

# Curs 8

## - Management Logistic

- E-Logistics in cadrul E-Commerce-partea 2

Galatus Ramona

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# E-commerce

## × Comertul virtual

- + Asigura acelasi rang pentru activitatile de comert pentru o societate de bussiness mic ca cel pentru o corporatie de dimensiuni mari
- + Servicii de tip B2B si B2C, de cost mic si in timp real
- + Reducerea timpului de inventariere si a timpului per-global (time cycle)
- + E-store, e-catalog, e-order entry, e-payment
- + Interfete Web pentru :
  - × requests for quotations (RFQ),
  - × requests for information (RFI),and
  - × requests for proposals (RFP)

Link : <http://www.wimbosman.be/en/e-logistics/introduction.aspx>

<http://www.epple.co.uk/>

# Aplicatii electronice logistica

Advertising  
Distance learning  
Electronic conferencing  
Electronic mail (e-mail)  
Electronic posting  
Health-care management  
Home shopping  
Interactive games  
Inventory management  
Marketing  
Newsgroups and discussions  
News on demand  
Online banking  
Online employment  
Online software distribution  
Online training  
Politics (voting, participating in political forums and chat groups, keeping in touch with the White House, Senate, and the Congress, using the Web for political fundraising).  
Remote login  
Sale of products and services  
Software distribution  
Telecommuting  
Transferring files with file transfer protocol (FTP)  
Video on demand  
Videophones  
Virtual classrooms bring the world into your home anywhere in the world with Internet connection by tapping into expertise throughout the world.  
Online demo of products and services throughout the world  
Virtual reality games

"home-sourced" employee.

# Ce este necesar

- ✘ O conexiune la Internet (ISP)
- ✘ Acces direct (Internet) sau securizat (Intranet, Extranet) pe baza unui cont
- ✘ Un browser
- ✘ O aplicatie specifica
  - + cu continut fix – ex de tool pentru e-commerce Zen Cart - <http://www.zen-cart.com/showcase.php?do=showcat&catid=14> , Referinta - “E-commerce Application Development – A step by step application development”
  - + sau variabil (care sa fie actualizat periodic) – cu o BD (baza de date -consistenta)- pagini web, SAP
- ✘ Un server de BD (SQL Server sau Oracle)
- ✘ BD cu continut personalizat tipului de activitati specifice organizatiei (ex. Nr de depozite, nr de angajati, numar departamente etc.)

Link referinta- <http://www.consumerreports.org/cro/index.htm>

Link utilizare statistica a internet-ului:<http://www.internetworldstats.com/top20.htm>

# Caracteristici

## Major Beneficiaries of E-Commerce

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Banks  
Entertainment  
Government -administratie  
Insurance -asigurari  
Marketing  
Online publishing -publicatii on-line  
Retailers -comercianti  
Training -cursuri de formare  
Travel industries -turism  
Universities

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## Business Uses of the Internet

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Buying and selling products and services  
Collaborating with others  
Communicating within organizations  
Gathering information  
Gathering information on competitors  
Providing customer service  
Providing software update and patches  
Providing vendor support  
Publishing and disseminating information

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## Popular Products and Services Purchased Online

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Airline tickets and travel  
Apparel and footwear  
Banking services  
Books and music  
Computer hardware, software, and other electronics  
Flowers and gifts  
Stock brokerage services

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## E-Commerce versus Traditional Commerce

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Activity	Traditional commerce	E-commerce
Product information	Magazines, flyers	Web sites Online catalogs
Business communications	Regular mail, phone	E-mail
Check product availability	Phone, fax, letter	E-mail, web sites, and extranets <sup>a</sup>
Order generation	Printed forms	E-mail, web sites
Product acknowledgments	Phone, fax	E-mail, web sites, and EDI <sup>b</sup>
Invoice generation	Printed forms	Web sites

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<sup>a</sup>Extranets are the connection of two or more intranets. Intranets are internal networks that use web technologies. (They both will be discussed in Chapter 4.)

<sup>b</sup>Electronic data interchange (discussed in Chapter 5).

## Keywords

- Information requirements in logistics and supply chain
- IT standards in business
- Flows of information and their effects
- Electronic Data Interchange (EDI) principle
- Identification systems – barcode and RFID
- Stock management systems
- Planning of transports and runs
- Enterprise Resource Planning (ERP)
- E-logistics

# How to work with EDI?



www.ccv.cz/en



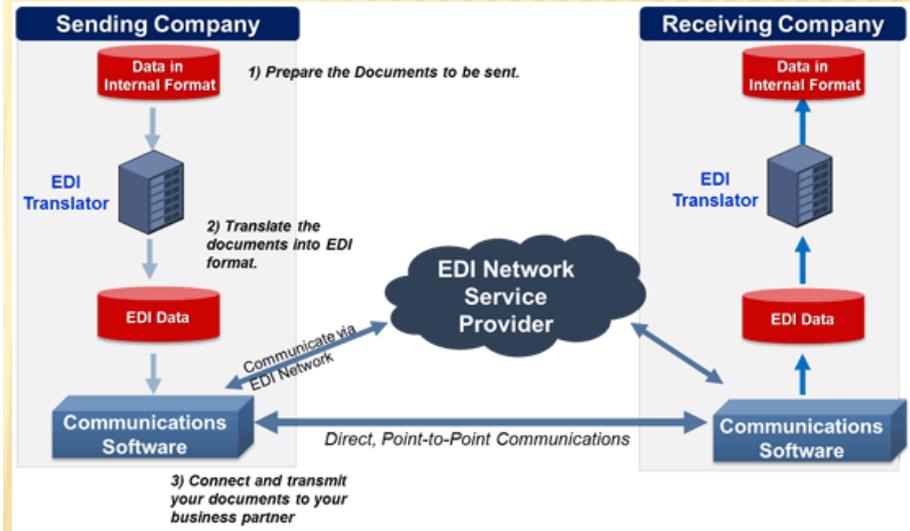
## What is EDI?

