# Chapter 4

Building an E-Commerce Presence:

Websites, Mobile Sites, and Apps

# Learning Objectives

1. Understand the steps you should take, in developing an e-commerce presence.

   知道開發電子商務平臺的步驟

2. Identify and understand the major considerations involved in choosing web server and e-commerce merchant server software.

   了解和理解在選擇網絡服務器和電子商務服務器軟件時主要考慮的問題

3. Understand the important considerations involved in developing a mobile website and building mobile applications.

   知道在開發移動端網站和移動應用時需要考慮的問題

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# Part I:

# Some Key Points in the Development of E-commerce Presence

# Some Key Points in the Development of E-commerce Presence

電子商務平臺開發中的一些關鍵點

- **What's the idea?**

Before you can plan and actually build an e-commerce presence, you need to have a vision of what you hope to accomplish and how you hope to accomplish it. The vision includes:

  - Mission statement
  - Target audience
  - Intended market space
  - Strategic analysis
  - Marketing matrix
  - Development timeline
  - Preliminary budget

# Some Key Points in the Development of E-commerce Presence

- **Where's money: Business and revenue model**

  資金來源：商業模式和盈利模式

  - Basic business models include portal, e-tailer, content provider, transaction broker, market creator, service provider, and community provider (social network).

    基本的商業模式包括門戶網站、電子零售商、內容提供商、交易經紀人、市場創造者、服務提供商和社區提供商（社交網絡）.

  - Basic revenue model alternatives are advertising, subscriptions, transaction fees, sales, and affiliate revenue.

    基本盈利模式：廣告盈利模式、訂閱盈利模式、交易傭金盈利模式、銷售盈利模式和會員制盈利模式.

# Some Key Points in the Development of E-commerce Presence

- **Who and where is the target audience?**

  目標受衆是誰? 在哪?

  – There are two questions here: Who is your target audience, and where can you best reach them? Target audience can be described in many ways: demographics, behavior patterns (lifestyle), current consumption patterns (online vs. offline purchasing), digital usage patterns, and content creation preferences (blogs, social networks).

    這裏有兩個問題需要回答: 誰是你的目標受衆?你在哪裏最容易接觸到他們? 可以通過多種方式描述目標受衆: 人口統計、行爲模式（生活方式）、當前消費模式（綫上還是綫下購買）、數字設備使用模式、和內容創建方式的偏好（博客、社交網絡）.

# Some Key Points in the Development of E-commerce Presence

- **What is the ballpark?**

  目標市場是什麼?

  – What are the features of the marketplace you are about to enter? Is the market growing, or receding in size? If it's growing, among which age and income groups? Is there a special role for a mobile presence in this market? What percentage of your target audience uses a website, smartphone, or tablet?

    您即將進入的市場有哪些特點？市場是在增長還是萎縮？ 如果它在增長，消費者年齡分布和收入分布如何？ 移動設備在這個市場中是否有特殊作用？ 您的目標受衆中使用網站、智能手機或平板電腦的人數占多少？

# Some Key Points in the Development of E-commerce Presence

- **Where's the content coming from?**

  內容從哪裏獲得?

  – Websites are composed of a lot of pages that have content ranging from text, to graphics, photos, and videos. This content is what search engines catalog as they crawl through all the new and changed web pages on the Internet. Therefore, the content is the single most important foundation for your revenue and ultimate success.

    網站由許多頁面組成，內容包括：文本、圖形、照片和視頻. 網站內容是搜索引擎獲取互聯網上所有新增加賀更改的網頁的依據. 因此，內容是獲得收入和最終成功的最重要的基礎.

# Some Key Points in the Development of E-commerce Presence

- **Where's the content coming from?**

  内容從哪裏獲得?

  - There are generally two kinds of content: static and dynamic. Static content is text and images that do not frequently change, such as product descriptions, photos, or text that you create to share with your visitors. Dynamic content is content that changes regularly, say, daily or hourly. Dynamic content can be created by you or, increasingly, by users. User-generated content has a number of advantages: It's free, it engages your customer fan base, and search engines are more likely to catalog your site if the content is changing. Other sources of content, especially photos, are external websites that aggregate content.

    通常有兩種內容: 靜態的和動態的. 靜態內容是不經常更改的文本和圖像，例如產品說明、照片. 動態內容是指定期變化，如每天或每小時更改的內容. 動態內容可以由你創建，也可以由其他用戶創建. 用戶生成內容具有許多優點: 它是免費的，可以吸引你的客戶群，並且對內容進行更改時，搜索引擎更有可能對你的網站進行優先推薦. 其他內容來源，尤其是照片，來自匯總內容的外部網站.

# Some Key Points in the Development of E-commerce Presence

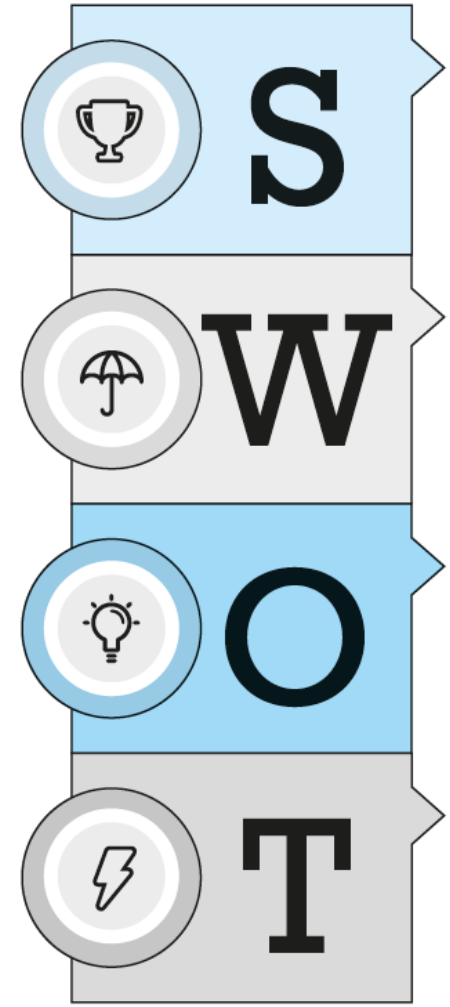
- **SWOT Analysis** 强弱危機分析、優劣分析法、SWOT分析法

**SWOT analysis** is a simple but powerful method for strategizing about your business and understanding where you should focus your efforts. In a SWOT analysis you describe your strengths, weaknesses, threats, and opportunities.

SWOT分析是一種簡單但强大的方法，可用於制定業務戰略並了解應該將精力集中在哪些方面. 在SWOT分析中，描述了你自己的優勢、劣勢、威脅和機會.

| | Helpful 對達成目標有幫助的 to achieving the objective | Harmful 對達成目標有害的 to achieving the objective |
|---|---|---|
| Internal 內部(組織) attributes of the organization | Strengths:優勢 | Weaknesses:劣勢 |
| | | |
| External 外部(環境) attributes of the environment | Opportunities:機會 | Threats:威脅 |
| | | |

# Some Key Points in the Development of E-commerce Presence




**STRENGTHS**

Current sites do not address market needs • Unique approach • Easy navigation • Better personalization • Customer base growing • High-value market segment • Superior social strategy

**WEAKNESSES**

Limited financial resources • No prior online experience • No existing user base • No media attention • No Web design expertise • No computer background

**OPPORTUNITIES**

Ability to address large market with unmet needs • Potential to capture significant share of this market • Potential to develop related sites

**THREATS**

Approach could be copied by competitors • Advertisers may not want to try a new site • Rapid pace of technological development • Low market entry costs

A SWOT analysis describes your firm's strengths, weaknesses, opportunities, and threats

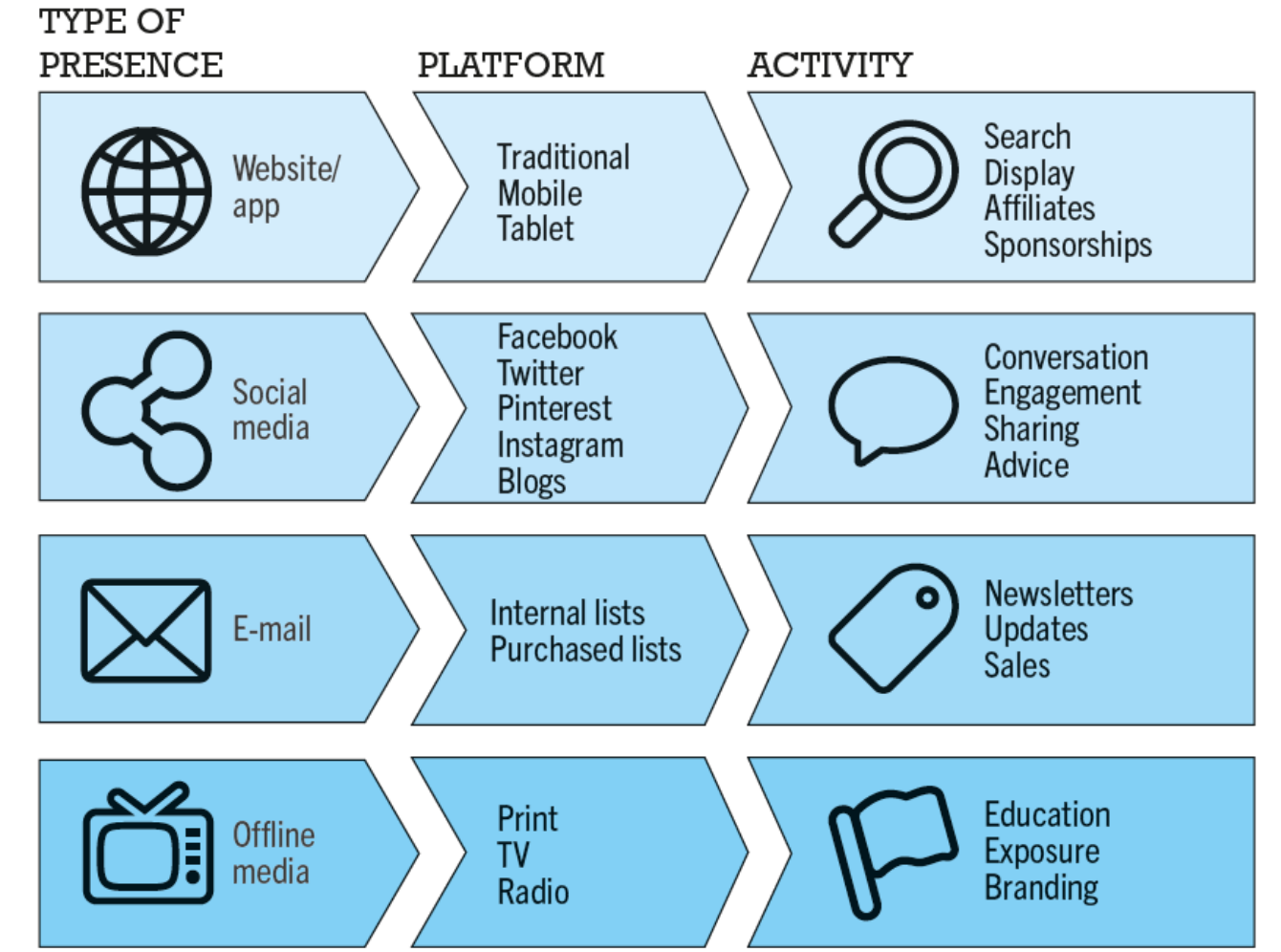
# Some Key Points in the Development of E-commerce Presence

- **Develop an E-commerce Presence Map**

➢ Some different kinds of e-commerce presence: website/app, social media, e-mail, and offline media. For each of these types there are different platforms that you will need to address. For instance, in the case of websites and/or apps, there are three different platforms: traditional desktop/laptops, smartphones, and tablets, each with different capabilities. And for each type of e-commerce presence, there are related activities you will need to consider. For instance, in the case of websites and apps, you will want to engage in search engine marketing, display ads, affiliate programs, and sponsorships. Offline media, the fourth type of e-commerce presence, is included here because many firms use multiplatform or integrated marketing in which print, television, and/or radio ads refer customers to websites and apps.

