# INTRODUCTION

This era is an Internet era and no one will disagree with that. Nowadays everything is going online from smaller shopkeepers or fruit sellers to big shopping marts like Wallmart, Amazon, etc. Every industry is online like footwear, books, clothing, food, etc. And the role of a website has played a major role in this transition. Because to take one’s business online there should be some kind of platform available and websites are one of the easiest available options out there.

## 1.1 Conventional Approach For Building Websites:

As mentioned above websites have become tremendously popular but in older times they have been through poor efficiency, poor interactivity, and poor responsiveness overall the websites were not good as websites these days are (Mesbah and Deursen, 2007; Wang et al., 2008). The technology used for building websites was just evolving those days. In an earlier website, on every click pages used to get reload thus reducing ease of use. The websites were used to be a multi-page interface model. So every request has to refresh the whole interface so users had to wait every time they want to retrieve some content.

## 1.2 Evolution of AJAX & SPA

Thus this kind of architecture for building websites today is not recommended so there was a need for some new technology to take over this conventional method. And this new technology is called as savior **AJAX** – Asynchorunus Javascript and XML. Because of this AJAX technology, a new revolution happened in this field of web development. Sometimes it is referred to as web 2.0 (Lin et al., 2012). Using Ajax technology a single page application can build with ease which was highly needed. These single-page applications are composed of the individual component which can be updated, retrieved, removed independently of each other. And because of this, the need to reloading every page on user click or any action is eliminated thus the features lacking in a conventional approach like Interactivity, Responsiveness & User Satisfactions were obtained. (Mesbah and Deursen, 2007). Nowadays organizations and businesses are migrating websites build using an old conventional approach to this newly evolved Single Page Web Application knows as SPA based on AJAX technology. (Mesbah and Deursen, 2007).

## 1.3 SPA Frameworks

Javascript is the most widely known if not most commonly used programming language for the browsers and building high-end web applications. As a result of the use of javascript & AJAX, the Single Page Applications have been evolved. Also, the community for websites is increasing day by days the contribution offered by them is huge resulting in the rise of new frameworks. Because of the increasing use of javascript and AJAX technologies and SPAs so many frameworks got created to support a new approach for building modern websites. For example Angular, ReactJS, Backbone.js, etc.

Using this modern framework helps in various methods while developing the app, it makes us write less & specific code, it improves the efficiency of the codes, removes extra boilerplate code, etc. but as every coin has two sides there are some drawbacks of using frameworks as well. Because of this while deciding the right framework while building a new application or migrating the old application to the new application it becomes a headache for developers. As there are pros and cons in every framework.

So in this work number of **SINGLE PAGE APPLICATION** javascript frameworks are chosen and their performances are mseasured based on various performance factors.