**Electronic Data Interchange** is an acknowledged technology for paperless processing of sales and purchase. Business partners exchange structured documents with one another in an electronic form.



## An evolution in sending business and other documents between independent subjects

	<h3>Paper invoice</h3>	<p><b>The costs of processing an invoice in CR</b></p> <ul style="list-style-type: none"> <li>1 € Issued invoice</li> <li>0,4 € Received invoice</li> </ul> <p><b>Paper invoice in the world</b> (Source: TradeShift)</p> <ul style="list-style-type: none"> <li>8-10 % of paper invoices contain an error</li> <li>20-40 % of paper invoices are disputed</li> <li>60-80 % of company waste is paper</li> <li>96 % of companies create one new invoice at least once a year</li> </ul>
	<h3>Web EDI</h3>	<ul style="list-style-type: none"> <li>The fastest and easiest way to start with EDI</li> <li>Independent of an information system</li> <li>A web browser needed only</li> <li>Low price</li> <li>The disadvantage is the necessity to manually rewrite documents</li> </ul> <p>Suitable for a low number of documents</p> <p><b>2 days</b> and you can start using EDI</p>
	<h3>E-invoicing</h3>	<ul style="list-style-type: none"> <li>Only invoices</li> <li>Partially integrated with the information system</li> <li>Processing and archiving of invoices in an electronic form</li> <li>Work flow for document approval</li> <li>Trustworthy archiving</li> </ul> <p>Invoice format generated by the information system of a supplier</p> <p><b>E-invoicing service</b></p> <ul style="list-style-type: none"> <li>Conversion to pdf</li> <li>Electronic signature</li> <li>Archiving of the invoice</li> </ul> <p>Email inbox of the buyer</p>
	<h3>EDI</h3>	<ul style="list-style-type: none"> <li>Overall integration with the information system (documents are automatically loaded into ERP)</li> <li>Trustworthy archiving</li> <li>Audit imprint</li> <li>Above standard feedback (notifications about differences etc.)</li> <li>Processes most of documents in a business process</li> </ul> <p><b>ROI</b> 1-3 month</p> <p><b>60%</b> shortening of the time for processing a document</p>
	<h3>EDI 2.0</h3>	<p><b>A complete electronic processing of all documents in a company</b></p> <p>EDI + E-invoicing + Data mailbox + Trustworthy archive + E-catalogue + Monitoring of insolvency register + Instant payment</p>



Legendary solutions you can rely on



# EXAMPLE EDI

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<https://www.edibasics.com/what-is-edi/how-does-edi-work/>

## Information Conveyed in the EDI

**Step 1: Prepare the documents to be sent**

**Step 2: Translate the documents into EDI format**

**Step 3: Connect and Transmit your EDI documents to your business partner**

An EDI 204 transaction set provides detailed pick-up and delivery information for a load, usually for a single pick-up location. This may include some or all of the following:

- Carrier information
- Description of goods, including weight and size
- Expected schedule
- Equipment (truck) requirements
- Shipping instructions
- Contact information and location of the recipient

Transferul electronic de date ( abreviat EDI după en. Electronic Data Interchange ) este o tehnologie care facilitează transferul de date între doi sau mai mulți parteneri de afaceri fără a mai utiliza suportul de hârtie și serviciul de mesagerie. Datele se prezintă sub un format XML și respectă anumite standarde.

Tehnologia EDI este folosită din ce în ce mai des de companii internaționale, în principal datorită avantajelor majore pe care le aduce în colaborarea cu anumite lanțuri internaționale. Anumite companii chiar impun utilizarea EDI de către partenerii lor de afaceri.

Baza procesului de schimb electronic de informații îl reprezintă transferul a diverse documente sau informații între computerele companiilor partenere. Tehnologia EDI înlocuiește practic transmiterea sub formă de fax sau hârtie a diverselor documente rezultate în relația comercială. În transferul de informații se folosesc formate XML, bazate pe standarde acceptate pe scară largă.

Tehnologia EDI este folosită de multe companii din industrii variate datorită eficientizării schimbului de documente operative cu parteneri și furnizori. EDI este cel mai des întâlnit în marile lanțuri de International Key Accounts (IKA). IKA solicită partenerilor și furnizorilor să integreze în relația cu ei sisteme de tip EDI. Documentele standard, care se utilizează în activitatea de zi cu zi în relația cu partenerii pot fi transferate între sisteme informatice diferite, cu minim de intervenție umană, automatizând procese și fluxuri de informație.

Standardizarea și eficientizarea schimburilor comerciale reprezintă o condiție cerută de marile lanțuri de hypermarketuri în relația cu furnizorii. Astfel, procesul de schimb de informații și documente în format electronic vine cu avantaje evidente la nivel de costuri:

- Eliminarea suportului fizic ( hartia )
- Reducerea considerabilă a timpilor de lucru necesari
- Eliminarea erorilor cauzate de manipularea documentelor

De asemenea, tranzacțiile de tip EDI între companii sunt mult mai rapide și mai sigure decât transferul clasic al documentelor.

Viteza de transfer se reflectă astfel în:

- Rotația mai rapidă a stocurilor
- Utilizarea eficientă a spațiilor de depozitare
- Creșterea calității relației cu IKA
- Creșterea performanțelor în raportare
- Acuratețe în preluarea comenzilor și managementul documentelor
- Flexibilitate extinsă în schimbul de informații în timp real

În relațiile comerciale dintre parteneri, tehnologia *EDI* este de obicei integrată cu sistemele informatice de management al afacerilor utilizate de acestia, permițând un control mai amplu al schimburilor de documente cu partenerii.