一些不同的電子商務平臺: 網站/APP、社交媒體、電子郵件和綫下媒體. 對於每種類型，你都需要開發不同的平臺. 例如，對於網站/APP，有三個不同的平臺，即傳統桌面、智能手機和平板電腦，每個平臺具有不同的功能. 對於每種類型的電子商務平臺，你需要考慮相關的活動. 例如，對於網站/APP，你將要從事搜索引擎營銷、展示廣告、網絡會員制營銷和贊助. 綫下媒體是第四類電子商務平臺，因爲許多公司使用多平臺或集成營銷，其中傳單、電視廣告或廣播廣告將客戶吸引到網站和APP上.

# Some Key Points in the Development of E-commerce Presence




An e-commerce presence requires firms to consider the four different kinds of presence and the platforms and activities associated with each type of presence.

# Some Key Points in the Development of E-commerce Presence

- **Develop a timeline** 設立時間軸

## E-commerce Presence Timeline

| PHASE | ACTIVITY | RESULT |
|---|---|---|
| **Phase 1: Planning** | Envision e-commerce presence; determine personnel | Mission statement |
| **Phase 2: Website development** | Acquire content; develop a site design; arrange for hosting the site | Website plan |
| **Phase 3: Web implementation** | Develop keywords; focus on search engine optimization; identify potential sponsors | A functional website |
| **Phase 4: Social media plan** | Identify appropriate social platforms and content for your products and services | A social media plan |
| **Phase 5: Social media implementation** | Develop Weibo, Facebook presence | Functioning social media presence |
| **Phase 6: Mobile plan** | Develop a mobile plan; consider options for porting your website to smartphones | A mobile media plan |

The World Wide Web (WWW), commonly known as the Web.

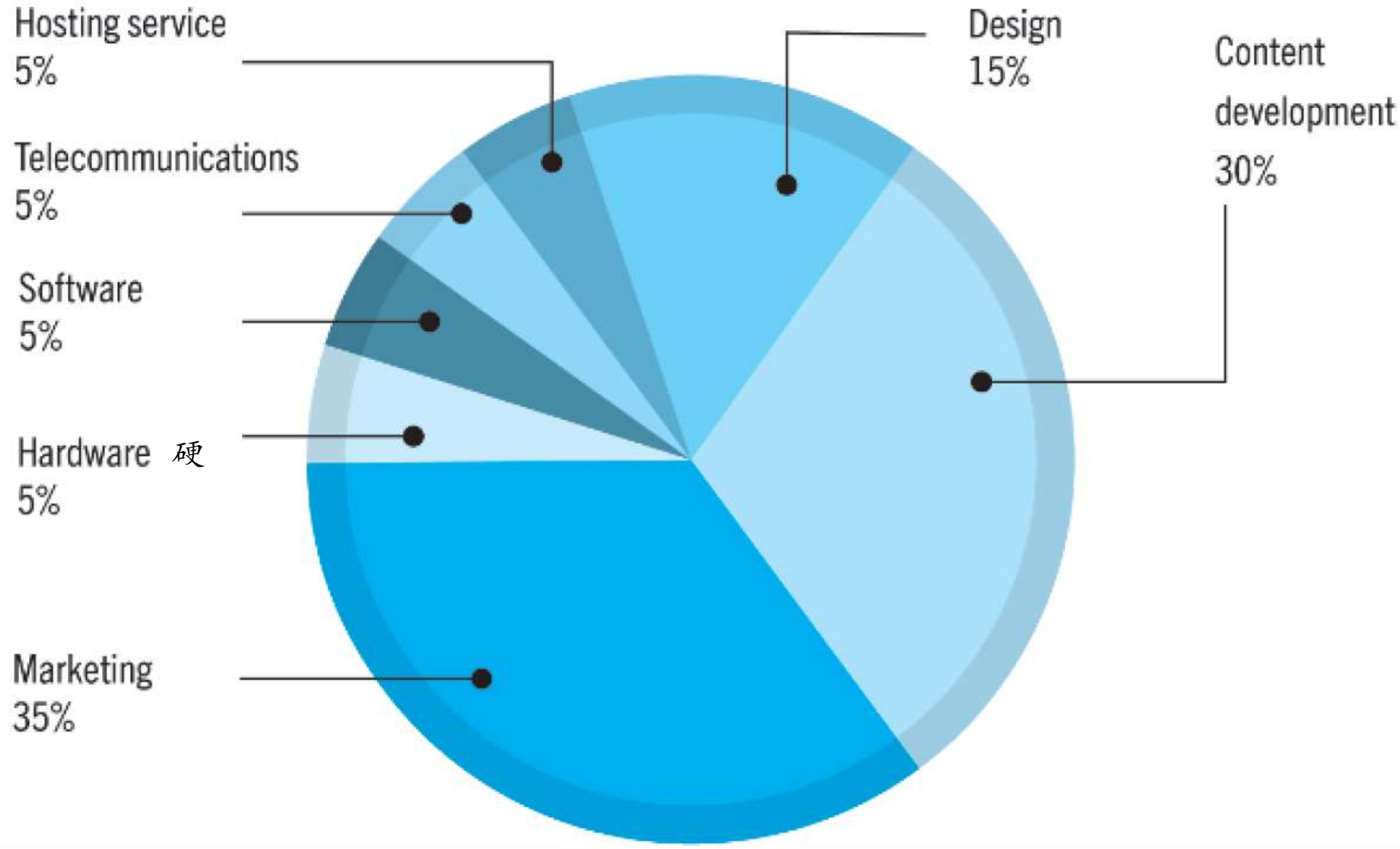
# Some Key Points in the Development of E-commerce Presence

- **How much will this cost on a website?**
  - Build a simple website with a first-year cost: $5,000 or less, if all the work is done in-house by yourself and others willing to work without pay.

    建立簡單的網站: 首期費用不會超過5000美元，前提是所有工作都有你自己或其他零薪酬自願者完成.
  - A small startup using available tools and design services such as WordPress : $10,000 to $25,000.

    使用可用工具和設計服務（如 WordPress）的小型初創公司：10,000 至 25,000美元.
  - Large firms: Several hundred thousand to millions of dollars a year to create and operate.

    大型企業：每年數十萬到數百萬美元來開發和運營.




**Components of a Website Budget**

# Part II:

# Building an E-Commerce Website: A Systematic Approach

# Building an E-Commerce Site: A Systematic Approach

## Most important management challenges:

面臨最重要的挑戰:

- Developing a clear understanding of business objectives. It requires you to build a plan for developing your firm's presence.

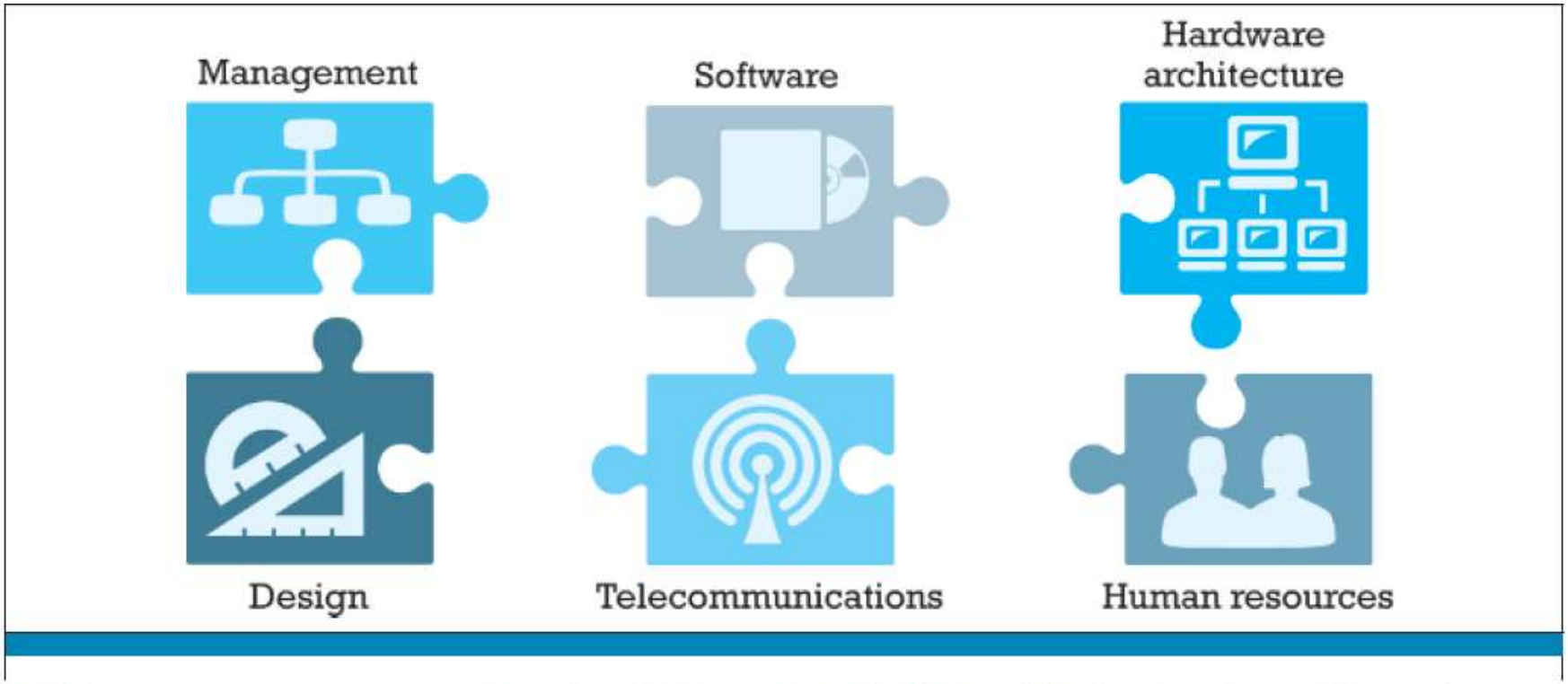
  清晰地描繪出自己的商業目標. 這需要你制定出開發企業網站的詳細計劃.

- Knowing how to choose the right technology to achieve those objectives. It requires you to understand some of the basic elements of e-commerce infrastructure.

  知道如何選擇合適的技術來實現這些目標. 這需要你對電子商務網站基礎設施的組成要素要有所了解.

# Building an E-Commerce Site: A Systematic Approach

**Main areas where you will need to make decisions in developing an e-commerce presence**




Building an e-commerce presence requires that you systematically consider the many factors that go into the process.

