



Web Programming

Spring 2021



#16

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Topics

- The concepts of Web Services
- Web data protocols
 - HTTP, WebSocket, WebRTC
 - HTML, CSS
- Web JavaScript programming
- Cookies and sessions
- **Web Frontend frameworks**
- Web Backend frameworks
- RESTful API design



Web frameworks

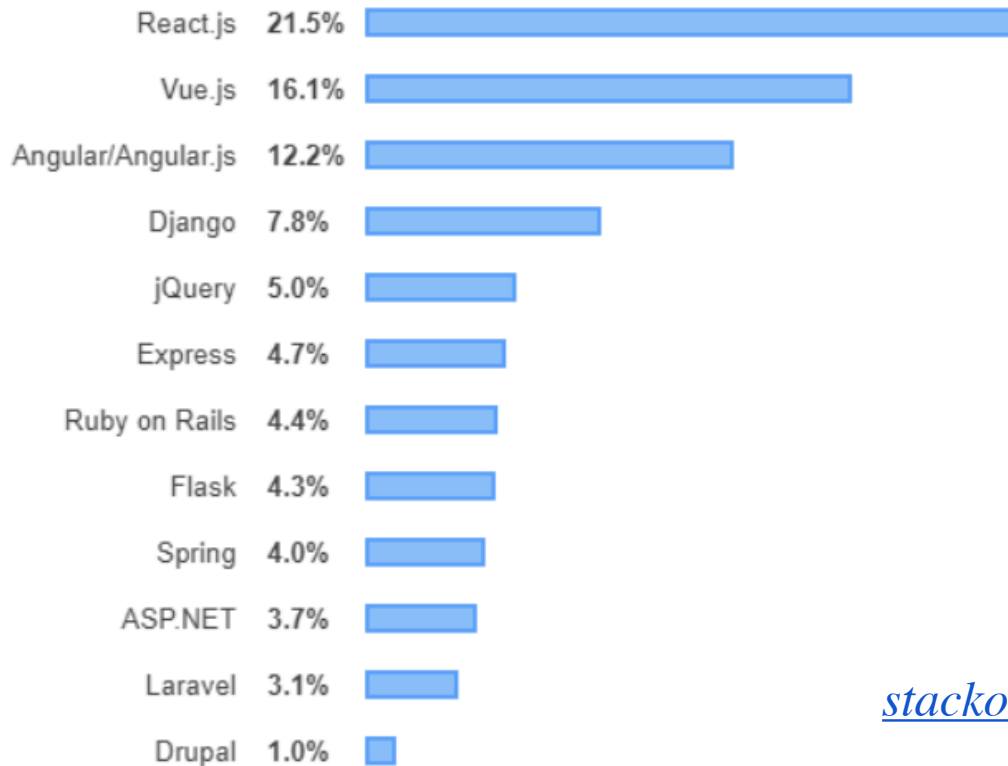
- is designed to support the development of web applications
- 網頁的功能越來越多、網頁的架構也越來越大
- 框架整合了 html、js和css的格式
- 「框架」規範出了規則與模式，來讓開發者打造並部署應用程式
 - 依照它所規定的應用程式的架構範本來打造應用程式
 - 普遍性的功能
 - 標準的方法

Web frameworks 大概分類

- Server-side
 - General-purpose
 - 包含前後端, 主要用 MVC 模式來寫服務
- Client-side
 - single-page applications
 - 主打UI呈現
 - 後端框架提供API