<https://www.seniorerp.ro/edi-electronic-data-interchange/>

# ERP – ENTREPRISE RESOURCE PLANNING

## Planificarea resurselor întreprinderii

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Istoria sistemelor ERP datează din anii 1960 cand acest tip de aplicație software era folosit cu preponderență pentru asistarea procesului de producție. Primul produs de acest tip a fost MRP (Material Resource Planning).

Deși utile in activitatea de producție, aceste aplicații nu își extindeau funcționalitățile și spre alte zone de interes pentru o întreprindere precum contabilitate, resurse umane, vânzări. Incepand cu anii '90 sistemele ERP au început să ia forma aplicațiilor actuale. Deși dupa apariția MRP funcționalitățile acestui tip de programe au început să se extindă, ERP-ul actual a luat ființă în momentul în care informațiile au putut fi centralizate într-o platformă comună și funcționalitățile sale au fost integrate.

Astăzi, sistemele ERP fac un nou pas in dezvoltarea lor prin utilizarea internetului pentru eficientizarea funcționalităților. Clienții de la mii de kilometri distantă pot avea acces la stadiul propriei comenzi sau la stocurile companiei furnizoare prin integrarea facilităților ERP cu aplicațiile WEB.

Bazându-se pe principiile computerizării web, cloud computing-ul a apărut drept următoarea schimbare de paradigmă în sistemele ERP. În sistem cloud, ERP-ul și datele asociate sunt gestionate centralizat (în "cloud-ul" internetului) de către furnizorul ERP sau de către un terț furnizor de servicii și sunt accesate de client la cerere. Clienții ERP nu trebuie să investească sau să-și actualizeze serverele, sistemele de operare, bazele de date, centrele de date, echipamentele de rezervă sau mediile de programare. Toate datele și aplicațiile relevante sunt stocate și întreținute de la distanță. Mulți dintre furnizorii de ERP tradițional au dezvoltat acum o versiune a software-ului lor pentru utilizarea în cloud. De asemenea, au apărut noi furnizori de ERP și de strategii best of breed care își livrează software-ul numai prin cloud. Unele soluții, cum ar fi CRM, sunt livrate de obicei prin cloud

# FUNCTIONALITATI

[https://www.oracle.com/ro/applications/erp/](https://www.oracle.com/ro/applications/erp/what-is-erp.html)

[what-is-erp.html](https://www.solutiierp.ro)

<https://www.solutiierp.ro>

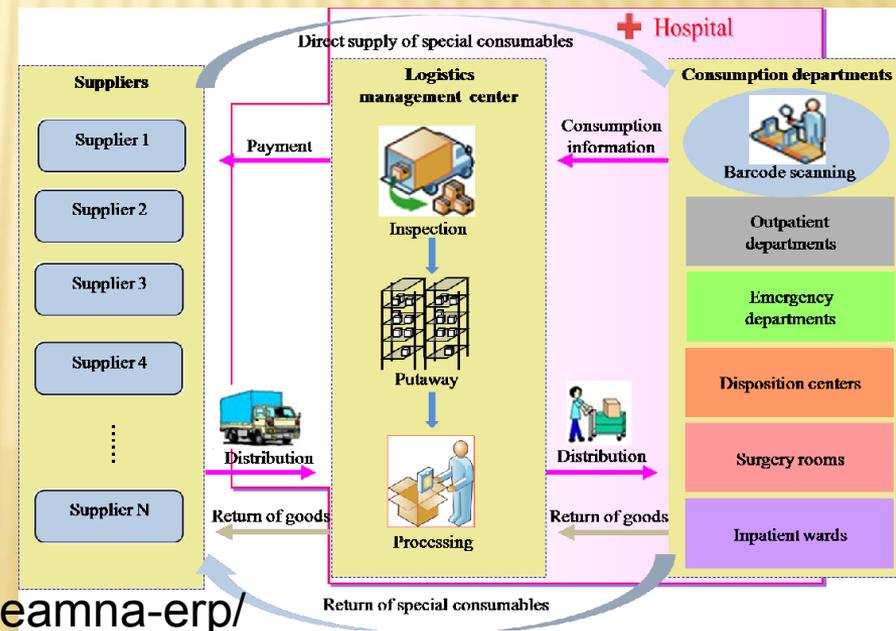
- **Producție**: planificarea și urmărirea producției
- **Gestiune**: evidența stocurilor, a furnizorilor, a plăților și încasarilor
- **Salarii**: calculul salariilor și managementul informațiilor referitoare la personal
- **Contabilitate**: evidența financiar contabilă
- **Imobilizari**: evidența mijloacelor fixe și calculul amortizării
- **CRM**: managementul relațiilor cu clienții
- **BI**: rapoarte, analize, prognoze

**managementul relațiilor cu clienții**

**(CRM), Gestiunea Depozitelor (WMS),**

**Transferurile de Date Electronice (EDI),**

**și chiar sistemele IQM (Intergrated Quality Management)**



BUN: <https://www.seniorsoftware.ro/erp/ce-inseamna-erp/>

# INFORMATION LOGISTICS

Caused by the requirements of worldwide communication and the necessity to rationalize internal processes, efficient concepts for managing the data intensity and data volume have been developed – also, and especially, in logistics.

This is often called information logistics. It must fulfill the following requirements:

- Avoidance of media disruptions (orally – written – electronic data format)
- Reduction of conversion efforts (intervention-free data transmission)
- Avoidance of data redundancies
- Data availability before, during, and after the physical logistics process
- Availability of information when needed, with respect to time and demand
- Linking to existing internal information and communications systems as well as interfaces to the Internet
- Trans-company and trans-national communication standards.

