

# Single Page Applications



## Rapid Application Development (RAD)

**RAD** කියන්නේ **fast and flexible software development model** එකකි. Requirements frequently change වන small/medium projects සඳහා සුදුසුය, ඉක්මනින් prototypes develop කරලා, user feedback එකට අනුව refine කරන development method එකකි.

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## Web Application Architecture

Web applications develop කරන විදිහට 2 ප්රධාන ආකාර තියනවා:

1. **SPA - Single Page Applications**
  2. **MPA - Multi Page Applications**
- 



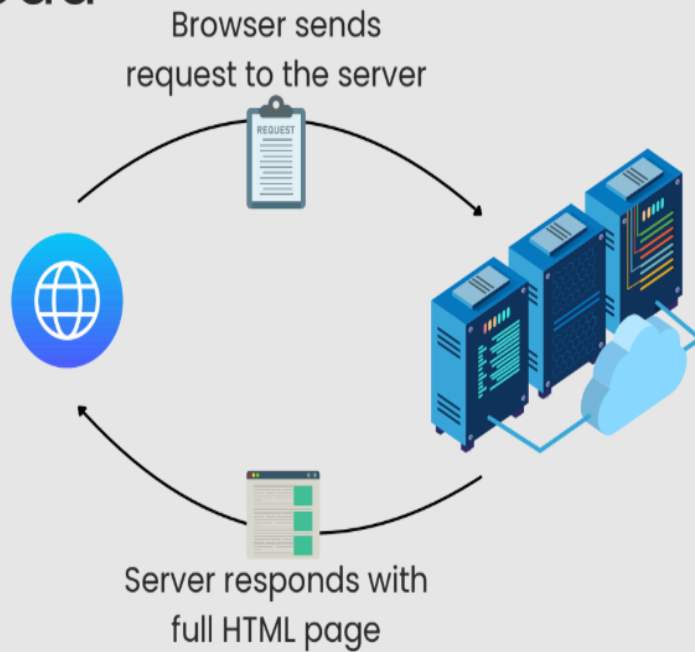
## MPA (Multi Page Application)

An MPA loads a new HTML page from the server for each user interaction that requires updated content. This results in a full-page reload for every navigation or action.

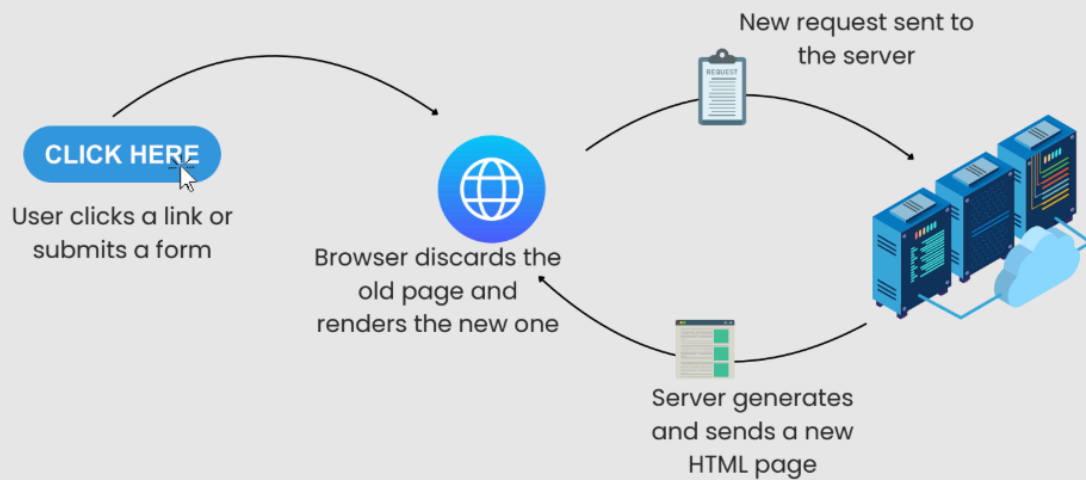
### ? How MPAs work?

- **User** link එකක් click කලාම **server** එකට අලුත් **request** එකක් යනවා.
- **Server** එක පූර්ණ **HTML** පිටුවක් යවනවා.
- **Browser** එක parana page එක **discard** කරලා අලුත් එක render කරනවා.