# Building an E-Commerce Site: A Systematic Approach

## Main areas where you will need to make decisions in developing an e-commerce presence

On the organizational and human resources fronts, you will have to bring together a team of individuals who possess the skill sets needed to build and manage a successful e-commerce presence. This team will make the key decisions about business objectives and strategy, technology, design, and social and information policies. You will also need to make decisions about hardware, software, and telecommunications infrastructure. The demands of your customers should drive your choices of technology. Your customers will want technology that enables them to easily find what they want, view the product, purchase the product, and then receive the product from your warehouses quickly. You will also have to carefully consider design. Once you have identified the key decision areas, you will need to think about a plan for developing the project. There are a number of different methodologies for building information systems such as websites. One of the most traditional methods is the systems development life cycle.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

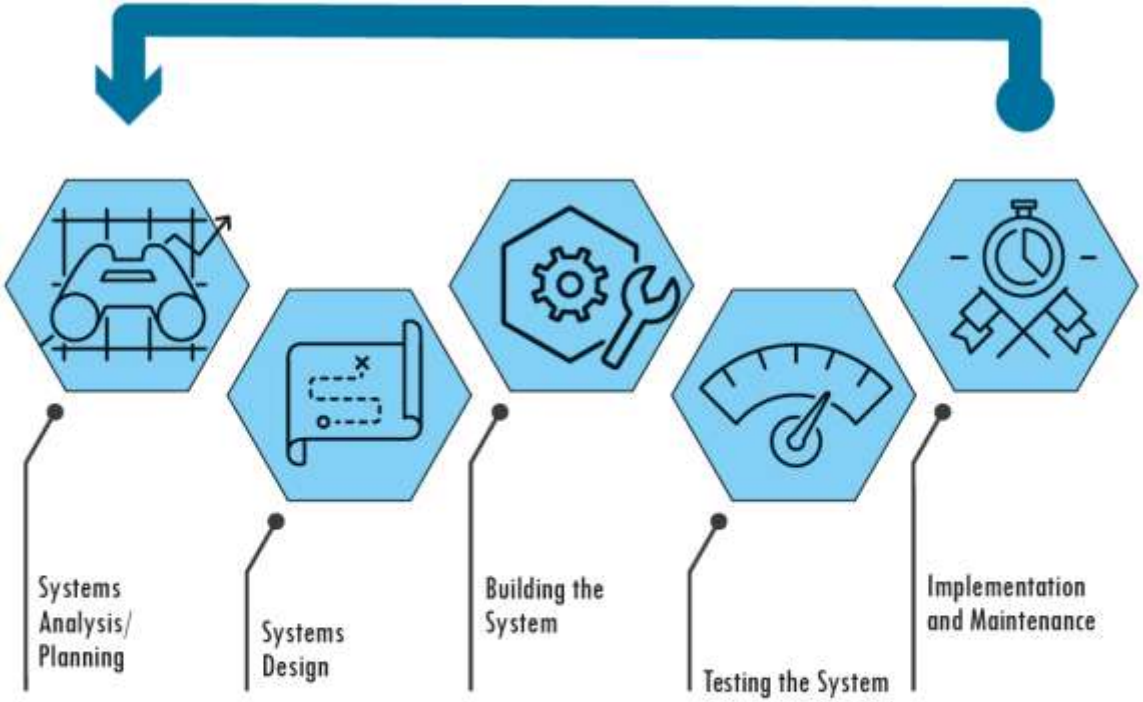
- The systems development life cycle (SDLC) is a methodology for understanding the business objectives of any system and designing an appropriate solution. There are the five major steps involved in the systems development life cycle for building an e-commerce site:

  系統開發生命周期法是一種用於了解系統的商業目標並爲之設計適當解決方案的方法. 建立電子商務網站的系統開發生命周期法涉及五個主要步驟:

  - Systems analysis/planning 系統分析/計劃
  - Systems design 系統設計
  - Building the system 系統開發
  - Testing the system 系統測試
  - Implementation and maintenance 運行和維護

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 1. System Analysis

系統分析

Identify business objectives, system functionality, and information requirements.

確定商業目標、系統功能和信息需求.

- **Business objectives** are capabilities you want your site to have.

  商業目標是指你希望自己的網站應具備的能力.

- **System functionalities** are types of information systems capabilities you will need to achieve your business objectives.

  系統功能指實現商業目標所需的信息系統功能類型.

- **Information requirements** are the information elements that the system must produce in order to achieve the business objectives.

  信息需求指爲實現商業目標,系統必須具備的信息元素.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### System Analysis, Business Objectives, System Functionalities, and Information Requirements for a Typical E-commerce Site

系統分析：典型電子商務站點的商業目標、系統功能和信息需求

| Business Objective | System Functionality | Information Requirements |
|---|---|---|
| Display goods | Digital catalog | Dynamic text and graphics catalog |
| Provide product information | Product database | Product description, stocking numbers, inventory levels |
| Personalize/customize product | Customer on-site tracking | Site log for every customer visit; data mining capability to identify common customer paths and appropriate responses |
| Engage customers in conversations | On-site blog; user forums | Software with blogging and community forum functionality |
| Execute a transaction | Shopping cart/payment system | Secure credit card clearing; multiple payment options |
| Accumulate customer information | Customer database | Name, address, phone, and e-mail for all customers; online customer registration |
| Provide after-sale customer support | Sales database | Customer ID, product, date, payment, shipment date |
| Coordinate marketing/advertising | Ad server, e-mail server, e-mail, campaign manager, ad banner manager | Site behavior log of prospects and customers linked to e-mail and banner ad campaigns |
| Understand marketing effectiveness | Site tracking and reporting system | Number of unique visitors, pages visited, products purchased, identified by marketing campaign |
| Provide production and supplier links | Inventory management system | Product and inventory levels, supplier ID and contact, order quantity data by product |

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 2. Systems Design: Hardware and Software Platforms

系統設計：軟硬件平臺

- System design specification: Description of main components of a system and their relationship to one another

  系統設計說明書: 對系統主要功能模塊以及模塊間相互關係的說明

- Two components of system design:

  系統設計的兩個組成部分:

  - Logical design

    邏輯設計

  - Physical design

    物理設計

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 2. Systems Design: Hardware and Software Platforms

系統設計：軟硬件平臺

- **Logical design** includes a data flow diagram that describes the flow of information at your e-commerce site, the processing functions that must be performed, and the databases that will be used. The logical design also includes a description of the security and emergency backup procedures that will be instituted, and the control procedures that will be used in the system.

  邏輯設計包含描述電子商務網站信息流動的數據流圖、必須執行的處理功能以及采用的數據庫.邏輯設計還包括確定網站使用的安全和緊急備份程序，以及在系統中使用的控制程序.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 2. Systems Design: Hardware and Software Platforms

系統設計：軟硬件平臺

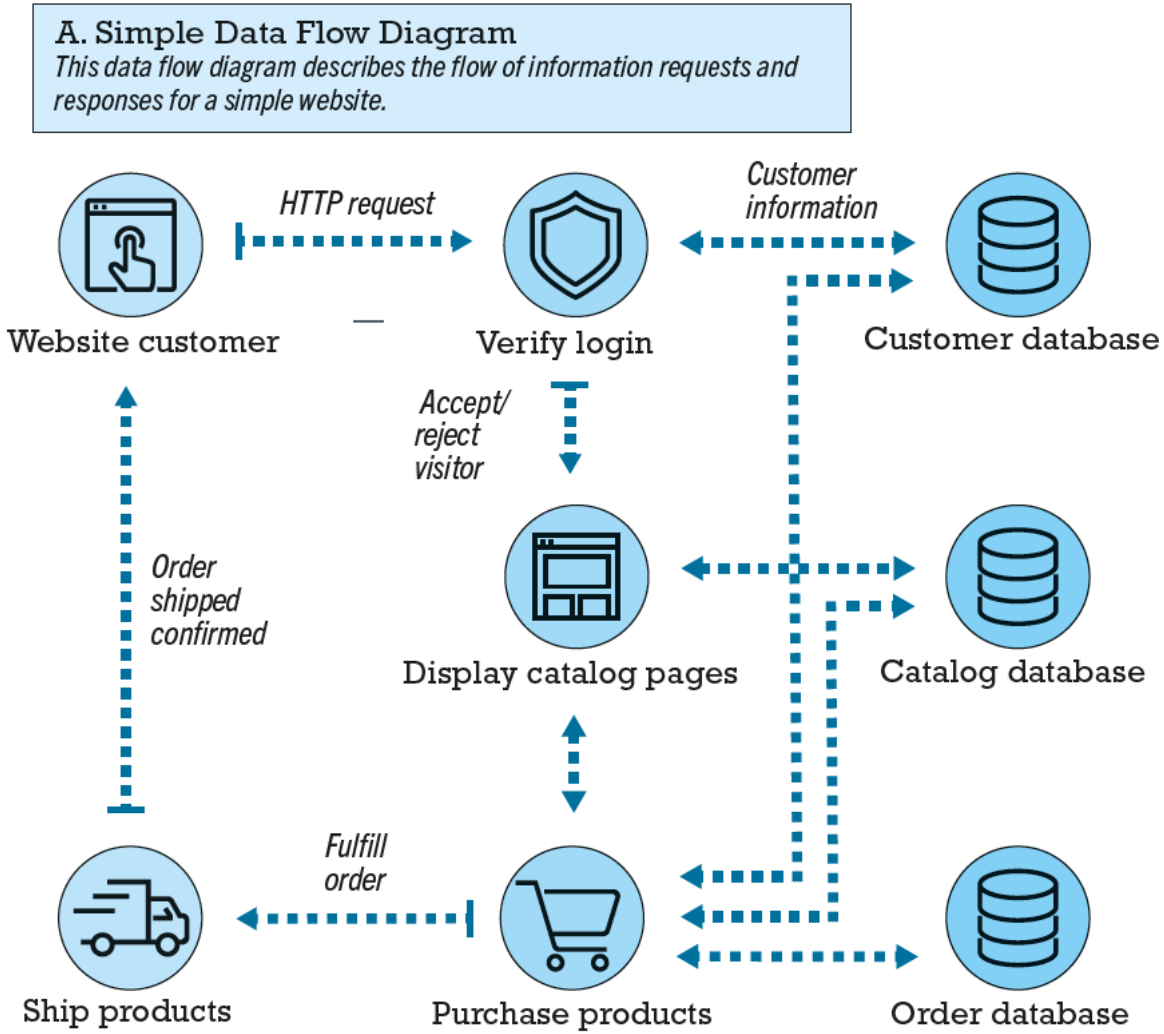
- **Physical design** translates the logical design into physical components. For instance, the physical design details the specific model of server to be purchased, the software to be used, the size of the telecommunications link that will be required, the way the system will be backed up and protected from outsiders, and so on.

  物理設計將邏輯設計轉化爲現實的物理組件. 例如，物理設計要詳細說明要購買的服務器型號、要使用的軟件、所需的通信綫路應具備的容量、系統的備份和保護方式等.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

Data Flow Diagram of the Logical Design of a Website



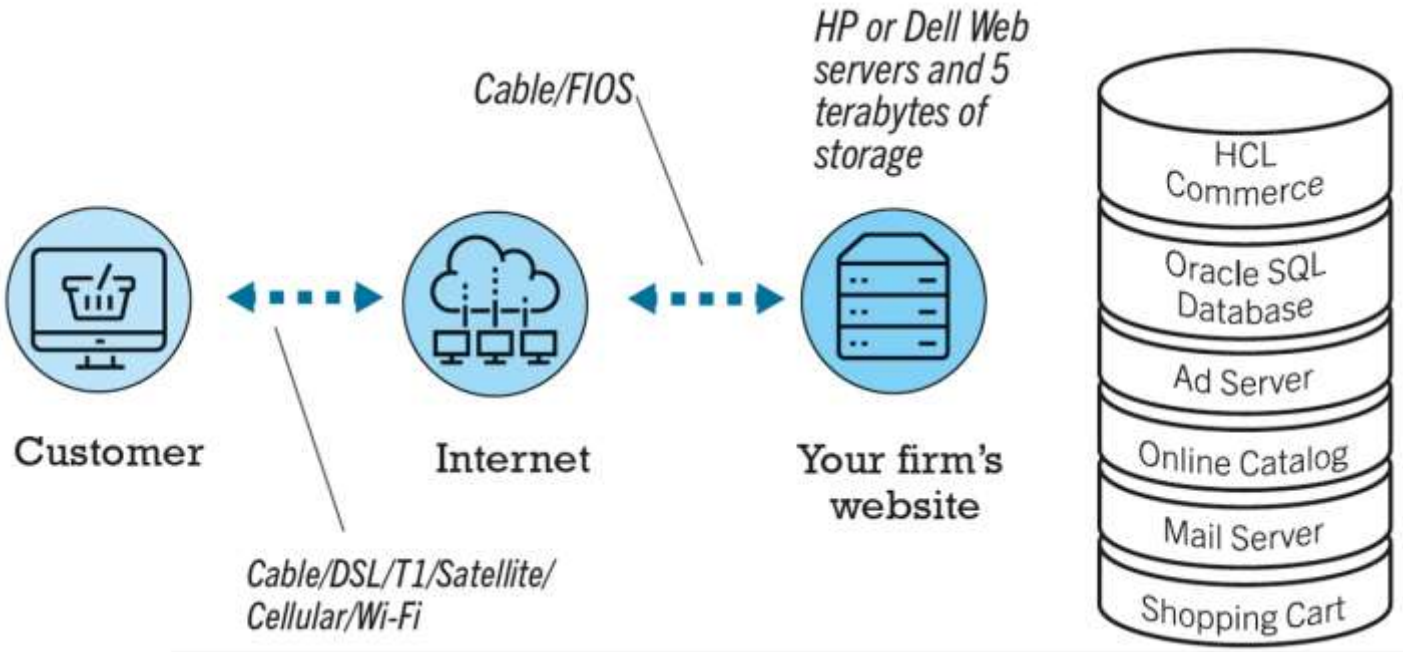
# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

Physical Design for a Website

**B. Simple Physical Design**

*A physical design translates the high-level logical into the physical components, such as the computers, telecommunications links, and software necessary to carry out the logical design.*



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Once you have a clear idea of both the logical and the physical designs for your site, you can begin considering how to actually build the site. You have many choices. Choices range from outsourcing everything (including the actual systems analysis and design) to building everything yourself (in-house). Outsourcing involves hiring an outside vendor to provide the services involved in building the site rather than using in-house personnel. You also have a second decision to make: Will you host (operate) the site on your firm's own servers or will you outsource the hosting to a web host provider?