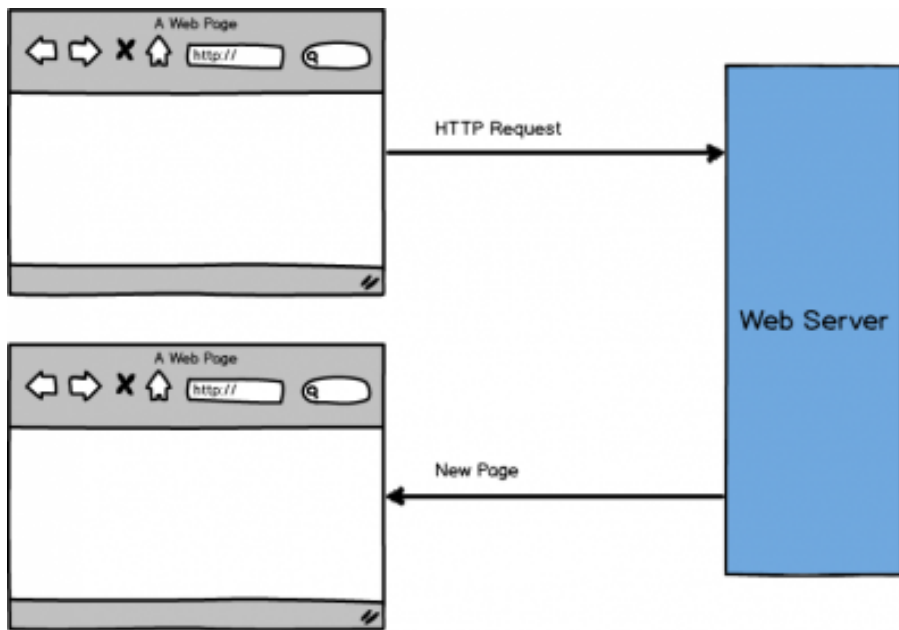


Top Web frameworks



stackoverflow.com 2020

Dynamically generated pages



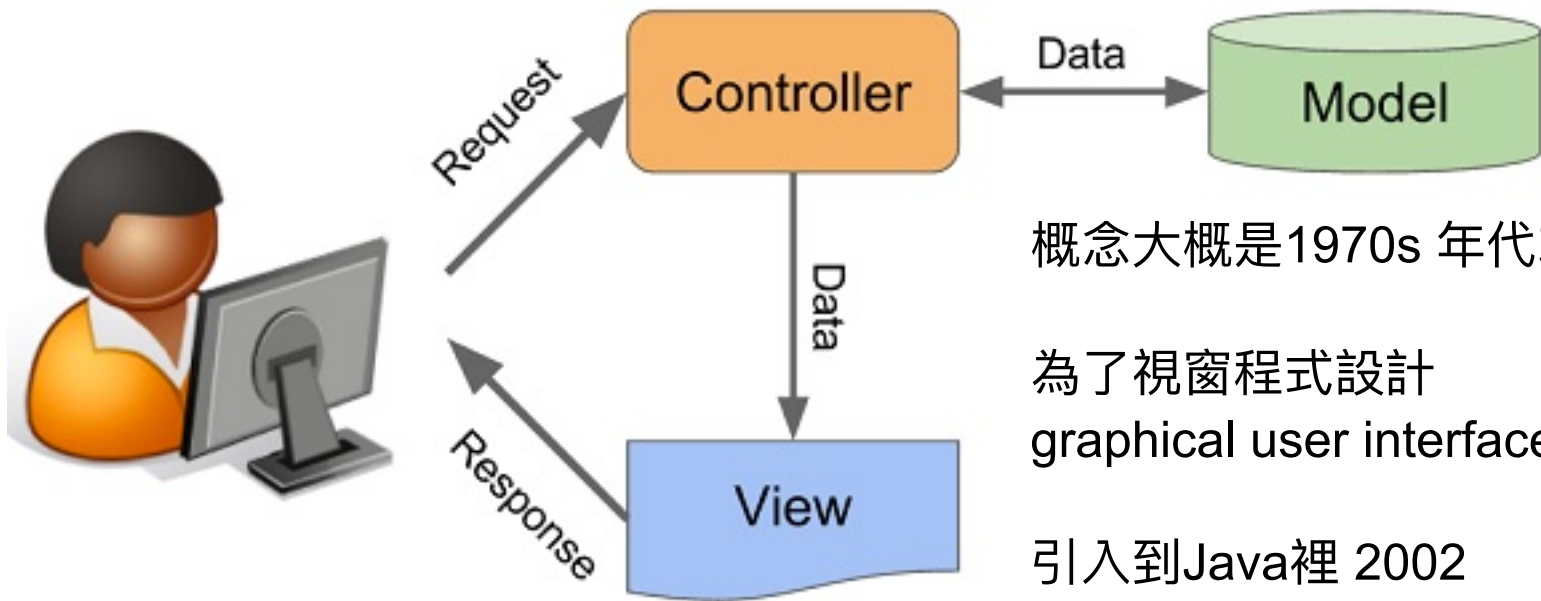
Traditional Full-Page Postback Operation

網頁全部都由 Server-side 產生

最早叫 Common Gateway Interface (CGI), 1993

流行用 C 或是 Perl 寫的
因為非常複雜也煩麻
PHP, ASP, JSP 就開始出現

Model, View, Controller (MVC)



