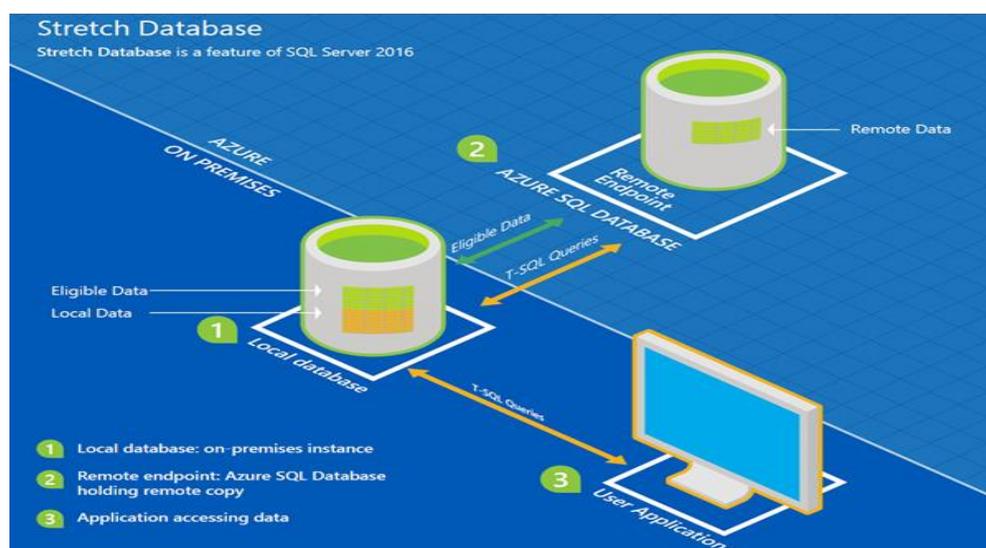
The other exciting feature that we would like to talk about is the **web portal for the Reporting Service**. This will provide brilliant visuals to manage your reporting solution. It comes with a revamped User Interface and an HTML5 rendering engine to target modern browser features. It has features for both web reports and mobile reports as one can briefly observe in the images. The web portal is a great way to manage your applications reporting services, right from creating reports to executing them and subsequently downloading and utilizing them.
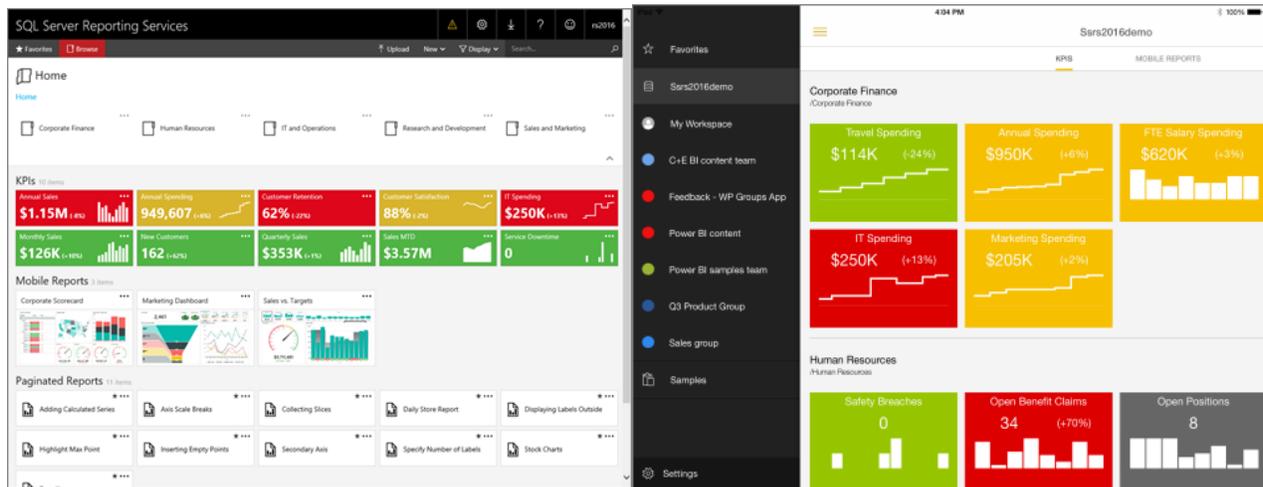

2) Web API

REST and service oriented architecture or **SOA** are popular buzzwords in the web industry today. HTTP is a powerful platform for building APIs that expose services and data. HTTP is simple, flexible, and ubiquitous. HTTP services can reach a broad range of clients, including browsers, mobile devices, and traditional desktop applications. APIs operating over HTTP enable applications to communicate with other applications easily. This communication then helps in seamless consumption of an application services. ASP.NET Web API is a framework for building web APIs on top of the .NET Framework. For better scalability and portability, a RESTful offering is the way to go. Datamatix is keenly interested in providing this flexibility in a software architecture. From a user's perspective, one can be assured of more flexibility in the web application and the confidence of being able to use it on multiple clients. This guarantees a wider range of software at comparatively lower development and maintenance costs. The following image is a good explanation of the value of a RESTful architecture in a web application.
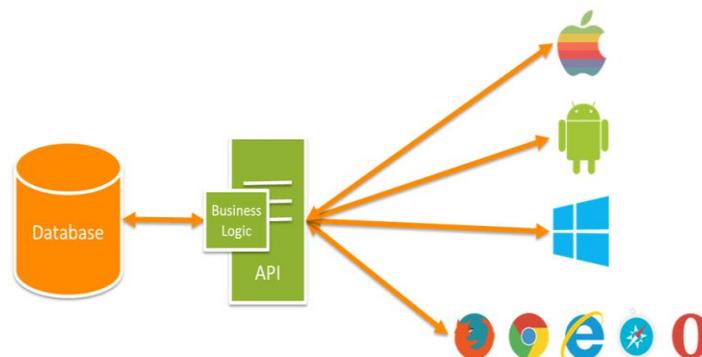
3) AngularJS