一旦你對網站的邏輯設計和實體設計都有了清晰的認識，你就可以開始考慮關於網站的實際操作問題. 你有很多選擇. 你既可以將全部工程外包（包括實際的系統分析與設計），也可以選擇自主開發所有的項目. 外包意味著你將雇用外部供應商來提供開發網站所涉及的服務而不是使用內部人員. 你還需要做出決定:將網站托管（運營）在公司自己的服務器上，還是將托管外包給網絡托管服務提供商?

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Build Your Own vs. Outsourcing 自主開發/外包開發
  - If you elect to build your own website, there are a range of options. Unless you are fairly skilled, using a pre-built template to create the website may be the best choice.

    如果你選擇自己開發網站，則有多種選擇. 如果開發技術不是十分完備，你可以使用模板來開發自己的網站.
  - A number of companies provide inexpensive and easy-to-use website-building tools. All of these companies also provide access to built-in e-commerce functionality. However, if you do so, you will be limited to the "look and feel" and functionality provided by the templates and infrastructure supplied by these vendors.

    許多公司提供不貴且易於使用的網站構建工具. 這些公司還提供內置的電子商務功能. 但是，如果你這樣做，你將只能使用由這些供應商提供的模板和基礎結構所提供的"外觀"和功能.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Build Your Own vs. Outsourcing 自主開發/外包開發
  - If you want more customization than a pre-built template can provide and have some programming experience, you can build the website yourself. Here, too, there are a variety of options. You can choose to build the site truly "from scratch," using HTML/HTML5 and CSS and adding interactivity with JavaScript and other programming tools. You can also use web development tools such as Adobe Dreamweaver CC and Microsoft Visual Studio, which enable developers to quickly create websites. On a larger, enterprise-wide scale, companies may choose to use top-of-the-line, prepackaged site-building tools such as Sitecore Commerce or HCL Commerce (formerly IBM WebSphere Commerce), which enable companies to create a sophisticated e-commerce presence truly customized to their specific needs.

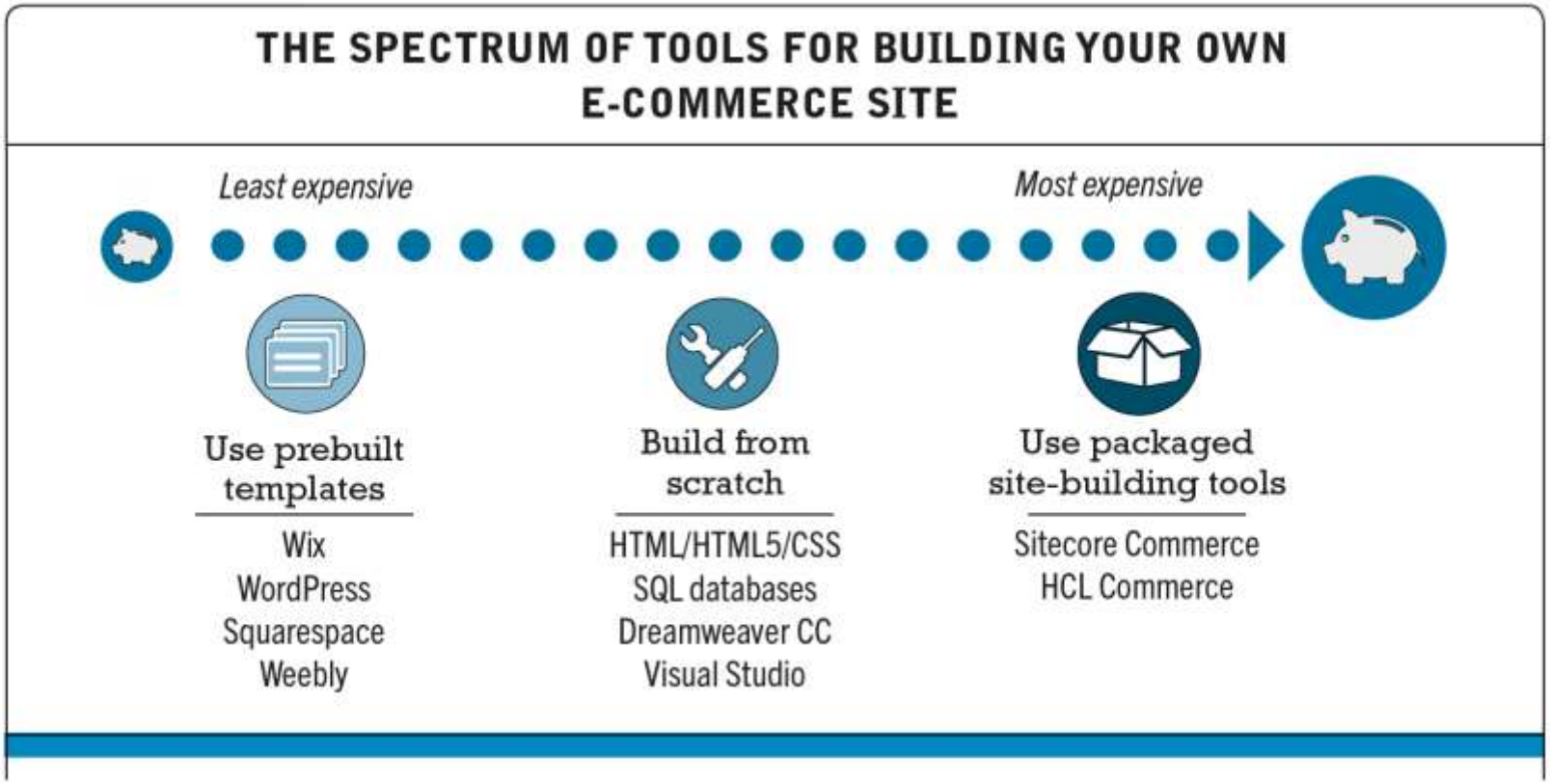
    如果你想要使用比預製的模板所能提供的更多的定制，並具有一定的編程經驗，則可以自己開發網站. 這裏也有多種選擇. 你可以選擇真正地“從頭開始”開發網站，使用HTML/HTMI5和CSS對其進行編碼，並添加與JavaScript 和其他編程工具的交互性. 你還可以使用網站開發工具，例如Adobe DreamweaverCC和Microsoft Visual Studio等，它們使開發人員能够快速創建網頁和網站. 在更大的企業範圍內，公司可以選擇使用打包的網站開發工具，例如Sitecore Commerce 或 HCLCommerce，這使它們能够開發真正根據特定需求定制的複雜電子商務網站.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Build Your Own vs. Outsourcing 自主開發/外包開發
  - The decision to build a website on your own has a number of risks. Given the complexity of features such as shopping carts, credit card authentication and processing, inventory management, and order processing, the costs involved are high, as are the risks of doing a poor job. You will be reinventing what other, specialized firms have already built, and your staff may face a long, difficult learning curve, delaying your entry to market. Your efforts could fail. On the positive side, you may be better able to build a website that does exactly what you want, and, more importantly, to develop the in-house knowledge to allow you to change the site rapidly if necessary due to a changing business environment.

    完全自主開發網站存在很多風險. 考慮到購物車、信用卡認證結算、庫存管理和訂單處理等功能的複雜性，成本很高，而最終開發出的系統有可能無法滿足企業的需求. 如果出現這種情況，你只能轉而使用其他專業公司提供的現成產品，然而員工可能需要花很長的時間重新學習，這會影響網站投入使用的進度. 這樣，你所有的努力都會付諸東流. 但是，自主開發網站的決策也有其積極的一面. 自主開發不但有可能建立完全符合企業需求的網站，更重要的是，一旦市場環境發生變化，你就可以利用自主開發網站時積累的知識迅速地調整網站，從而使網站儘快適應這些變化.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Build Your Own vs. Outsourcing 自主開發/外包開發
  - If you choose more expensive site-building packages, you will be purchasing state-of-the-art software that is well tested. You could get to market sooner. However, to make a sound decision, you will have to evaluate many different packages, and this can take a long time. You may have to modify the package to fit your business needs and perhaps hire additional outside vendors to do the modifications. Costs rise rapidly as modifications mount. A $4,000 package can easily become a $40,000 to $60,000 development project.

    如果你選擇更昂貴的網站開發工具包，則必須購買經過良好測試的最新軟件. 你可以更快地進入市場. 但是，要做出明智的決定，你將不得不評估許多不同的工具包，這可能需要很長時間. 你您可能需要修改套餐以滿足您的業務需求，並可能聘請其他外部供應商進行修改. 隨著修改的增加，成本會迅速上升. 4,000 美元的套餐很容易變成 40,000 至 60,000 美元的開發項目.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Build Your Own vs. Outsourcing 自主開發/外包開發
  - As web applications have become more sophisticated, larger retailers today rely heavily on vendors to provide sophisticated website capabilities while also maintaining a substantial internal staff. Medium-sized startups will often purchase a website design and programming expertise from vendors. Small firms seeking simple e-commerce storefronts typically use templates like those provided by WordPress, Wix, Squarespace, and Weebly.

    隨著網站變得越來越複雜，當今的大型零售商在很大程度上依靠供應商來提供複雜的網站功能，同時還需要保持大量的內部人員．小型創業企業可以使用內部技術人員從頭開始開發自己的網站，以保持較低的成本．中型初創企業通常會從供應商那裏購買網站設計和編程方面的專業知識．對於規模非常小的商鋪，可以使用 WordPress、Wix、Squarespace、Weebly提供的模板.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Host Your Own vs. Outsourcing 自主托管/外包托管
  - Few small to medium-sized businesses host their own websites anymore. Most choose to outsource hosting, which means that the hosting company is responsible for ensuring the site is “live,” or accessible, 24 hours a day. By agreeing to a monthly fee, the business need not concern itself with many of the technical aspects of setting up a web server and maintaining it, telecommunications links, nor with staffing needs.

    大多數企業選擇外包托管，即向專門提供托管服務的公司支付費用，由這些公司來負責企業網絡服務器的托管工作，確保該網站全天24小時正常運行或可訪問. 當雙方對月服務費達成一致後，大多數設置或維護服務器以及通信綫路的技術工作就不再由企業自己承擔，企業從此也不用再聘請專門的技術人員.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Host Your Own vs. Outsourcing 自主托管/外包托管
  - Co-location: Firm purchases or leases web server (with control over its operation), but server is located at vendor's facility.

    主機托管：由企業購買或租賃網絡服務器（由企業完全控制服務器的運行），再把服務器放置在托管服務商提供的機房中.
  - The vendor maintains the facility, communications lines, and the machinery. Co-location has expanded with the spread of virtualization, in which one server has multiple processors and can operate multiple websites at once with multiple operating systems. In this case, a firm does not buy the server but rents its capabilities on a monthly basis, usually at a fraction of the cost of owning the server itself. There is an extraordinary range of prices for co-location, depending on the size of the website, bandwidth, storage, and support requirements.