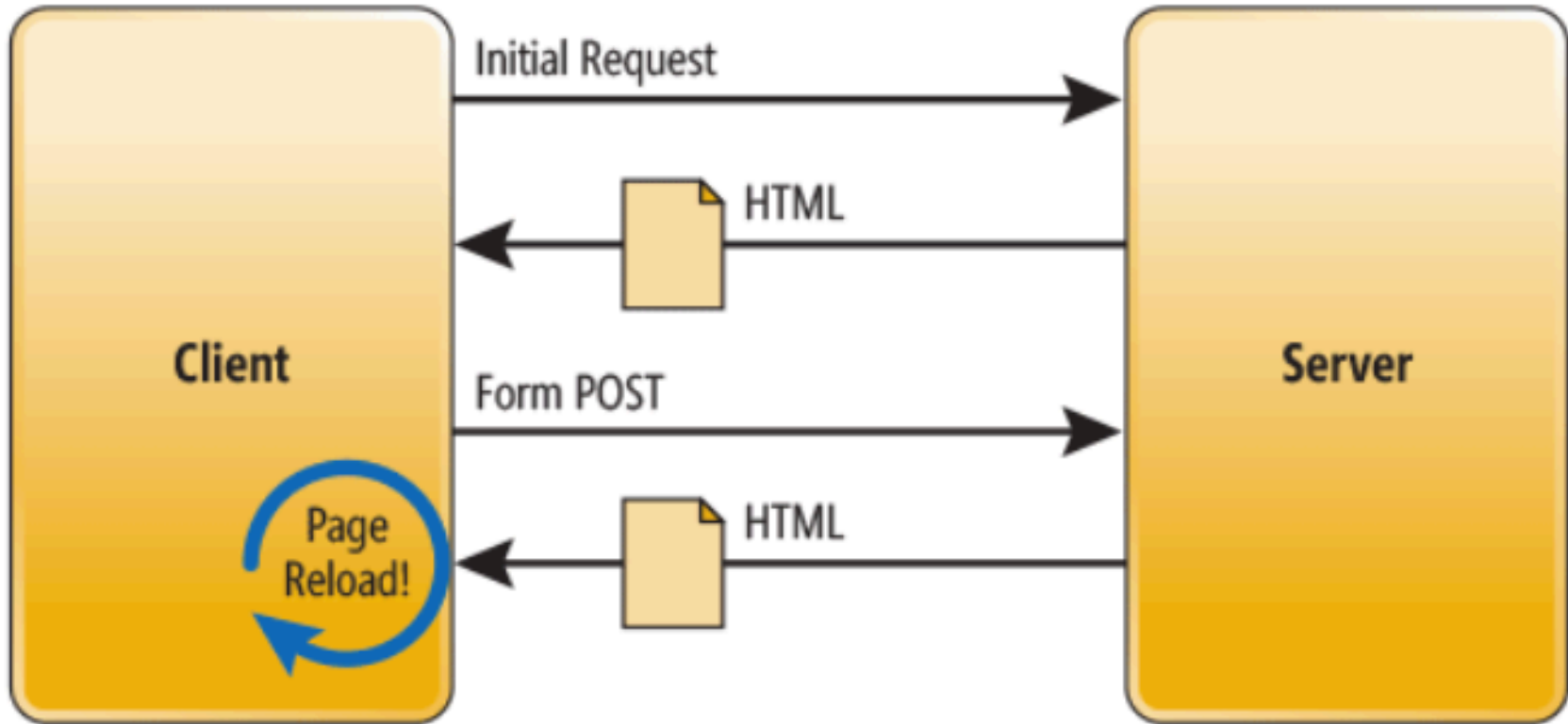
概念大概是1970s 年代左右

為了視窗程式設計
graphical user interfaces (GUI)