The following outlines the most important developments in open EDI standards:

*ANSI X.12*: Based on standardization efforts begun in the USA in the 1960s, this trans-sector and –function standard was developed from 1978 on, coordinated by the American National Standards Institute ANSI. Today, ANSI X.12 is the most important American EDI protocol standard. It is also available as an EDIFACT subset.<sup>2</sup>

*VDA*: Since 1978, there had been recommendations by the German Automobile Industry Association VDA for the data exchange between automobile manufacturers and the supplying industry which have by now been extended by the data exchange with logistics service providers. Developed by a VDA working group, these recommendations are a sector-specific standard. The documentation is available directly from the VDA as the central coordinator. With this, the automotive industry was a pioneer of the systematical development and application of standards for electronic data exchange.

*ODETTE*: An international sector-specific solution for the automobile industry and their suppliers, ODETTE (Organization for Data Exchange by Tele Transmission in Europe) is a European further development of earlier VDA standards. It has by now been made into an EDIFACT subset as well.

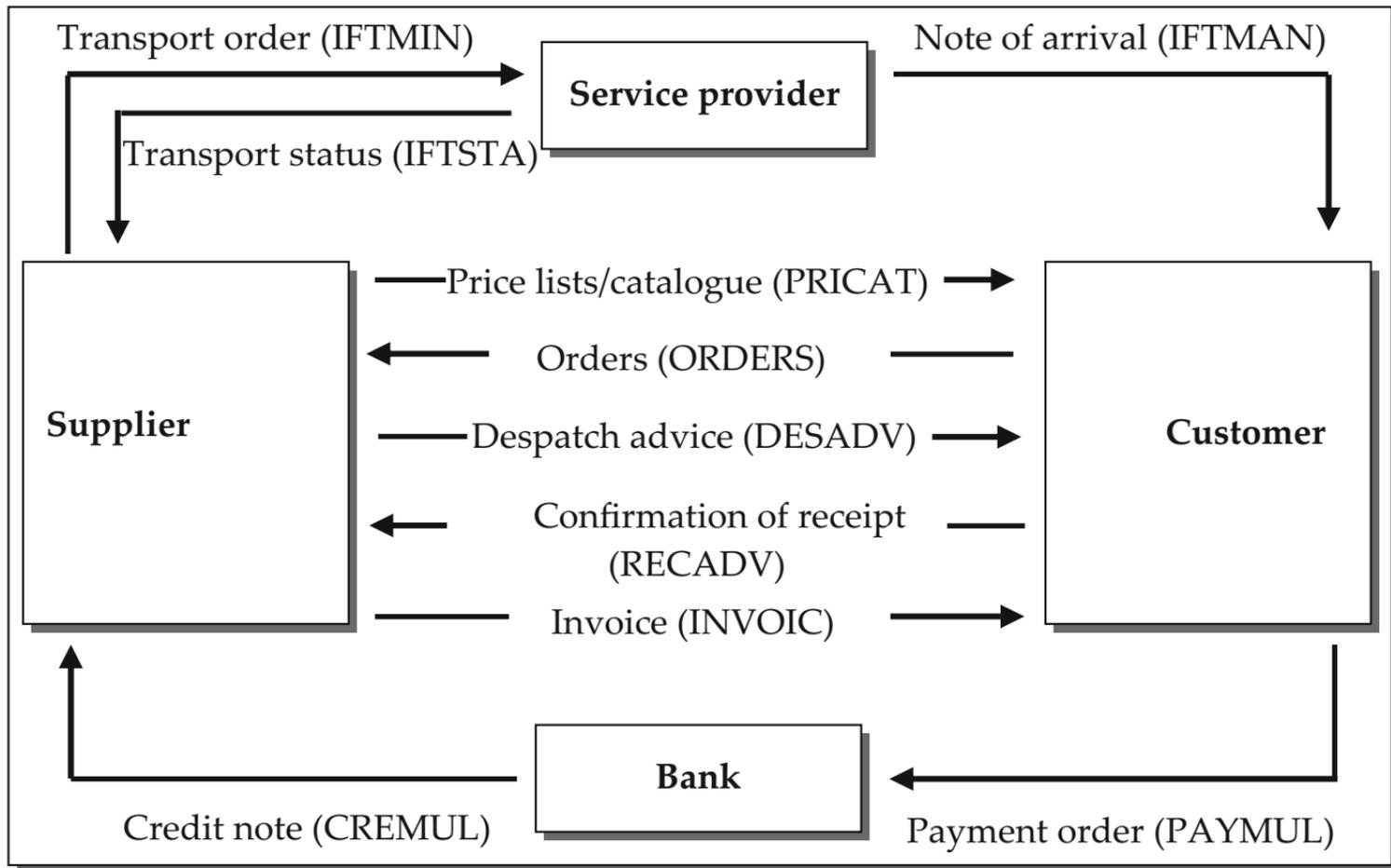
*SEDAS*: SEDAS (*Standardregelungen einheitlicher Datenaustauschsysteme* – Standard Regulations of Uniform Data Exchange Systems) was developed by a German association for rationalization, GS1.<sup>3</sup> It was the first national protocol standard for data exchange in consumer goods trading, including the manufacturers. Orders, invoices, market research data, as well as reference data like product and customer information are to be transmitted using the SEDAS format. However, national sector-specific standards are limitations, so despite its widespread use, SEDAS will successively be replaced by EANCOM®.