With Angular 2 now in beta, we cannot help but highlight the rise of AngularJS. A short description of Angular would be having to put in less efforts to make an amazingly responsive application. It works in great conjunction with Web APIs and uses a concept of data binding to directly work with the DOM. Angular will save you all the pain associated with tons of front end Javascript coding, by ensuring that you do not have to write that code at all. You need not write callbacks and clutter your interactive code. The DOM is manipulated programmatically and is not the headache of the front end developer. This reduces the inconsistencies in which some browsers react to DOM manipulations. The developer need not worry about boilerplate code to move data from front to back and vice versa via AJAX calls. It helps in having a clean maintainable code that outlines the data flow clearly. The value this brings to a web application is far lesser glitches on the user interface due to complex Javascript and AJAX. This may be a complex system to envision, but the following image is a good depiction of the working behind the scenes. It results in an overall far more satisfying experience for the end users, making it an important technology for Datamatix.
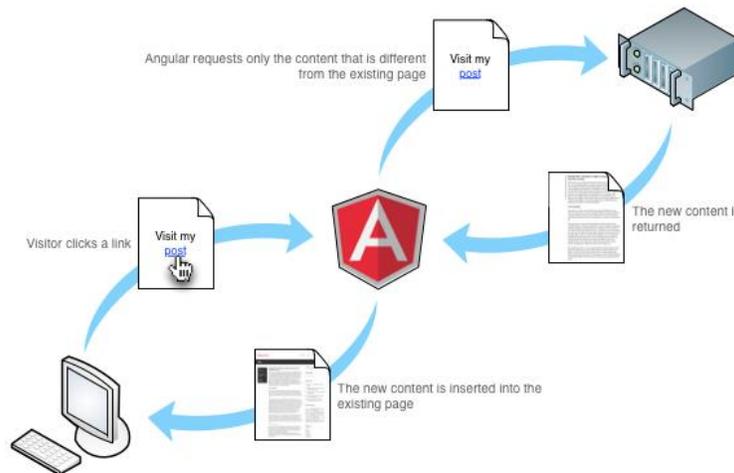
4) Windows Azure

No discussion on emerging trends is complete without the mention of the cloud. Datamatix truly understands the value of the cloud as an organization and also its value for end users. Azure is the cloud offering by Microsoft. While it is beyond the scope of this paper to cover all the features of this cloud computing platform, we can outline the most basic benefits provided by the cloud. In broad terms, the cloud leases computational ability on a requirement basis. The immediate advantage of this is huge savings in building and maintaining infrastructure for any organization. Through different administrative levels such as IaaS, PaaS, etc. an organization is empowered to mimic its infrastructure in cloud as closely as possible and move all its computational capabilities to it. Another important aspect is the charging on a requirement basis. An organization will incur charges only based on the computational capability utilized by them. This means that the servers can scale up or down depending on the demand and consequently good service. Another useful feature made easy by the cloud is easy Continuous Integration and Deployment, which means changes can be pushed to the web application with zero downtime.

Microsoft Azure Cloud Platform
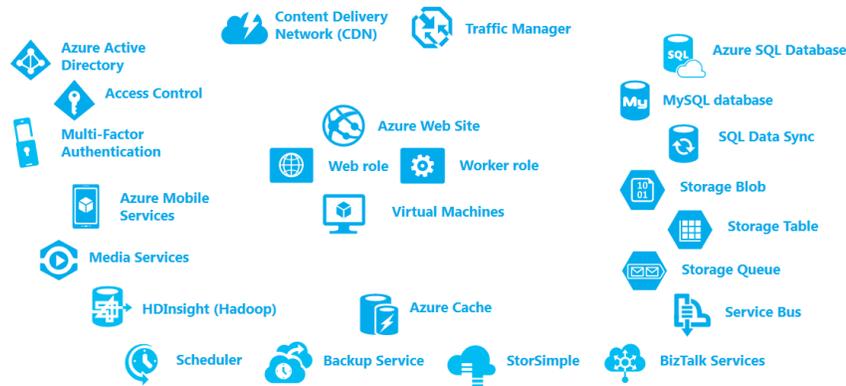
As we can see in the image, which is a comprehensive but not exhaustive list of Azure resources, the cloud can provide all the capabilities of an on-premise infrastructure. But this is at a far lesser cost, as setup and maintenance cost and effort are totally avoided. From a customer standpoint, it is great news as all the needs of scaling and pay-per-request are taken care of through the platform.

Conclusion - Web technologies continually evolve giving rise to better and more competitive products. It is essential to be aware of one's options in a highly competitive market. At Datamatix, we recognize the potential of these technologies both in helping speed up our development efforts and also in increasing our customer satisfaction. We strongly believe that employing these technologies is essential to continue delivering quality software and maintain the bar of excellence we set for ourselves.

List of References –

1) MSDN documentation - https://msdn.microsoft.com/
2) Web API documentation - http://www.asp.net/
3) AngularJS documentation - https://docs.angularjs.org/guide
4) Windows Azure documentation - https://azure.microsoft.com/en-us/get-started/