引入到Java裡 2002

最後網頁程式也引入 2005

Traditional Page Lifecycle



<https://csie.cgu.edu.tw/p/404-1086-75589.php>



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成員簡介

傑出表現

教學與研究

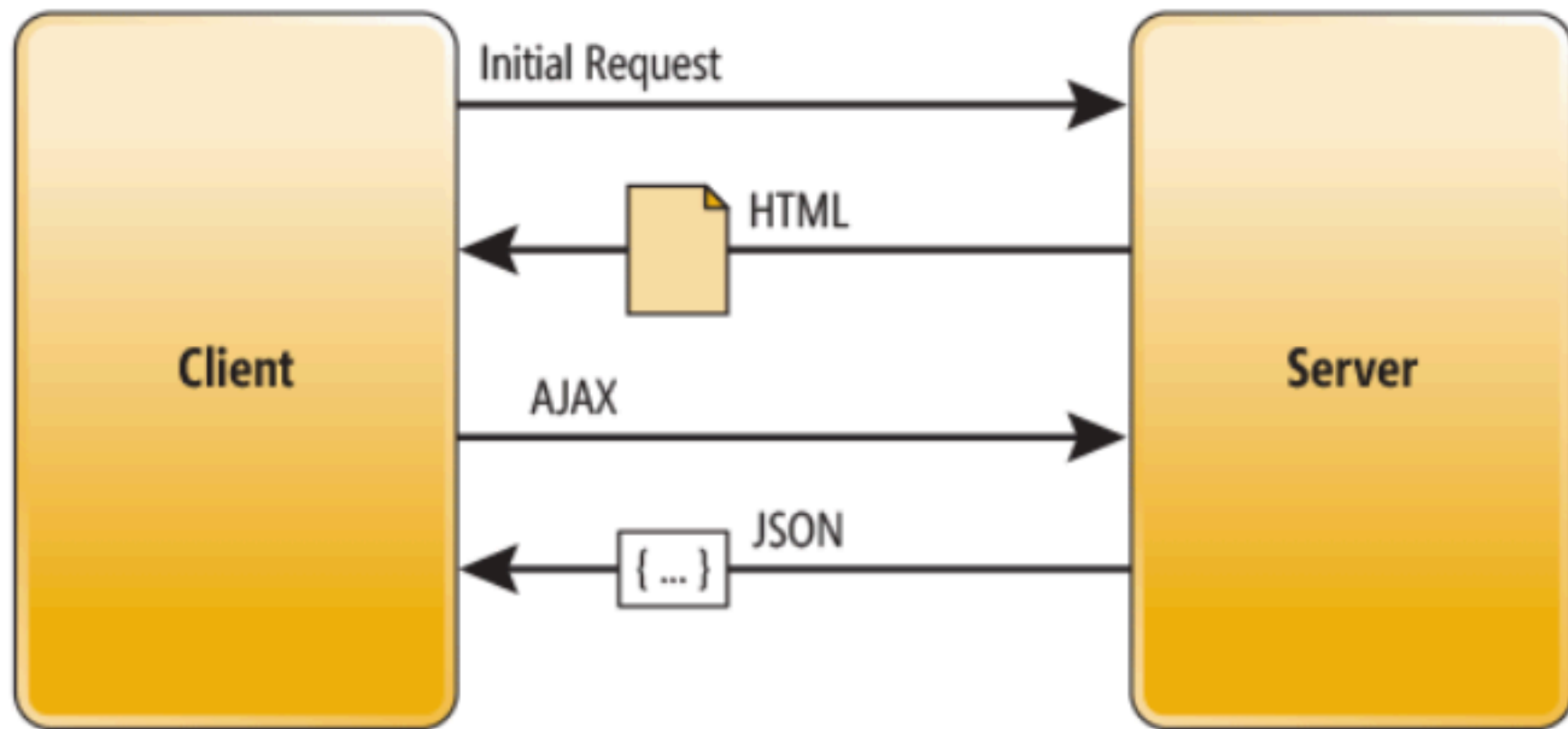
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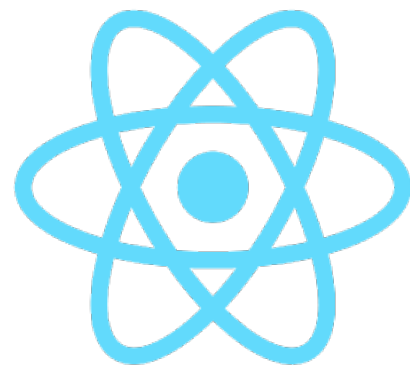
Single-Page Application (SPA)

- JavaScript框架
 - 動態重寫當前頁面來與使用者互動
 - 使網頁瀏覽器停留在單個頁面，並同時支援應用程式與伺服器通信
 - 避免了頁面之間切換打斷使用者體驗，使應用程式更像一個桌面應用程式