*EDIFACT*: To eliminate basic limitations by national or sector-specific standards, the United Nations' Economic Commission for Europe (UN/ECE) began to

<sup>3</sup> GS1 (formerly CCG) is a German rationalization association in Cologne, provided equally by institutions of trade and industry. The best known regulations created under coordination of GS1 are agreements concerning international numeral systems (e.g. EAN and corresponding barcodes), electronic data exchange as described above (e.g. SEDAS, EANCOM) or, in logistics, multi-way transport systems and pallets. For some time now, activities have been focused on the development of EPC (Electronic Product Code) for use in the field of RFID. Furthermore, GS1 has been supporting ECR (Efficient Consumer Response) and CPFR (Collaborative Planning, Forecasting and Replenishment) concepts.

**Table 9.1** EDIFACT message types and their areas of use

<b>Trade/ industry</b>	Inquiry, offer, order change, order confirmation, order, just-in-time delivery, account statement, delivery schedule, despatch advice, partner reference data, price catalogue, invoice
<b>Transport</b>	Note of receipt, booking request, booking confirmation, fixed booking, forwarding and transport message frame, loading list, transport/forwarding order, transport data reporting/status report
<b>Customs</b>	Debit note, expanded credit note, expended payment order, credit note, payment order, payment advice
<b>Banks</b>	Customs duties, customs declaration, customs notice
<b>Insurances</b>	Open account, reinsurance



**Fig. 9.2** Information flow in logistics with EANCOM® standards  
(Cf. GS1 Germany (2006a), p. 7)

## 9.1.2 Identification Standards

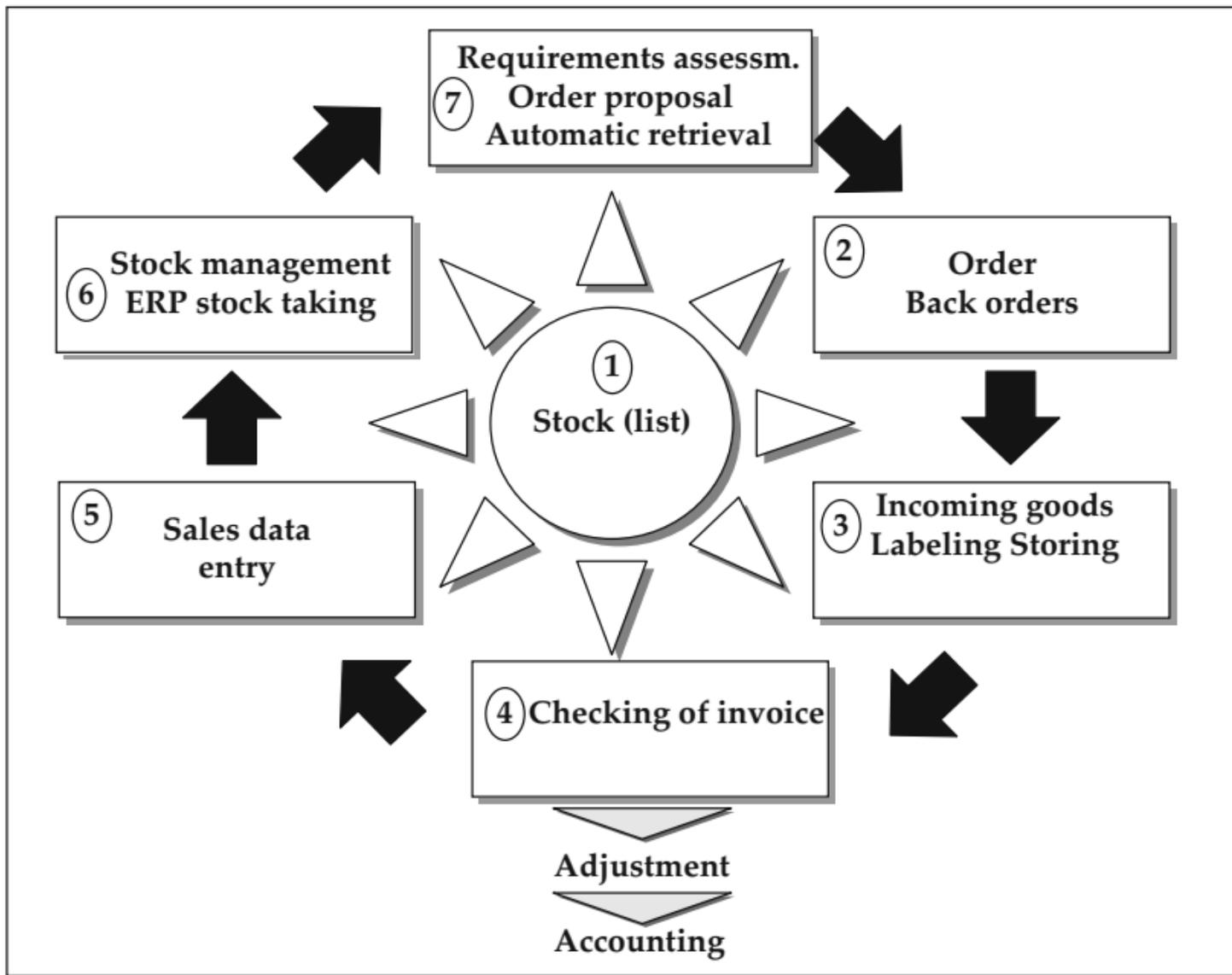
Besides standardizing the communication between business partners, standardizing identification systems is also important. This standardization is necessary to connect the information flow to the physical flow of goods. This connection is seen as a labeling of the goods and transport units that can be read by all parties involved in the process chain. The most common identification standards will be explained in the following.

The *Global Location Number* (GLN) makes possible the identification of companies or company departments. This manufacturer number is a part of the EAN number and is assigned centrally by the national standardization organization.