    供应商负责维护设施、通信线路和机器. 随着虚拟化技术的普及，主机托管也得到了扩展，在虚拟化技术中，一臺服务器拥有多个处理器，可以同时运行多个网站和多个操作系统. 在这种情况下，公司不购买服务器，而是按月租用其功能，通常只需花费拥有服务器本身成本的一小部分. 主机托管的价格范围非常广泛，取决於网站的大小、带宽、存储和支持要求.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

- Host Your Own vs. Outsourcing 自主托管/外包托管
  - While co-location involves renting physical space for your hardware, you can think of using a cloud service provider as renting virtual space in your provider's infrastructure. Cloud services are rapidly replacing co-location because they are less expensive and arguably more reliable. Unlike with co-location, your firm does not own the hardware. Cloud service providers offer a standardized infrastructure, virtualization technology, and a pay-as-you-go billing system.

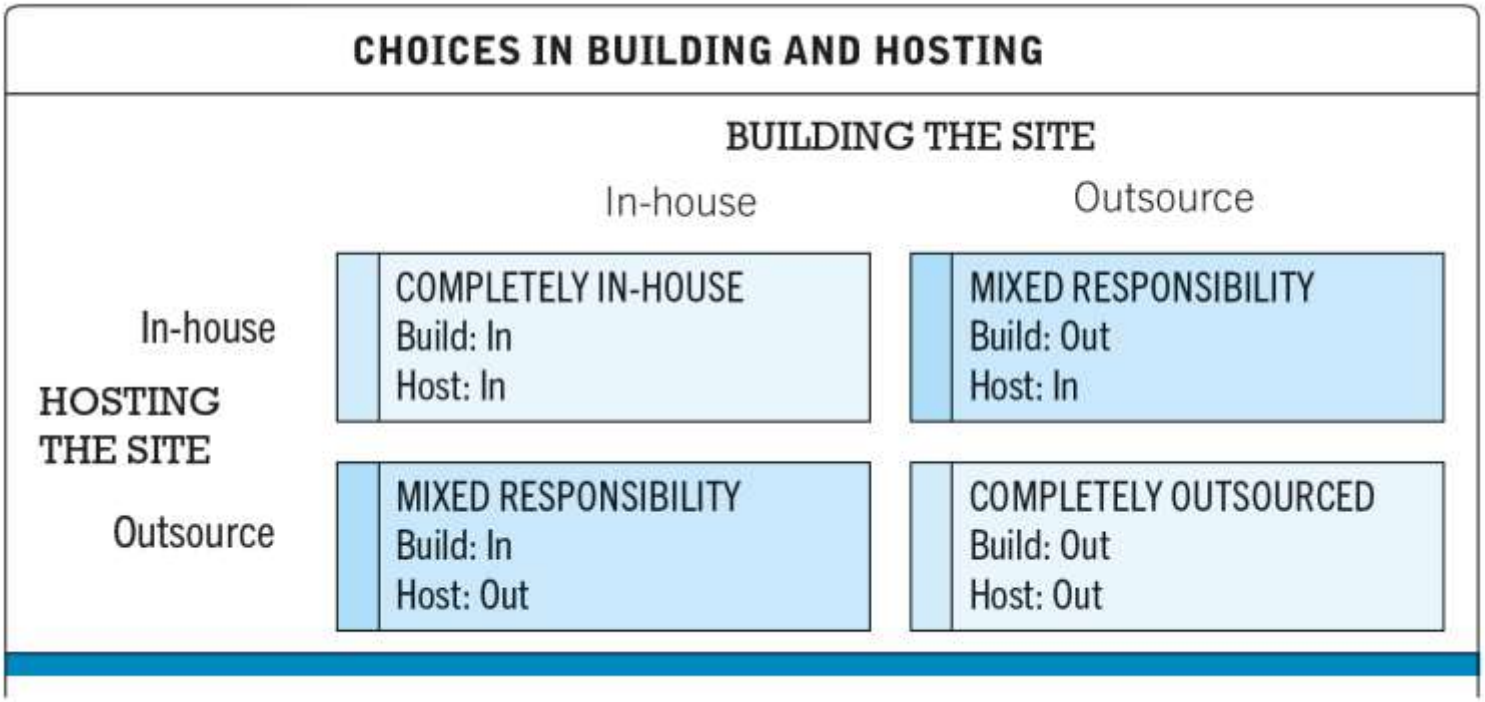
    雖然主機托管涉及爲硬件租用物理空間，但是你可以考慮使用雲服務提供商，就像在提供商的基礎架構中租用虛擬空間一樣. 雲服務因爲價格便宜且可靠性更高而正在迅速取代主機托管. 與主機托管不同，你的公司不擁有硬件. 雲服務提供商提供標準化的基礎架構、虛擬化技術，並采用即付即用的計費系統.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 3. Building the System: In-House versus Outsourcing

系統開發：自主完成與外包

| KEY PLAYERS: HOSTING/CO-LOCATION/CLOUD SERVICES | |
|---|---|
| Amazon Web Services (AWS) | Hostway |
| Bluehost | IBM Cloud |
| Digital Realty Trust | Liquid Web |
| Equinix | Microsoft Azure |
| GoDaddy | Rackspace |
| Google Cloud | Squarespace |

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System

系統測試

- Once the system has been built and programmed, you will have to engage in a testing process. Depending on the size of the system, this could be fairly difficult and lengthy. Testing is required whether the system is outsourced or built in-house. A complex e-commerce site can have thousands of pathways through the site, each of which must be documented and then tested.

  當系統開發完畢，所有程序都完成編碼後，就應進入系統測試環節，這可能相當困難且漫長. 無論是外包還是自主開發的程序，都需要進行測試. 複雜的電子商務網站可以具有數千個路徑通過該網站，每個路徑都必須記錄下來，然後進行測試.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System

系統測試

- **Unit testing** involves testing the site's program modules one at a time.

  單元測試指每次測試網站的一個程序模塊.

- **Integration testing** verifies that the major subsystems of an application work well with each other. The objective of integration testing is to uncover the errors that might result because of the way units integrate with each other.

  集成測試驗證應用程序的主要子系統是否能够良好地協同工作. 集成測試的目的是發現由於單元相互集成而可能導致的錯誤.

- **System testing** involves testing the site as a whole, in the same way a typical user would when using the site. Because there is no truly "typical" user, system testing requires that every conceivable path be tested.

  系統測試指對網站進行整體測試, 就像典型用戶在使用網站的方式. 但沒有真正的"典型"用戶, 所以系統測試需要測試所有可能出現的情況.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System

系統測試

- **Acceptance testing** requires that the firm's key personnel and managers in marketing, production, sales, and general management actually use the system as installed on a test Internet or intranet server. It verifies that the business objectives of the system as originally conceived are in fact working.

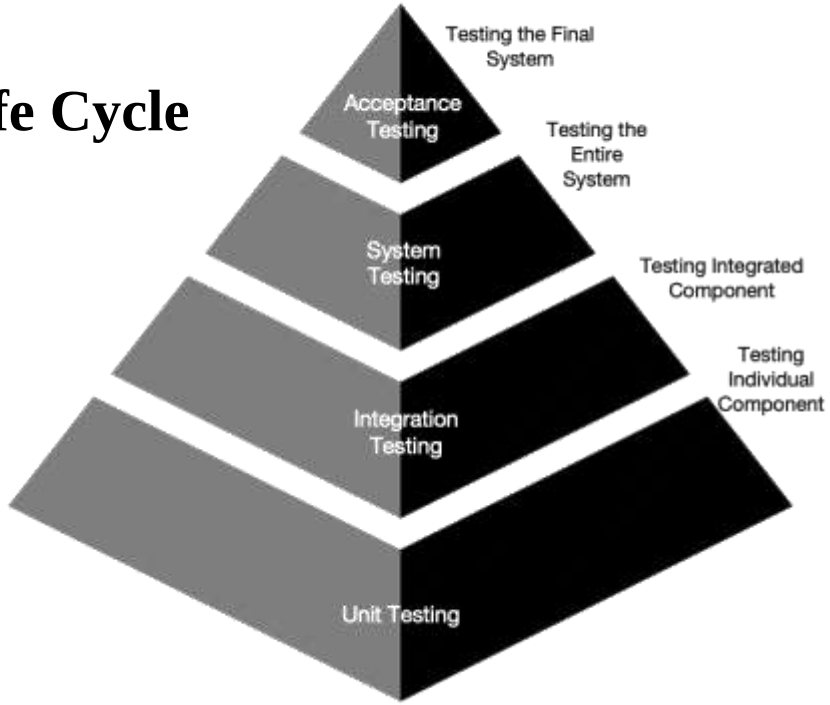
  驗收测試，即將整個系統安裝在測試用的互聯網或內聯網服務器上，由包括營銷、生產、銷售和綜合管理方面的關鍵人員和管理人員進行使用. 它檢驗企業最初設想的系統的商業目標是否確實有效.

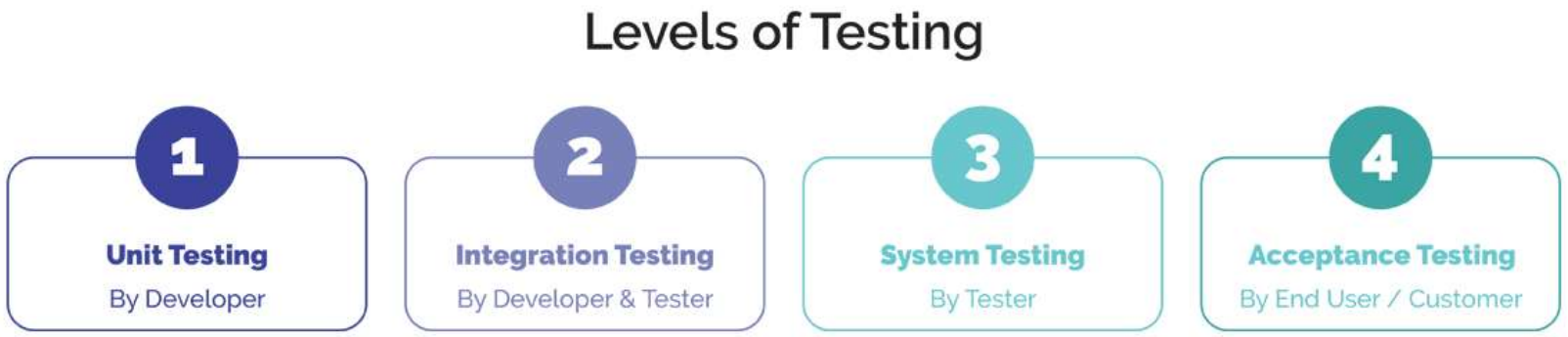
# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System

系統測試



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Unit Testing

系統測試：單元測試

**Unit testing - How To Do Unit Testing?**

- **Identify the unit:** Determine the specific code unit to be tested: either a function, method, class, or any other isolated component. Read the code and brainstorm the logic needed to test it. In this step developers should also have an idea of the cases they need to test for that unit to ensure high test coverage.

- **Choose the approach:** There are two major approaches to unit testing:
  - Manual testing: Developers manually run the code and perform the necessary interactions to see if the code works well.
  - Automated testing: Developers write a script that automates the interactions with the code.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Unit Testing

系統測試：單元測試

**Unit testing - How To Do Unit Testing?**

- **Prepare the test environment:** Set up the mock objects, prepare test data, configure the dependencies, as well as any other required preconditions. A confident developer would isolate the function for a more rigorous testing process. This practice involves copying and pasting the code into a dedicated testing environment, separate from its original context. By isolating the code, unnecessary dependencies between the code being tested and other units or data spaces in the product are uncovered.

- **Write and execute test case:** If the developer chooses the automated approach, they'll start writing the test case, usually with a Unit Test Framework. This framework (or a test runner) can be used to execute the test and produce results (whether it passed or failed).