SPA Lifecycle



Top 3 Web UI Frontend frameworks 2021



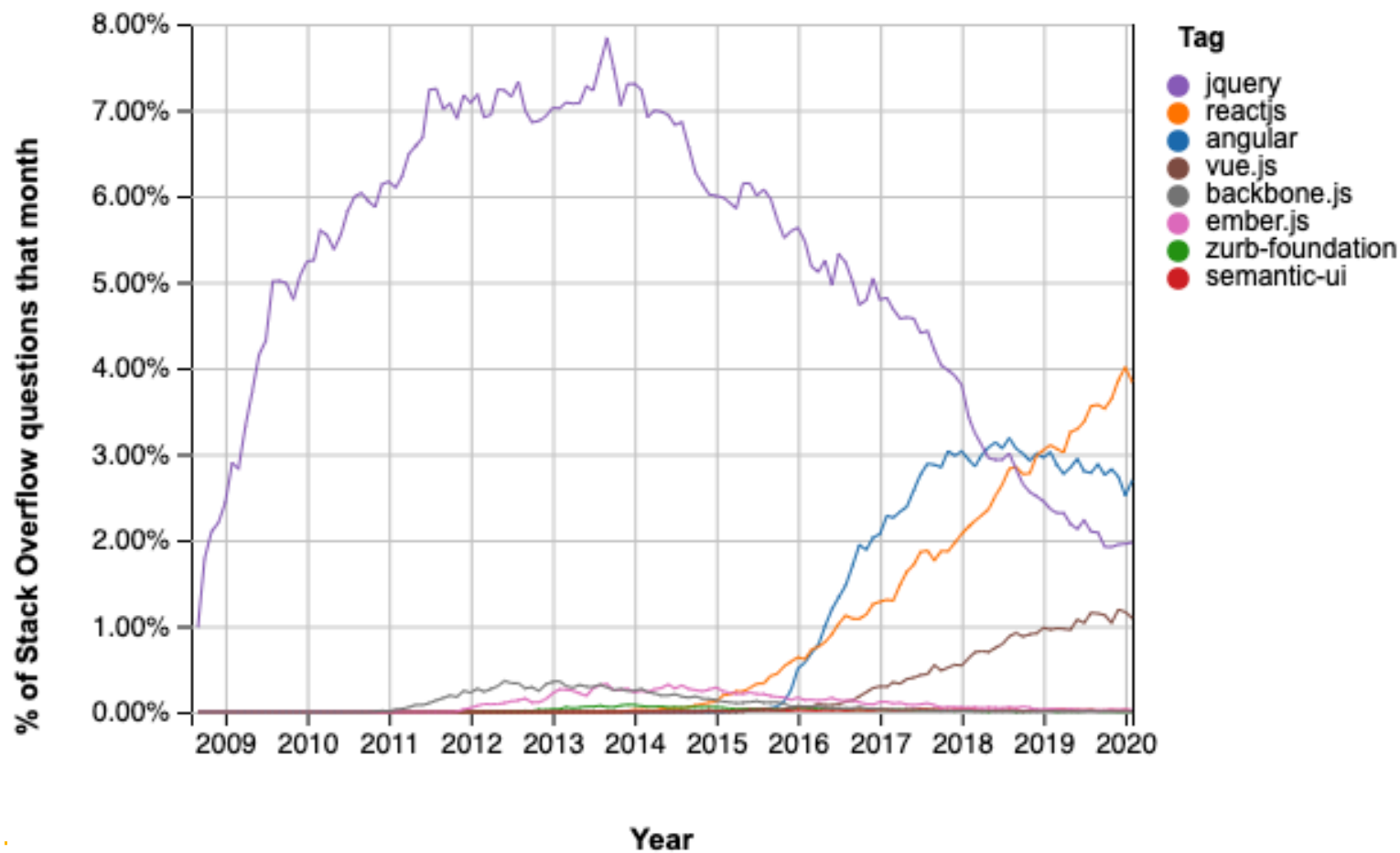
React



Vue.js



ANGULAR





★ 53k

Made with
jQuery

Uber

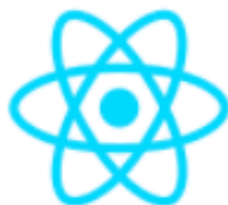


Advantages

- DOM is flexible for adding or removing the elements
- Sending HTTP requests is simplified
- Facilitates dynamic content
- HTTP requests are simplified

Disadvantages

- Comparatively slow working capability
- Many advanced alternatives are available other than jQuery
- The APIs of document object model are obsolete



React



145k

Made with
React



Advantages

- Reusability of components
- Consistent and seamless performance
- React hooks allows to write components without classes and hence, easy to learn
- React dev tools are advanced and super useful

Disadvantages

- Multiple and constant updates
- Complexities of JSX are hard to learn while beginning with the framework
- It only gives frontend solutions



Vue.js



★ 158k

Made with
Vue.js



Advantages

- Extensive and detailed documentation
- Simple syntax - programmers with javascript background can easily get started with Vue.js
- Flexibility to design the app structure
- Typescript support

Disadvantages

- Lack of stability in components
- Relatively small community
- Language barrier with plugins and components



★ 58.4k

Made with
Angular



Forbes



Advantages

- In-built two-way data binding
- Less coding
- decoupling of components
- Usage of dependancy injection and hence, more reusable components
- Vast community for learning and support

Disadvantages

- Steeper learning curve
- Code structure and size are complex in large-scale apps.

