

# UNIT 2: E-Commerce Models and Strategies

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## 3.1 Electronic Data Interchange (EDI)

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### 3.1.1 Definition

Electronic Data Interchange (EDI) is the **computer-to-computer exchange** of structured business documents in a standardized electronic format, eliminating paper, faxes, and manual intervention.

### 3.1.2 Types of EDI

#### 1. Point-to-Point (Direct EDI)

- **Architecture:** Secure, dedicated link between two trading partners
- **Pros:** High security, predictable performance
- **Cons:** High setup and maintenance cost; one-to-one only

#### 2. EDI via Value-Added Network (VAN)

- **Architecture:** Third-party mailbox/translator service
- **Pros:** Simplifies connectivity (many-to-many), built-in auditing
- **Cons:** Per-message fees; possible latency

#### 3. Web-EDI

- **Architecture:** Browser-based portal; no local translation software
- **Pros:** Low cost of entry; easy for low-volume partners
- **Cons:** Manual entry overhead; limited integration

#### 4. Mobile EDI

- **Architecture:** Uses mobile devices (smartphones, tablets) with EDI apps
- **Pros:** On-the-go access, real-time notifications
- **Cons:** Smaller screens limit complexity; security of device

### 3.1.3 EDI Standards

- **ANSI ASC X12 (North America):**
    - 300 transaction sets (e.g., 810 = Invoice, 850 = Purchase Order)
  - **UN/EDIFACT (International):**
    - Multi-sector, multilingual; segments like UNH...UNT envelopes
  - **TRADACOMS (UK Retail):**
    - Early retail-sector standard; largely superseded by EDIFACT
  - **ODETTE (Automotive Europe):**
    - Messages for supply-chain (e.g., DELFOR = Delivery Forecast)
  - **XML-Based (ebXML, cXML):**
    - Human-readable, integrates with web services; uses namespaces
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### 3.1.4 EDI Security and Privacy Issues

#### 1. Authentication & Non-Repudiation

- Digital signatures with PKI ensure sender identity and message origin cannot be denied.

#### 2. Confidentiality

- Payload encryption (PGP, S/MIME, SSL/TLS) to protect content from eavesdropping.

#### 3. Integrity

- Hashing (SHA-256) plus signature to detect tampering.

#### 4. Access Control

- Role-based permissions on VAN mailboxes or AS2 endpoints.

#### 5. Audit & Logging

- Transaction logging, acknowledgement (997/999) tracking for non-repudiation.

#### 6. Data Privacy

- Field-level masking/encryption for PII (customer data, pricing).
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### 3.1.5 EDI Implementation Steps

#### 1. Partner & Document Definition

- Identify trading partners, document types (e.g., ORDERS, INVOIC), and transaction volumes.

#### 2. Choose Standards & Protocol

- Select ANSI X12 vs. EDIFACT; communication protocol (AS2, FTP-SSL, VAN).

#### 3. Data Mapping & Translation

- Map internal fields → EDI segment.element (e.g., N1.01 = “BY” for buyer).
- Use translation tools or middleware (Gentran, BizTalk).

#### 4. Connectivity Setup

- Establish network links, configure AS2 certificates or VAN mailboxes.

#### 5. Testing & Certification

- Syntax tests (TA1), functional/business-rules tests, end-to-end partner validation.

#### 6. Production & Monitoring

- Go-live; monitor transmissions, exceptions, acknowledgements.

#### 7. Maintenance

- Update mappings for new partner requirements or document versions.
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### 3.1.6 EDI Document Structure

```
ISA|00|          |00|          |ZZ|SENDERID      |ZZ|RECEIVERID
|210517|1200|U|00401|000000905|0|P|>
GS|P0|SENDERID|RECEIVERID|20210517|1200|1|X|004010
ST|850|0001
BEG|00|NE|P012345||20210517
N1|BY|BUYER  NAME|92|123
N1|SE|SELLER  NAME|92|456
P01|1|10|EA|15.00||VN|ABC123||IN|ITEMDESC
CTT|1
SE|8|0001
GE|1|1
IEA|1|000000905
```

- **Interchange Envelope (ISA...IEA)**
- **Functional Group (GS...GE)**
- **Transaction Set (ST...SE)**
- **Segments & Data Elements** with separators (|, ~)

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## 3.2 Electronic Catalogs & Digital Libraries

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### 3.2.1 Electronic Catalogs

- **Definition:** Digitally-accessible product/service listings with rich metadata, pricing, images, and ordering.
- **Key Components:**
  - **Product Attributes:** SKUs, descriptions, technical specs
  - **Search & Navigation:** Faceted filters, full-text search, categories
  - **Pricing & Promotions:** Dynamic pricing, discount rules
  - **Order Integration:** “Add to Cart” APIs connecting to backend order management

#### Example Flow:

1. User searches “laptop” → filter by brand, price range.
2. Selects item → views detail page with image gallery, specs, availability.