# Building an E-Commerce Site: A Systematic Approach

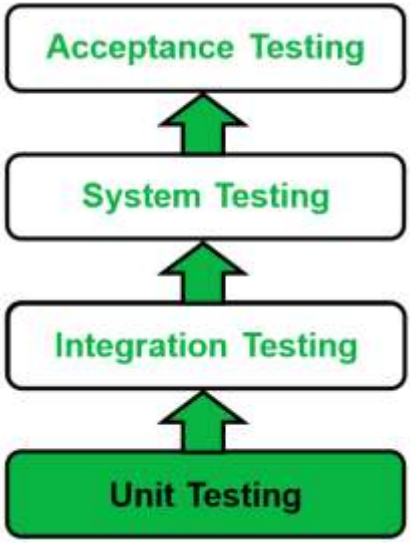
## The Systems Development Life Cycle

### 4. Testing the System: Unit Testing

系統測試：單元測試

**Unit testing - How To Do Unit Testing?**

- **Debug, fix, and confirm**: If a test case fails, developers must debug it to identify the root cause, fix the issues, then rerun the tests to confirm that the bugs have indeed been fixed.

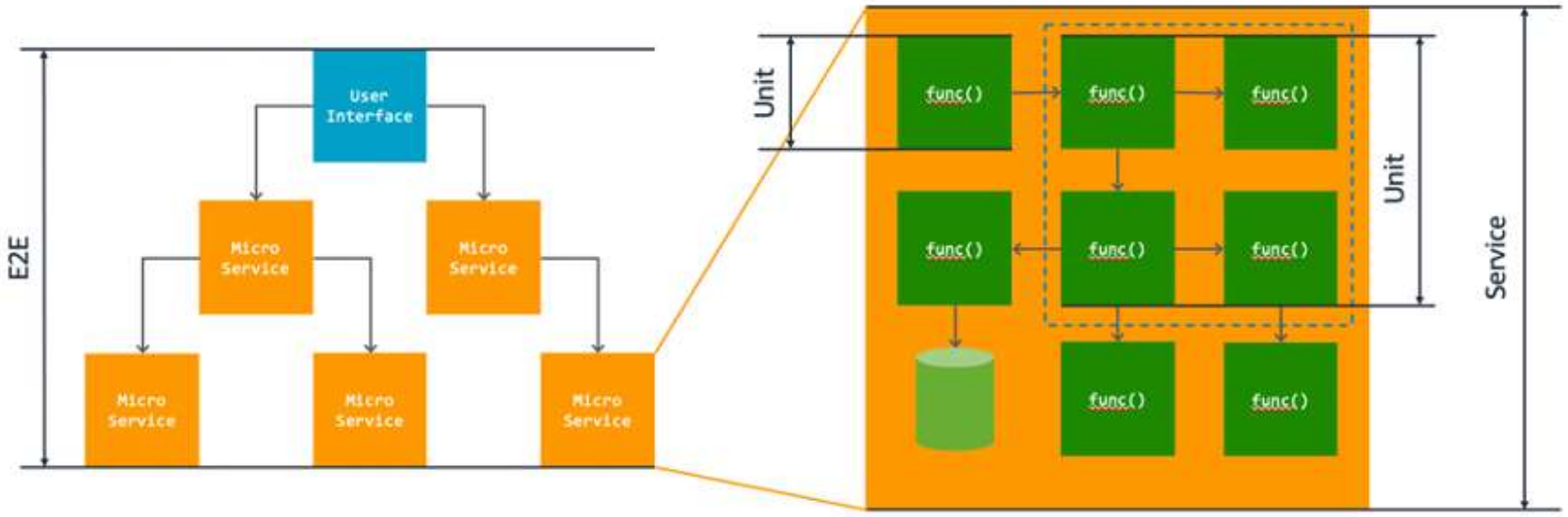


# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Unit Testing

系統測試：單元測試



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Unit Testing

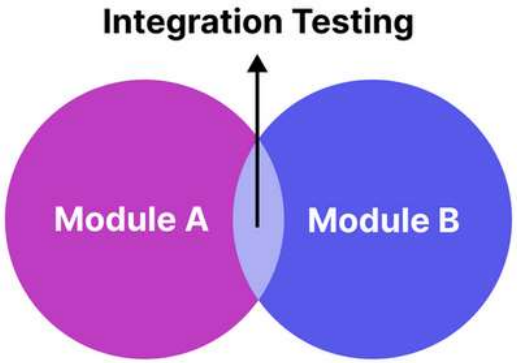
系統測試：單元測試

**Example:** Here is a unit test case for a function that calculates the sum of two numbers *a* and *b*:

```
use PHPUnit\Framework\TestCase;

class MathTest extends TestCase
{
    public function testSum()
    {
        // Arrange
        $a = 5;
        $b = 7;
        $expectedResult = 12;
        // Act
        $result = Math::sum($a, $b);
        // Assert
        $this->assertEquals($expectedResult, $result);
    }
}
```

# Building an E-Commerce Site: A Systematic Approach



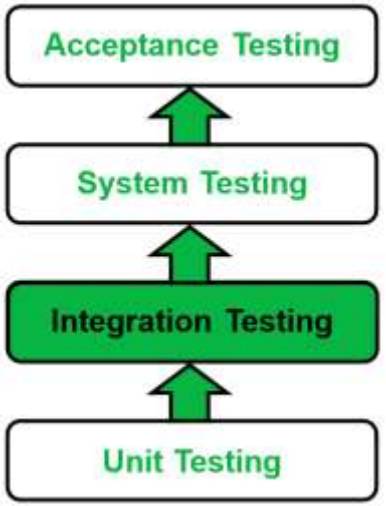

## The Systems Development Life Cycle

### 4. Testing the System: Integration Testing

系統測試：集成測試

The steps involved in integration testing are as follows:

- Prepare the test plan.
- Design test cases, test scenarios, use cases and scripts.
- Run tests after unit/module integration.
- Detect, report and fix errors.
- Retest functionalities after fixing bugs.
- Repeat the process until all bugs are found and fixed.



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Integration Testing

系統測試：集成測試

In the case of an e-commerce website, there are several integration test cases to consider:

- Verifying the interface link between the Get Started page and the Login page. Once a user enters their credentials, it is expected that the system will check if their credentials are correct, and if they are, the user will be directed to the Get Started page as a logged-in user
- Verifying that when the user inputs their information into a form, the right data is sent to the right place, in the right format
- Verify that changes to the user profile are reflected in the order history and confirmation emails.
- Verify that products are marked as out of stock when their inventory reaches zero and that they become available again when restocked.
- Verify that shipping information is accurately provided to users, and tracking updates are correctly displayed.
- Verify that the selected products are correctly added to the shopping cart and that the final order is successfully processed, updating inventory, and generating an order confirmation.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

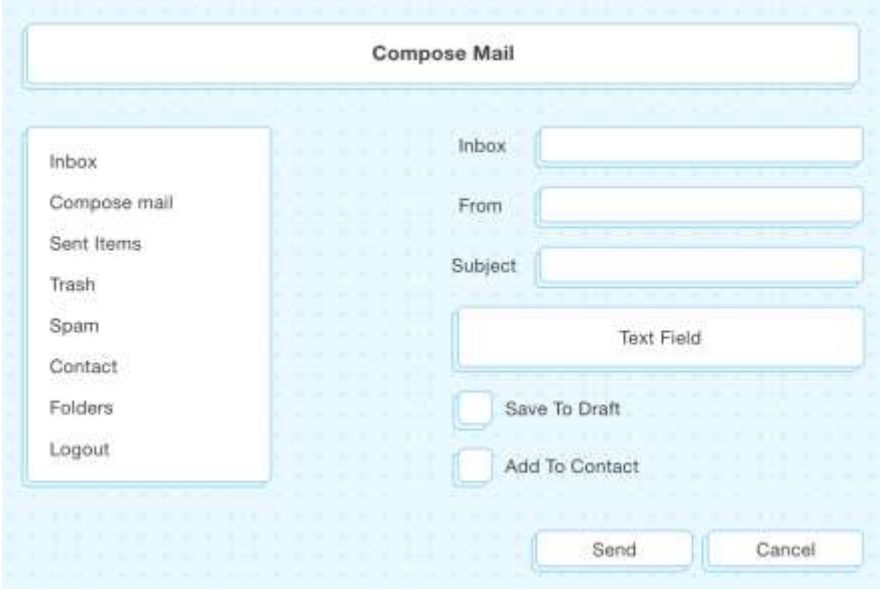
### 4. Testing the System: Integration Testing

系統測試：集成測試

**Example (Scenario 1):** Assume that you have a mail application with critical modules:

- Login page
- Mailbox module
- Delete mail module

Here you need to test: 1) the functionality of the interlinking between the login page and the mailbox page, and 2) the integration between the mailbox module and delete mails module



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Integration Testing

系統測試：集成測試

**Example (Scenario 1):** An ideal test case for such a scenario should be like this:

| Test Case ID | Test Case Objective | Test Case Description | Expected Result |
|---|---|---|---|
| 1 | Check the link between Login Page and Mailbox Module | After entering login credentials click on the login button | Get directed to Mailbox |
| 2 | Check the link between Mailbox Module and Delete Mails Module | Select an email from the Mailbox Module and click on delete | The deleted email should appear in the Trash/ Deleted folder |

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

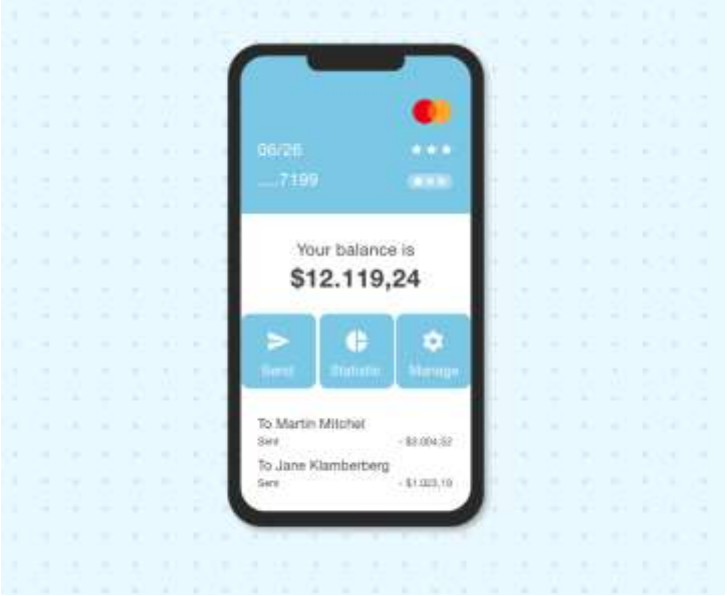
### 4. Testing the System: Integration Testing

系統測試：集成測試

**Example (Scenario 2):** Suppose you want to check integration between a large number of modules of a banking application for amount transfer functionality.

**Steps to follow:**

- First, log in as “P” and transfer an amount of $200 to a user named “Q.”
- Second step is to check for the “amount transferred” confirmation message on the screen.
- Next, cross-check if the balance of “P” is reduced by $200 after the transaction.
- Now, log out as “P” and login as “Q.”
- Navigate to the balance page to check if the amount transferred is credited to the account.



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: System Testing

系統測試：系统测試

System Testing is performed in the following steps:

- **Test Environment Setup:** Create testing environment for the better quality testing.
- **Create Test Case:** Generate test case for the testing process.
- **Create Test Data:** Generate the data that is to be tested.
- **Execute Test Case:** After the generation of the test case and the test data, test cases are executed.
- **Defect Reporting:** Defects in the system are detected.
- **Regression Testing:** It is carried out to test the side effects of the testing process.
- **Log Defects:** Defects are fixed in this step.
- **Retest:** If the test is not successful then again test is performed.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: System Testing

系統測試：系统测試

- **Real-life example of System testing**

1. Suppose a car-making company has already made systems like the ignition system, braking system, engine, fuel system, accelerator, GPS, air conditioner, etc., which were tested individually (Unit testing). The collaboration of these systems is tested(integration testing) for example the fuel system is checked in collaboration with the car engine. But when all systems are ready, the company will check all the systems working by actually driving the car to check if all the systems are working fine with each other. That will be system testing.