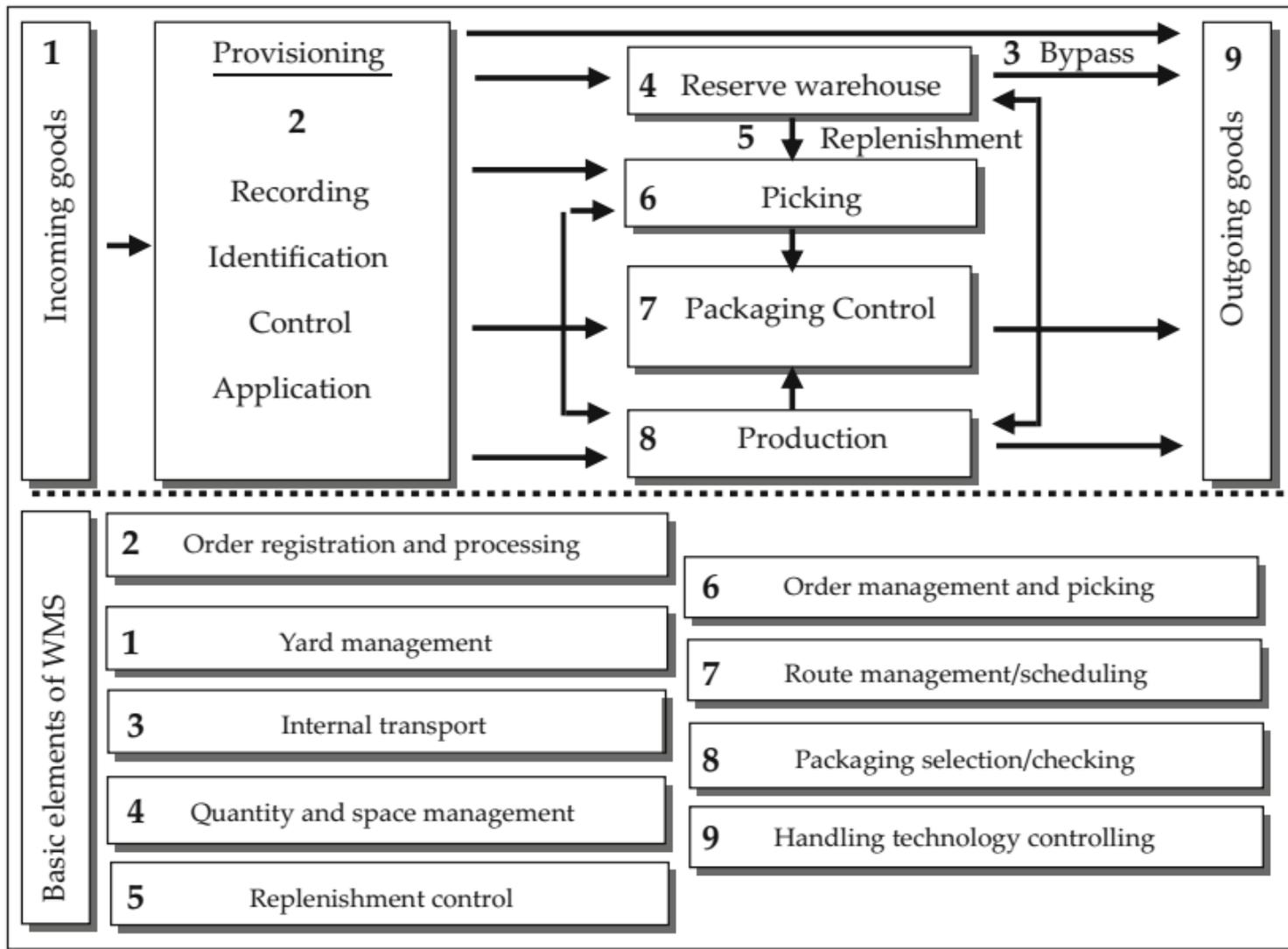
The *Global Trade Item Number* (GTIN) enables the clear and global identification of products, sales and trade units as well as services. The number usually has 13 digits and describes the product and its specifications like color, size, weight, packaging unit etc. It consists of a base number identifying the manufacturer, an individual item number, and one check digit. The GTIN number is the key to access reference data (designation, weight, volume, class of goods etc.) in databases or the price of the article. The manufacturer assigns the item number. Case study 8.1 shows the fundamental data transfer upon scanning a GTIN number as a barcode at the till.

With the space for a 13-digit number not available on small products, there is also a shorter, 8-digit, GTIN number for such cases.