3. Clicks “Add to Cart” → cart API updates session/cart DB.

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### 3.2.2 Digital Libraries

- **Definition:** Networked repositories of digital content (documents, images, audio, video) with indexing, retrieval, and rights management.
  - **Metadata Standards:**
    - **Dublin Core:** Title, Creator, Subject, Date
    - **MARC21:** Library cataloging format
  - **Functionalities:**
    - **Full-Text Search & OCR:** Search within scanned documents
    - **Access Control:** Public vs. restricted collections; DRM for licensed content
    - **Digital Preservation:** Format migration, checksums for integrity
  - **Use Cases:** Academic research, corporate knowledge management, archival.
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## 3.3 E-Governance

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### Definition

Use of ICT by governments to deliver services, share information, and engage citizens, with the goals of transparency, efficiency, and participation.

### Domains & Examples

1. **G2C (Government-to-Citizen):**
  - Online tax filing (e-filing portals)
  - e-Voting systems
  - Public grievance redressal (CPGRAMS)
2. **G2B (Government-to-Business):**
  - e-Procurement (GeM portal)

- Licensing and compliance dashboards

### 3. G2G (Government-to-Government):

- Inter-agency data sharing via secure APIs
- Centralized ID systems (Aadhaar)

### 4. G2E (Government-to-Employee):

- HR self-service portals
- e-Learning and training platforms

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## 3.4 E-Buying

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### Definition

Procurement of goods/services electronically by organizations or individuals, encompassing requisition, approval, and purchase processes.

### Models

1. **B2C (Retail Buying):** Customer-facing online stores
2. **B2B (Corporate Buying):**
  - **Procurement Portals:** Punch-out catalogs integrated with ERP
  - **Reverse Auctions:** Suppliers bid to win contracts
3. **Group Buying:** Collective purchasing for volume discounts (Groupon)

### Workflow

1. **Requisition:** User selects items from electronic catalog → submits request.
2. **Approval:** Workflow routes to managers based on policies.
3. **Purchase Order:** Approved requisition converted to PO → sent via EDI/XML.
4. **Receipt & Invoice:** Goods received, invoices matched via 3-way match (PO, receipt, invoice).

5. **Payment:** Automated through e-payment systems (ACH, RTGS).
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## 3.5 E-Selling

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### Definition

Online marketing and sale of products/services through web storefronts, marketplaces, or social channels.

### Models & Channels

- **Direct-to-Consumer (D2C):** Brand's own e-store
- **Marketplace:** Third-party platforms (Amazon, Flipkart)
- **Dropship:** Seller lists products but supplier ships directly
- **Social Commerce:** Shoppable posts/stories on Instagram, Facebook

### Key Components

- **Product Information Management (PIM):** Central repository for product data
  - **Content Delivery Network (CDN):** Fast global access to images, videos
  - **Shopping Cart & Checkout:** Secure sessions, cart persistence
  - **Payment Gateway Integration:** PCI DSS compliance, multi-currency support
  - **Order Management System (OMS):** Tracks orders, communicates with warehouse
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## 3.6 E-Banking

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### Definition

Delivery of banking products and services via digital channels (web, mobile apps).

### Core Services

- **Account Management:** Balance inquiry, statements, alerts

- **Funds Transfer:** NEFT, RTGS, IMPS, UPI
- **Bill Payments & Recharge:** Utility, credit card, mobile top-up
- **Investments & Loans:** Mutual funds, SIPs, loan applications

## Security Mechanisms

### 1. User Authentication:

- Multi-factor (password + OTP/biometric)
- Device fingerprinting

### 2. Session Security:

- SSL/TLS encryption
- Session timeouts, re-authentication for critical ops

### 3. Transaction Monitoring:

- Real-time fraud detection (rule-based and ML-based)
- Velocity checks, anomaly detection

### 4. Regulatory Compliance:

- RBI guidelines, PCI DSS, KYC/AML checks

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## 3.7 E-Retailing

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### Definition

The sale of goods/services to end-consumers via the Internet, combining marketing, distribution, and customer service.

### Business Models

- **Pure-play e-tailers:** Online-only operations (e.g., Myntra)
- **Click-and-Mortar:** Online + physical stores (e.g., Big Bazaar)
- **Subscription-Based:** Recurring delivery (e.g., monthly product boxes)



## Value Chain Components

1. **Channel Integration:** Unified inventory across online and offline

2. **Logistics & Fulfillment:**

- Warehousing strategy (centralized vs. hub-and-spoke)
- Last-mile delivery partners, reverse logistics for returns

3. **Customer Experience:**

- Personalization engines (recommendations)
- Omnichannel support (chatbots, call centers, in-store pickup)

4. **Analytics & Optimization:**

- A/B testing for UI/UX
  - Demand forecasting, dynamic pricing
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