假設一家汽車製造公司已經製造了點火系統、制動系統、發動機、燃油系統、加速器、GPS、空調等系統，並且單獨進行了單元測試. 對這些系統的協作進行測試（集成測試），例如與汽車發動機協作檢查燃油系統. 但當所有系統準備就緒後，公司將通過實際駕駛汽車來檢查所有系統的工作情況，以檢查所有系統是否彼此正常工作. 這將是系統測試.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: System Testing

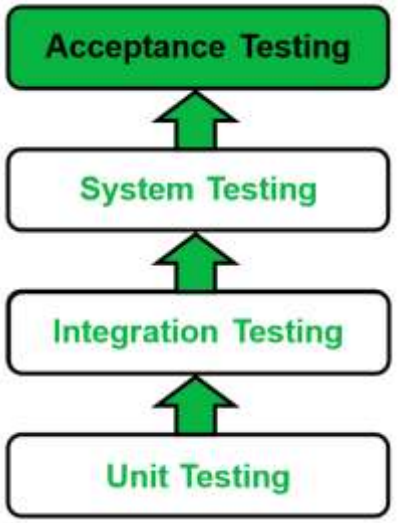
系統測試：系统测試

- **Real-life example of System testing**

2. Suppose an e-commerce website has different modules like a registration page, Login page, card, dashboard, payment page, etc. These modules are tested by the developer first, which will be unit testing. The two or more modules will be tested in collaboration with each other. That will be integration testing. But after the completion of all the modules, when the overall website functioning is tested, then that is called system testing.

假設一個電子商務網站有不同的模塊，如注册頁面、登錄頁面、卡片、儀錶板、支付頁面等. 這些模塊首先由開發人員進行測試，這將是單元測試. 兩個或多個模塊將相互協作進行測試，這將是集成測試. 但當所有模塊完成後，對網站整體功能進行測試時，就稱爲系統測試.

# Building an E-Commerce Site: A Systematic Approach




## The Systems Development Life Cycle

### 4. Testing the System: Acceptance Testing

系統測試：验收测試

- **Use of Acceptance Testing**
  1. To find the defects missed during the functional testing phase.

     找出功能测試階段遺漏的缺陷.
  2. How well the product is developed.

     產品開發得有多好.
  3. A product is what actually the customers need.

     產品是顧客真正需要的東西.
  4. Feedback help in improving the product performance and user experience.

     反饋有助於提高產品性能和用戶體驗.
  5. Minimize or eliminate the issues arising from the production.

     最大限度地减少或消除生產中出現的問題..

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Acceptance Testing

系統測試：验收测試

- **Example: User Acceptance Testing for a Password Reset Feature**

| Test Case | Steps | Expected Result |
|---|---|---|
| Verify "Forgot Password" Link Visibility | Navigate to the login page and check the visibility of the "Forgot Password" link. | The link should be visible and clickable. |
| Navigate to the Password Reset Form | Click on the "Forgot Password" link. | The user should be redirected to the password reset form. |
| Submit Password Reset Request | Enter a registered email address in the password reset form and submit the form. | A confirmation message appears, and an email is sent to the provided address. |
| Reset Password Functionality | Click on the link in the confirmation email, enter a new password, and submit it. | The user can log in with the new password. |

Testers will execute these test cases step-by-step, documenting any differences between expected and actual results. If any issues arise such as links not working or emails not being sent they will be reported for resolution.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: A/B Testing

#### 系統測試：A/B測試

- **A/B testing** (split testing) involves showing two versions (A and B) of a web page or website to different users to see which one performs better.

  A/B 測試（拆分測試）指向不同用戶顯示一個網頁或網站的兩個版本（A和B），以查看哪個版本更好.

  **Types include:**

  – A ***template test*** compares the same general page content using two different layouts and or design treatments.
  模板測試使用兩種不同的布局和/或設計方法來比較相同的頁面內容.

  – A ***new concept test*** compares a control page with one that is very different.
  新概念測試比較不同的控制頁面.

  – A ***funnel test*** compares the flow through a series of pages (such as a product page, to a registration page, to a shopping cart page, versus skipping the registration page) to see which one results in a higher percentage of conversions.

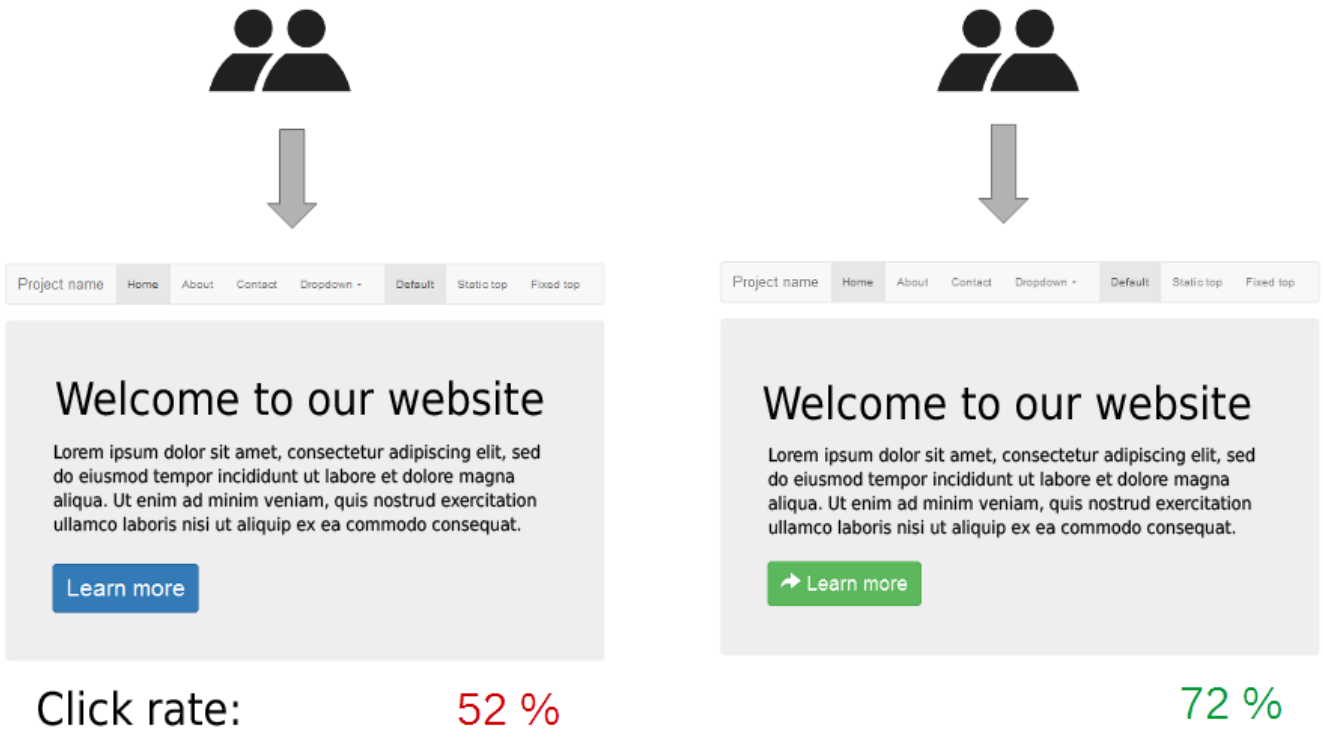
  漏斗測試會比較一系列頁面（例如產品頁面、注册頁面、購物車頁面以及跳過注册頁面）的流程，以查看哪個頁面的轉化率更高.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: A/B Testing

系統測試：A/B測試



# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Multivariate Testing

系統測試：多變量測試

- **Multivariate testing** is a much more sophisticated form of testing than A/B testing. Multivariate testing involves identifying specific elements, or variables, on a web page, such as a headline, image, button, and text, creating versions for each element, and then creating a unique combination of each element and version to test. When used correctly, multivariate testing enables designers to identify the most optimal layout, color, content, and format.

  多變量測試是一種比A/B測試更複雜的測試. 多變量測試涉及識別網頁上的特定元素或變量，例如標題、圖像、按鈕和文本，爲每個元素創建版本，然後創建每個元素和版本的唯一組合以進行測試. 如果使用得當，多變量測試使設計人員能够確定最優化的布局、顏色、內容和格式.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 4. Testing the System: Multivariate Testing

系統測試：多變量測試


In this example, notice how each variation plays with placement, color, style, and format. Unlike A/B testing, the differences in variables in a multivariate testing may be more subtle.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 5. Implementation and Maintenance

運行和維護

- Maintenance is ongoing

  持續不斷進行維護

- Maintenance costs: Similar to development costs

  維護開支：與開發成本大體相當

  – A $40K e-commerce site may require $40K annually to upkeep.

    一個電子商務網站的開發費用爲4萬美元, 則該網站的年維護費用也要將近4萬美元.

- An important task of the web team is benchmarking (a process in which the site is compared with those of competitors in terms of response speed, quality of layout, and design) and keeping the site current on pricing and promotions.

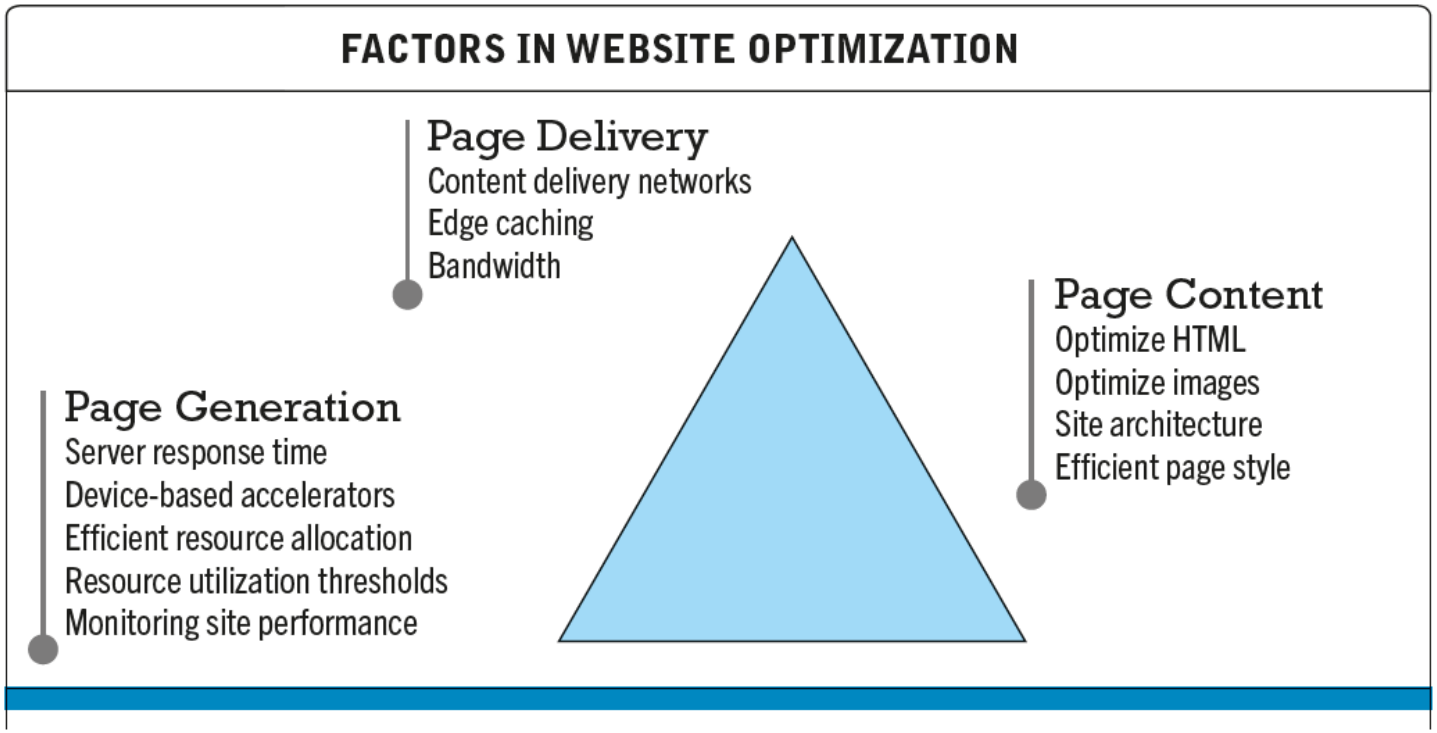
  Web團隊的一項重要任務是基準測試（在響應速度、布局質量和設計方面將網站與競爭對手的網站進行比較的），確保企業的網站在價格和促銷方面保持優勢.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 5. Implementation and Maintenance:

運行和維護




Website optimization requires that you consider three factors: page content, page generation, and page delivery.