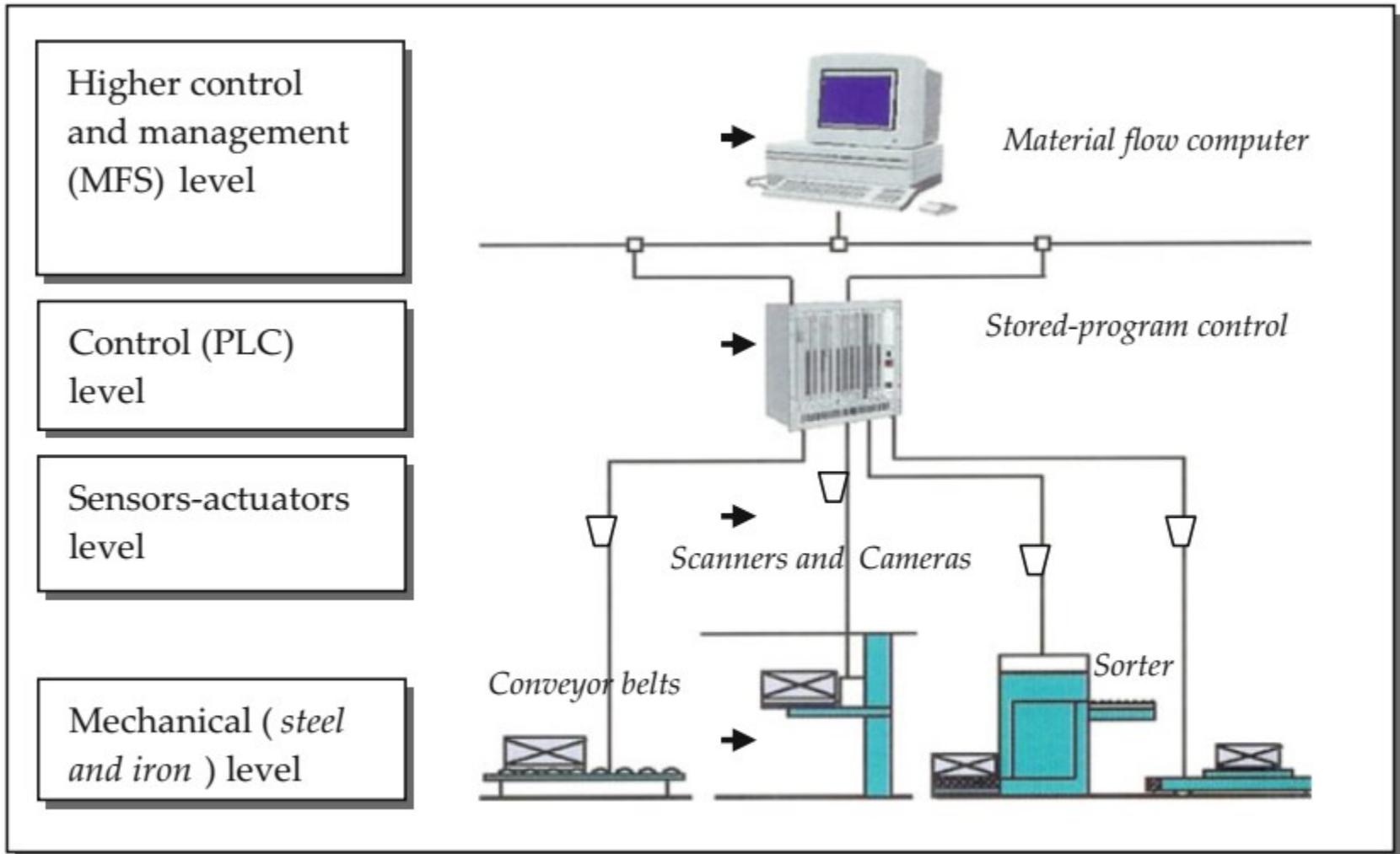
In North America, the 12-digit UPC (Universal Product Code) is used. It is fully compatible with the GTIN number.



**Fig. 9.13** Cycle of a closed ERP system (Cf. Hertel et al. (2005), p. 225)



**Fig. 9.15** Process-oriented view on warehouse management systems  
(Cf. Bode and Preuß (2004), p. 325)



**Fig. 9.16** IT structure in the warehouse (Cf. Caninenberg (2004), p. 34)

# SAP NetWeaver™

## PEOPLE INTEGRATION

Multi channel access

Portal

Collaboration

## INFORMATION INTEGRATION

Bus. Intelligence

Knowledge Mgmt

Master Data Mgmt

## PROCESS INTEGRATION

Integration  
Broker

Business  
Process Mgmt

## APPLICATION PLATFORM

J2EE

ABAP

DB and OS Abstraction

Composite Application Framework

Life Cycle Mgmt

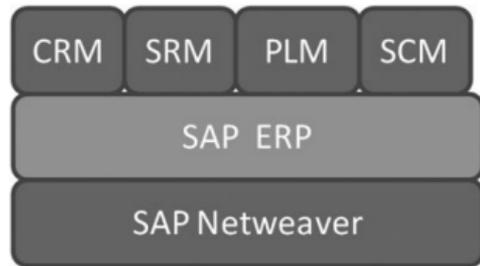


WebSphere®

Microsoft  
.net

# Overview of an SAP ERP Solution

Now, let's explore the most exciting solution offerings from SAP. SAP Business Suite is the solution bundle provided by SAP AG for all of your business requirements. You will find that SAP Netweaver provides a platform to host the entire business suite. As a customer, you have a choice to procure it as an entire solution bundle and/or individual solution. Figure 1-6 illustrates the SAP Business Suite.



**Figure 1-6.** The SAP Business Suite

The SAP Business suite consists of:

1. SAP ERP
2. SAP Customer Relationship Management (CRM)
3. SAP Supplier Relationship Management (SRM)
4. SAP Product Lifecycle Management (PLM)
5. SAP Supply Chain Management (SCM)

As referred in Figure 1-6 SAP Netweaver is the base technical layer hosting it all. The SAP ERP is the core component, which maps the business process. You'll be able to map operative business process across departments.

The core SAP ERP solution contains the following applications:

1. SAP ERP Financials for accounting
2. SAP ERP Human Capital Management for human resources
3. Logistics, comprised of:
  - a. SAP ERP Operations
  - b. SAP ERP Corporate Services

**Table 1-1.** SAP ERP Modules

Application	Function	Acronym
Accounting	Financial Accounting	FI
	Controlling	CO
	Financial Supply Chain Management	FISCM
	Treasury	TR
	Enterprise Controlling	EC
	Project System	PS
Human Resources (HCM)	Personnel Administration	PA
	Recruitment	PR
	Personnel Development	PD
	Payroll	PY
	Event Management	EM
	Organization Management	OM
	Time Management	TM
	Travel Management	TM
	Logistics	Purchasing
Production Planning & Control		PP
Sales & Distribution		SD
Customer Service		CS
Warehouse Management		WM
Transportation & Distribution		LE
Quality Management		QM
Real Estate Management		RE
Plant Maintenance		PM
Environment, Health & Safety		EHS