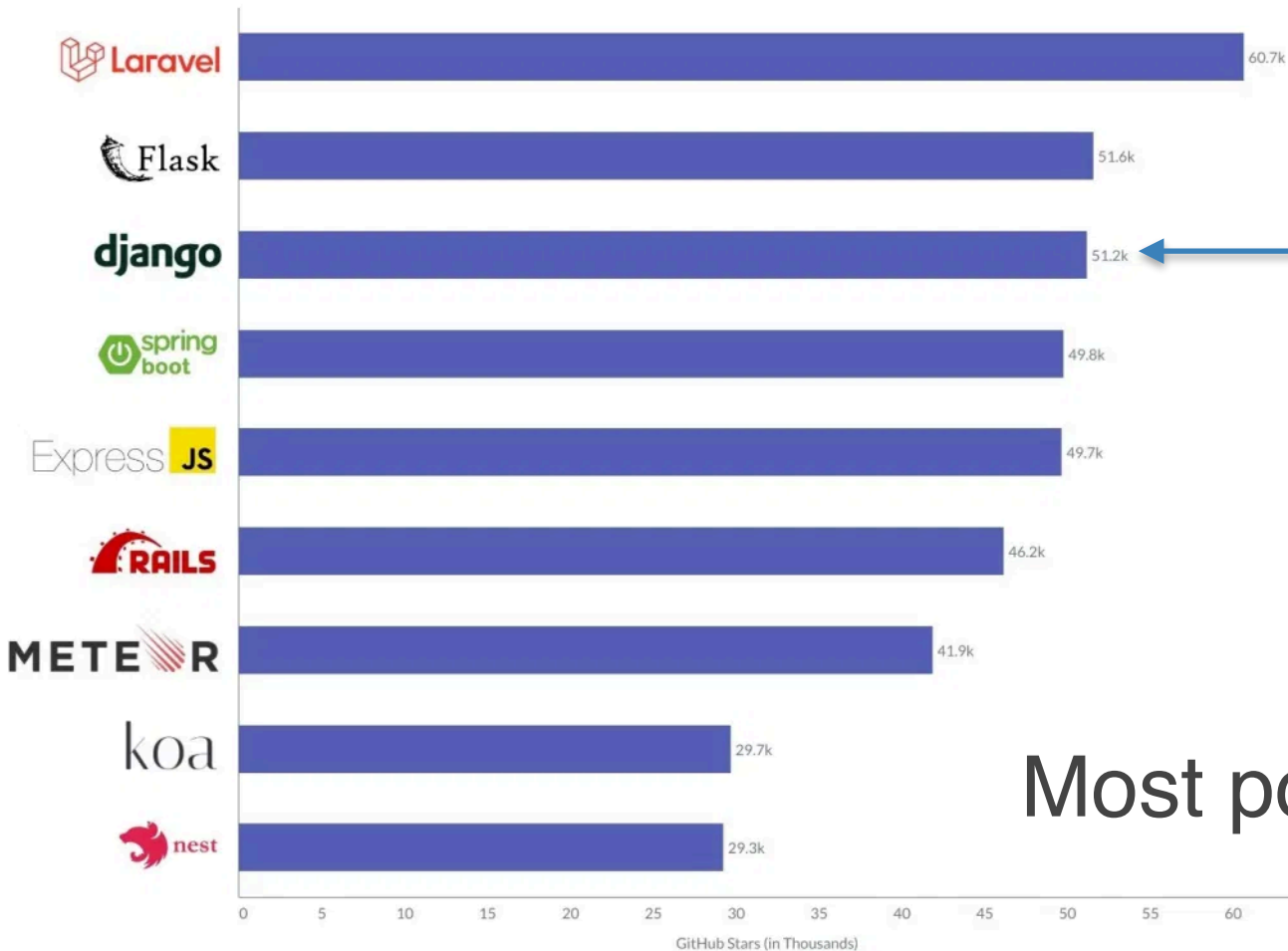
我們之後的架構

django

+



React



Django 低家

Most popular in 2020

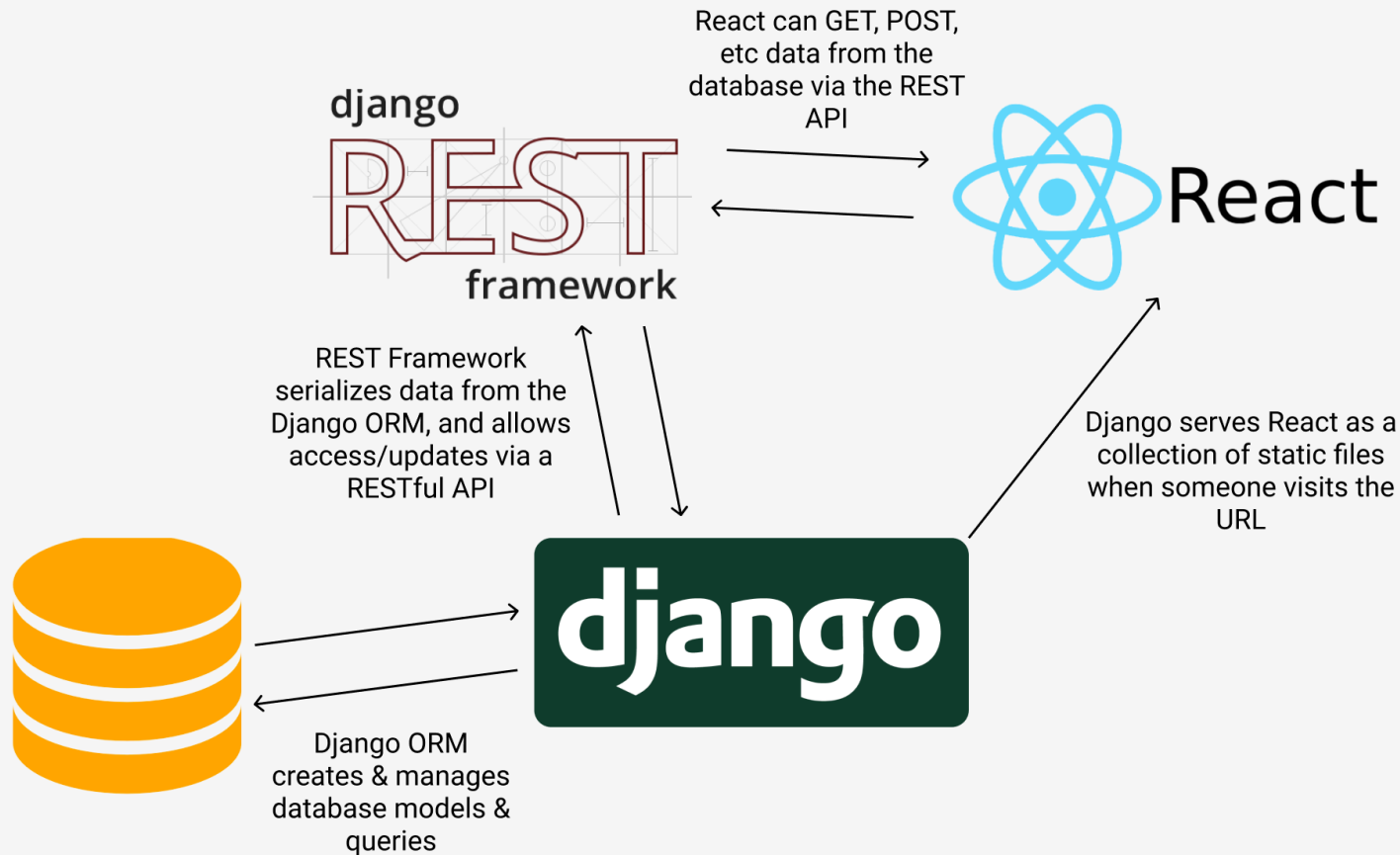
Top 3



django



會一個 其他是差不多的





Response from restful api

data.taipei/opendata/datalist/apiAccess

```
"result": {▼
  "limit": 1000,
  "offset": 0,
  "count": 750,
  "sort": "",
  "results": [▼
    {▶ 47 properties, 2 KB "A_Behavior": "1.獨居的動物，除了交配季節或雌性的育幼時期，牠們都是獨自居住的。 2.最活躍的時間在早晨和晚上。",
      {▶ 47 properties, 1 KB "A_Behavior": "1.國王企鵝在圈養環境下平均壽命約15-20年。 2.國王企鵝繁殖期會群聚在一起，繁殖期期間會發出咆哮聲。",
        {▼
          "A_Behavior": "1.群居。好奇、膽小又謹慎。
            2.吵架或繁殖配對時會發出咆哮聲音非常吵鬧。
            3.屬溫帶氣候企鵝，散熱有撇步：身上薄羽、蓬鬆羽、薄皮下脂；陸上活動時，會找遮蔽地，盡量夜間活動，有張口喘氣散熱習慣。
            4.黑腳企鵝整年都可繁殖，通常在岩石下、植叢內或洞穴內築巢，巢會內襯一些材料。一窩下2個蛋，有下第二窩的記錄。孵化期約38天。",
          "A_Distribution": "南非及納米比亞。",
```