# Building an E-Commerce Site: A Systematic Approach

## The Systems Development Life Cycle

### 5. Implementation and Maintenance

運行和維護

- The purpose of an e-commerce website is to deliver content to customers and to complete transactions. The faster and more reliably these two objectives are met, the more effective the website is from a commerce perspective. If you are a manager or marketing executive, you will want the website operating in a way that fulfills customers' expectations. You'll have to make sure the website is optimized to achieve this business objective.

  電子商務網站的目的是向客戶提供內容並完成交易. 這兩個目標實現得越快、越可靠，從商業角度來看，網站就越有效. 如果您是經理或營銷主管，您會希望網站的運營方式能够滿足客戶的期望. 您必須確保網站經過優化才能實現此業務目標.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- **Prototyping** consists of building a sample or model rapidly and inexpensively to test a concept or process. The initial prototype can be iteratively refined based on feedback until it satisfies user requirements. Prototyping is particularly useful for user interface design (often referred to as front-end design). There are various ways to prototype, ranging from simple paper sketches, to wireframing (creating a "skeleton" version that focuses on functionality rather than design), to using software tools to create clickable mockups, to building an actual prototype in, for example, HTML, CSS, and JavaScript.

  **原型設計**包括快速、不貴地構建樣本或模型以測試概念或過程可以根據反饋反復地完善初始原型，直到滿足用户的需求爲止. 原型設計對於用户界面設計（通常稱爲前端設計）特別有用. 原型設計的方法有很多種，從簡單的草圖到綫框圖（創建側重於功能而不是設計的"骨架"版本），再到使用軟件工具創建可點擊的模型，再到用 HTML、CSS和JavaScript 構建實際的原型.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- **Agile development** breaks down a large project into a series of smaller subprojects that are completed in short periods of time using iteration and continuous feedback. Improvement or addition of new functionality takes place within the next iteration as developers clarify requirements. This helps to minimize the overall risk and allows the project to adapt to changes more quickly. Agile methods emphasize face-to-face communication over written documents, encouraging people to collaborate and make decisions quickly and effectively. **Scrum** is a type of agile development that provides a framework for managing the development process. The Scrum process typically involves a cross-functional team headed by a "coach" and uses the concept of a "sprint," during which the team takes a small set of features of the project from idea to code to tested functionality and integrates them into the end product..

  **敏捷開發**將大型項目分解爲一系列較小的子項目，這些子項目可在短時間內通過迭代和連續反饋的方式來完成. 開發人員會明確要求，新功能的改進或添加將在下一次迭代中進行. 這有助於最大限度地降低總體風險，並使項目更快地適應變化. 敏捷開發强調面對面的交流比只看文檔更有效，鼓勵人們快速有效地進行協作並做出決策. **Scrum**是一種敏捷開發方法，提供了用於管理開發過程的框架. Scrum流程通常涉及由"教練"領導的跨職能團隊，並使用"衝刺"的概念，在此期間，團隊使項目的一小部分特性從構思到代碼再發展爲經過測試的功能，然後將其集成到最終產品上.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- **DevOps** also builds on agile development principles as an organizational strategy to create a culture and environment that further promote rapid and agile development practices. DevOps stands for “development and operations” and emphasizes close collaboration between the developers who create applications and the operational staff who run and maintain the applications. DevOps aims to promote better and more frequent communication and collaboration between systems development and operations groups and a fast and stable workflow throughout the entire development life cycle. With this type of organizational change along with agile techniques, standardized processes, and more powerful automated software creation and testing tools, it is possible to release more reliable applications more rapidly and more frequently.

  **DevOps**還基於敏捷開發原則創建了一種文化和環境，以進一步促進快速敏捷開發實踐. DevOps代指“開發和運營”，並强調促進App的開發人員與運行和維護App的運營人員之間的緊密合作. DevOps旨在促進系統開發和運營團隊之間更好和更頻繁地溝通與協作，以及在整個開發生命周期中構建快速、穩定的工作流程. 通過這種伴隨著敏捷技術、標準化流程以及更强大的自動化軟件創建和測試工具的組織變革，企業可以更快、更頻繁地發布更可靠的 APP.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- Component-based development takes advantage of the functionality offered by object-oriented programming tools. **Component-based development** enables a system to be built by assembling and integrating various software components that already have been assembled and that provide common functions such as a user interface or online ordering capability. Businesses are using component-based development to create their e-commerce applications by combining commercially available components for shopping carts, user authentication, search engines, and catalogs with pieces of software for their own unique business requirements.

  基於組件的開發利用了面向對象的編程工具提供的功能. **基於組件的開發**使系統可以通過組裝和集成各種已經組裝好的軟件組件來構建，這些軟件組件可以提供諸如用戶交互或在綫訂購之類的通用功能. 企業正在使用基於組件的開發來創建電子商務應用程序，方法是將用於購物車、用戶身份驗證搜索引擎和目錄的商用組件與滿足其獨特業務需求的軟件相結合.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- **Web services** are loosely coupled, reusable software components that use Extensible Markup Language (XML) and other open protocols and standards to enable one application to communicate with another via an application programming interface (API) without requiring any custom programming to share data and services. In addition to supporting internal and external integration of systems, web services can be used as tools for building new information system applications or enhancing existing systems. Because these software services use a universal set of standards, they can be less expensive and less difficult to weave together than proprietary components. Web services can perform certain functions on their own and can also engage other web services to complete more complex transactions, such as checking credit, procuring products, or ordering products. By creating software components that can communicate and share data regardless of the operating system, programming language, or client device, web services can provide significant cost savings in systems building while opening up new opportunities for collaboration with other companies.

  **Web服務**是鬆散耦合、可重用的軟件組件，它使用可擴展標記語言，以及其他開放協議和標準，使一個應用程序能够通過應用程序接口與另一個應用程序通信，而無須自定義編程來共享數據和服務. 除了支持系統的內部和外部集成之外，網絡服務還可以用作構建新信息系統應用程序或增强現有系統的工具. 由於這些軟件服務使用一套通用標準，因此與專有組件相比，它們的成本和組合起來的難度更低. 網絡服務可以自行執行某些功能，也可以使用其他網絡服務來完成更複雜的交易，例如核查信用、采購或訂購産品. 通過創建可以在不考慮操作系統、編程語言或客戶機設備的情況下通信和共享數據的軟件組件，網絡服務可以顯著地降低系統構建成本，同時爲與其他公司的合作創造了新的機會.

# Building an E-Commerce Site: A Systematic Approach

## Alternative Web Development Methodologies 其他網站開發方法

- Web services are the preferred method of implementing a **service-oriented architecture (SOA)**, a style of software design that employs a set of self-contained services that communicate with each other to create a working software application. SOA allows for the reuse of existing assets, enabling the creation of new services from an existing IT infrastructure of systems, as well as interoperability, which permits different web services to run on a variety of software platforms and hardware architectures. **Microservices** are a very granular implementation of SOA in which an application is decomposed into a number of smaller services, each responsible for a discrete task that can communicate with other services to solve a larger, complex business problem. A key advantage of a microservices focus is that they can be built and deployed independently, making it easier to isolate errors specific to the service as well as scale them independently of the applications that use them.

Web服務是實現**面向服務的架構**的首選方法. SOA 是一種軟件設計風格，它采用一組相互通信的自包含服務來創建可工作的應用程序. SOA允許重複使用現有資產，支持在系統的現有IT基礎架構上創建新服務，以及互操作性，允許不同的網絡服務在各種軟件平臺和硬件架構上運行. **微服務**是對 SOA的一種非常細化的實施，其中一個應用程序被分解爲許多較小的服務，每個服務負責一個離散任務，這些任務可以與其他服務通信以解決更大的業務問題. 微服務的一個關鍵優勢是它們可以獨立構建和部署，從而更容易避開某個服務的錯誤對自己的影響，以及避免使用它們的應用程序改變自己.

# Exercise (Part I)

**1) Which of the following types of e-commerce presence is best suited for creating an ongoing conversation with one's customers?**
A) website
B) e-mail
C) social media
D) offline media

**2) In order from beginning to end, the major steps in the SDLC are:**
A) systems analysis/planning; systems design; building the system; testing; and implementation
B) systems design; testing; building the system; and implementation
C) systems analysis/planning; systems design; building the system; implementation; and testing
D) systems analysis/planning; implementation; building the system; and testing

**3) _____ are the types of information systems capabilities needed to meet business objectives.**

# Exercise (Part I)

**4) The basic system functionality _____ is used to display goods on a website.**

**5) Which system functionality must your website have in order to be able to personalize or customize a product for a client?**

A) an ad server
B) a site tracking and reporting system
C) an inventory management system
D) customer on-site tracking

**6) Which of the following are the two main components of a systems design?**

A) logical design and physical design
B) behavioral design and technological design
C) business objectives and technology requirements
D) front-end systems and back-end systems

# Exercise (Part I)

**7) Which of the following is *not* one of the basic business objectives for an e-commerce site?**
A) display goods
B) execute a transaction
C) provide production and supplier links
D) optimize system architecture

**8) All of the following are basic information requirements for a product database *except*:**
A) product descriptions
B) stock numbers
C) customer ID numbers
D) inventory levels

**9) _____ typically include a data flow diagram to describe the flow of information for an e-commerce site.**

# Exercise (Part I)

**10) _____ details the actual hardware components to be used in a system.**

**11) ____ testing verifies that the business objectives of the system as originally conceived are in fact working.**

**12) Which of the following involves testing a site program's modules one at a time?**

A) system testing
B) acceptance testing
C) unit testing
D) implementation testing

# Exercise (Part I)

**13) Most of the time required to maintain an e-commerce site is spent on:**
A) debugging code
B) responding to emergency situations
C) general administration and making changes and enhancements to the system
D) changes in reports, data files, and links to backend databases

**14) All of the following are simple steps for optimizing web page content that can reduce response times except:**
A) reducing unnecessary HTML comments
B) segmenting computer servers to perform dedicated functions
C) using more efficient graphics
D) avoiding unnecessary links to other pages on the site

**15) Which of the following is the minimum system architecture requirement for an e-commerce website that processes orders?**
A) single-tier architecture
B) two-tier architecture
C) three-tier architecture
D) multi-tier architecture

# Exercise (Part I)

**16) Which form of testing compares a control page with one that is very different?**
A) template test
B) new concept test
C) funnel test
D) system test

**17) A template test is a form of which type of testing?**
A) unit testing
B) system testing
C) acceptance testing
D) A/B testing

**18) When using multivariate testing, if you wish to test two different versions of an image, a button, and a piece of text, _____ combinations will you need to test.**

# Exercise (Part I)

**19) Which of the following statements is not true?**
A) The SDLC methodology that can be used to create an e-commerce website has five major steps
B) When developing an e-commerce presence, it is important to understand that the business must drive technology decisions
C) Two-tier architecture typically includes a web server and a database server
D) The annual maintenance cost for a website is typically much lower than its development cost

**20) All of the following might be part of a website's middle-tier layer *except:***
A) a database server
B) an ad server
C) legacy corporate applications
D) a mail server

**21) All of the following are basic functionality provided by web servers *except*:**
A) site management tools
B) data capture tools
C) security services
D) a shopping cart

# Exercise (Part I)

**22) _____ is used to process certificates and private/public key information.**
A) HTTP
B) Secure Sockets Layer/Transport Layer Security
C) File Transfer Protocol
D) Data capture

**23) Which of the following would you use to verify that links on web pages are valid?**
A) HTTP
B) FTP
C) data capture tools
D) site management tools

**24) Advantages of dynamic page generation include all of the following *except*:**
A) lowered menu costs
B) market segmentation
C) nearly cost-free price discrimination
D) client-side execution of programming

**1. What is systems development life cycle (SDLC)? Give a graph that can illustrates the major steps involved in the systems development life.**

**2. What are logical design and physical design? Give a data flow diagram that can show a logical design and a physical design for a very simple website.**