# Initial Load



# User Interaction



- SEO friendly (search engines වලට හොඳයි)
- සරල Architecture එකක් (specially Server-Side Rendering වලදී)
- Traditional forms & full-page navigation වලට සුදුසුයි

## ❌ අවාසි

- **Slow UX:** හැම click එකකටම full-page reload එකක් වෙයි
- Layouts & static files නැවත නැවත load කරනවා
- Real-time app වලට හොඳ option එකක් නවෙයි

## 🔧 Typical Tech Stack:

- **Server-side frameworks:** Django, Laravel, Ruby on Rails, Spring MVC
- **Templating Engines:** Jinja2, Blade, Thymeleaf

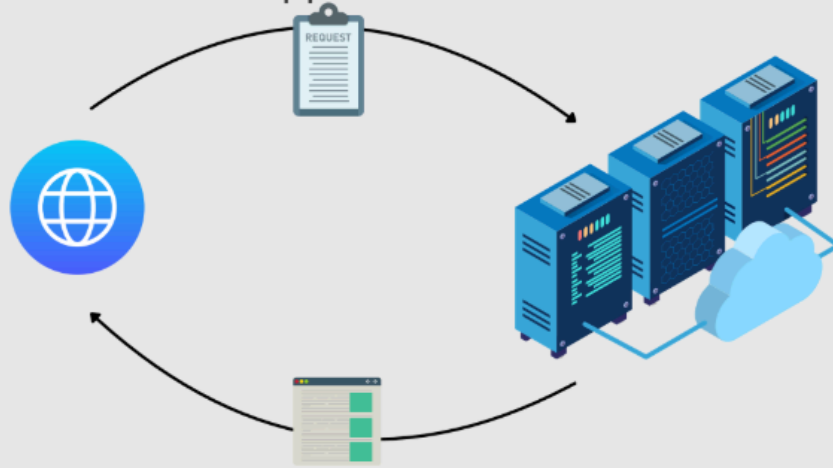
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## 🔄 SPA (Single Page Application)

In an SPA, the initial page load fetches an application "shell" (HTML+JS), and then JavaScript takes over to dynamically update the content without reloading the page.

# Initial Load

Browser requests the  
app URL

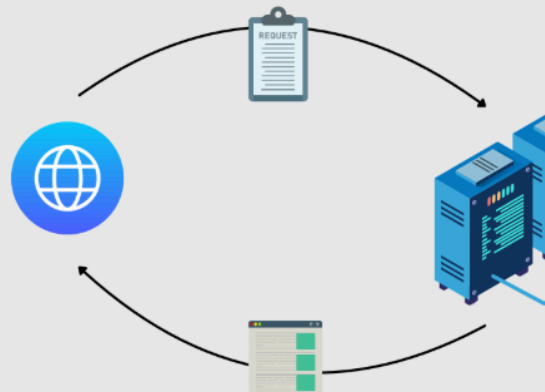


Server responds with minimal  
HTML + JavaScript bundles

# App Initialization



JavaScript runs  
and sets up  
routing, rendering,  
and state



? කොහොමද වැඩ කරන එක?

- පළවැනි load එකේදී **HTML shell** එක + **JavaScript bundles** එකට browser එකට එනවා
- ඒ වීට browser එකම app එක **render** කරනවා
- User interact කළාම, page එක **reload** නොවෙයි, instead DOM එක dynamic update වෙනවා
- Server එකට data-fetching/rest API calls යවනවා

#### ✓ වාසි

- Reloads නැති **smooth user experience** එකක්
- Rich dynamic UI (like mobile apps)
- Efficient: Only data fetch කරනවා, not full page

#### ✗ අවාසි

- Initial load එක **heavy** වනේන සුළුවන
- SEO **tricky** (SSR/pre-rendering අවශ්‍ය වේ)

#### 🔧 Typical Tech Stack:

- **JavaScript Frameworks:** React, Angular, Vue.js
- **Routing:** React Router, Vue Router
- **API:** REST / GraphQL
- **State Management:** Redux, Pinia, Vuex
- **Data Format:** JSON

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## ⚖️ MPA vs SPA - සංකීර්ණ වශයෙන්

Feature	MPA	SPA
Reload	Every action causes page reload	Only content updates, no reload
Performance	Slower (more server work)	Faster (less server dependency)
SEO	Better	Requires SSR/Pre-rendering
Architecture	Server-rendered	Client-rendered (JS-heavy)
Use Case	Blogs, E-commerce, Corporate sites	Dashboards, Social Media, Admin apps