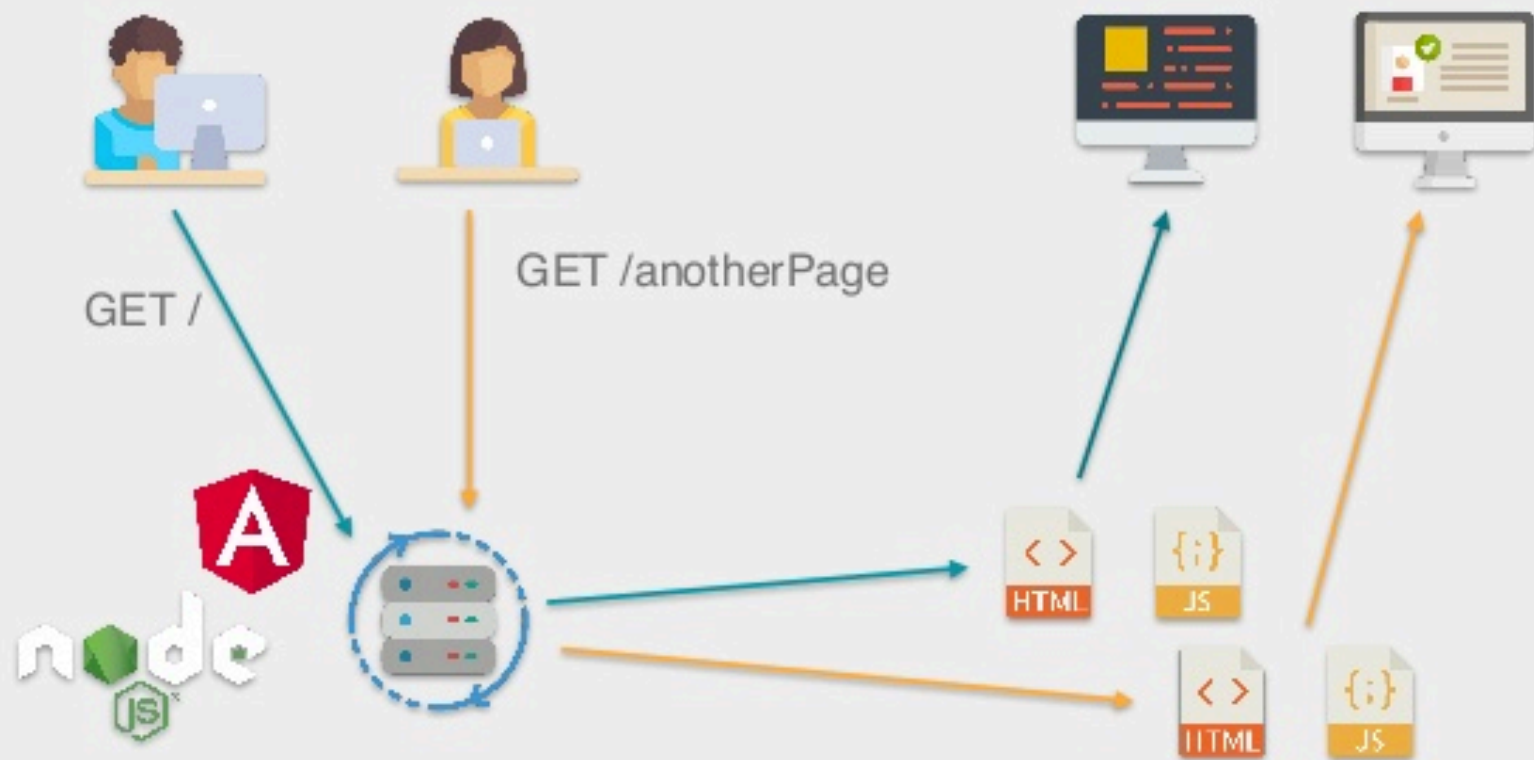
(專案倒數1天)
你需要的API我都做完了唷！加油！



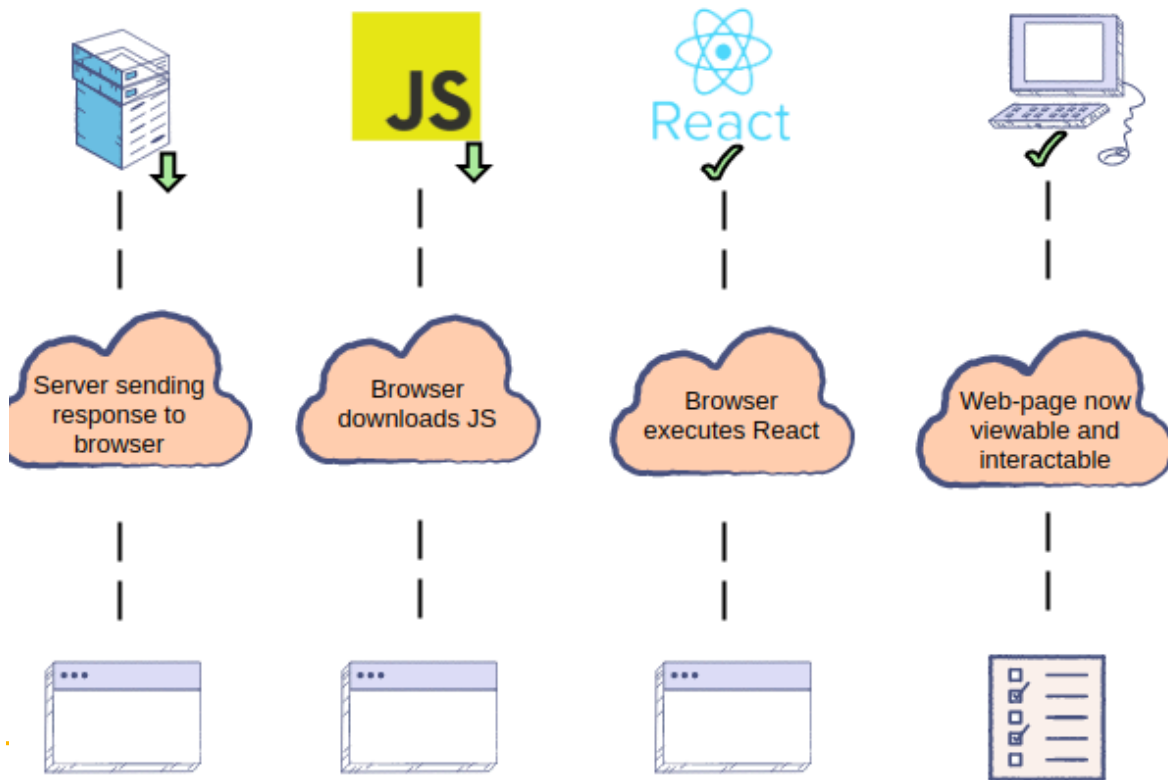
前端

後端

Server Side Rendering



Client-side rendering



Conclusion

- Server-side
 - 包含前後端, 主要用 MVC 模式來寫服務
- Client-side
 - single-page applications
 - 後端框架提供API
- 各大網頁框架介紹



Thanks!

Open for any questions

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