# Model B2C si B2B

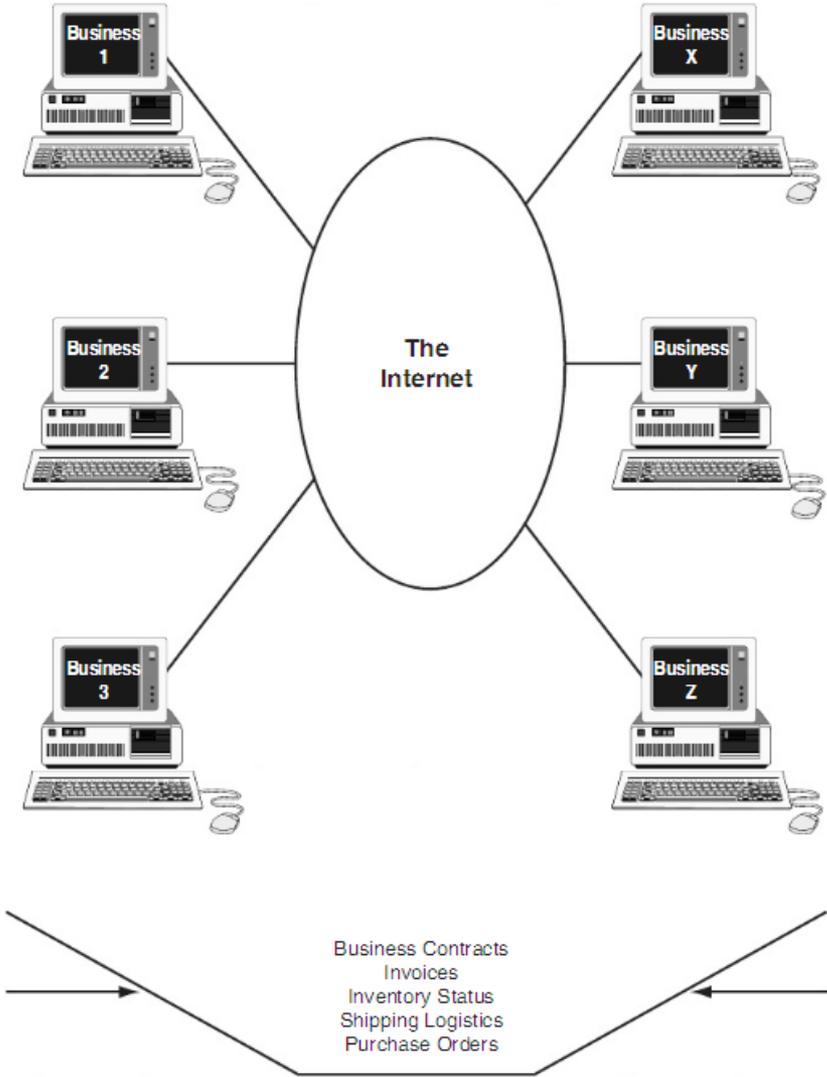
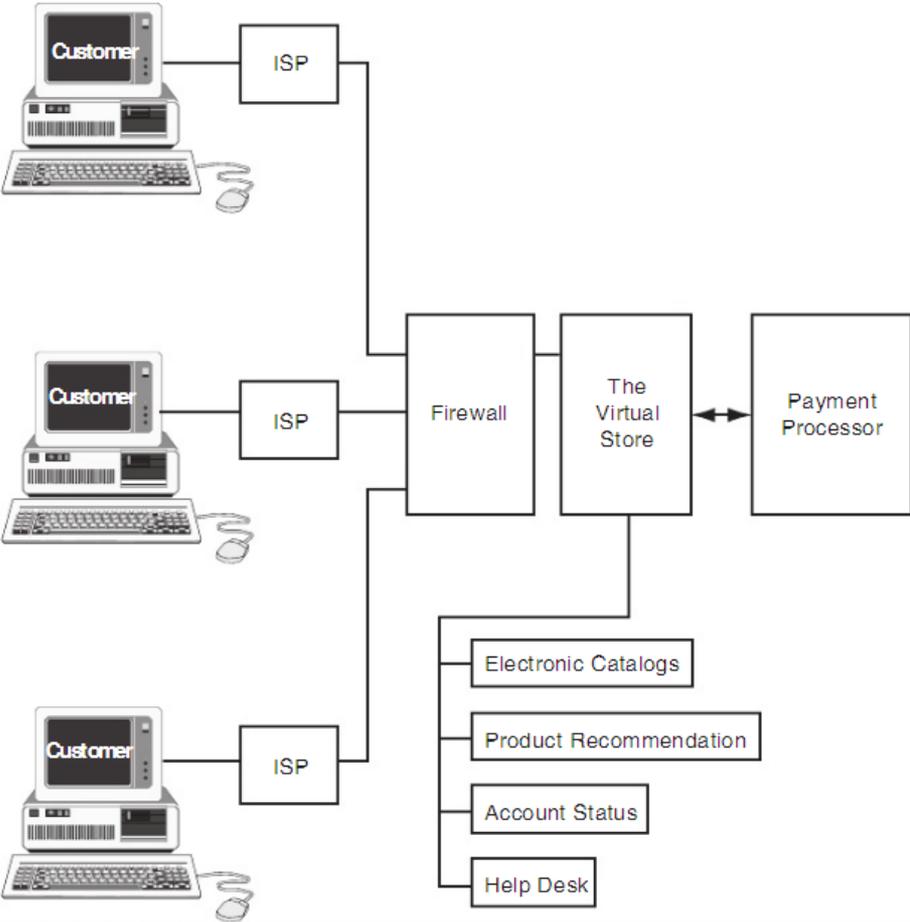


Figure 2-2 A generic business-to-business (B2B) e-commerce configuration.

# Operatii B2C

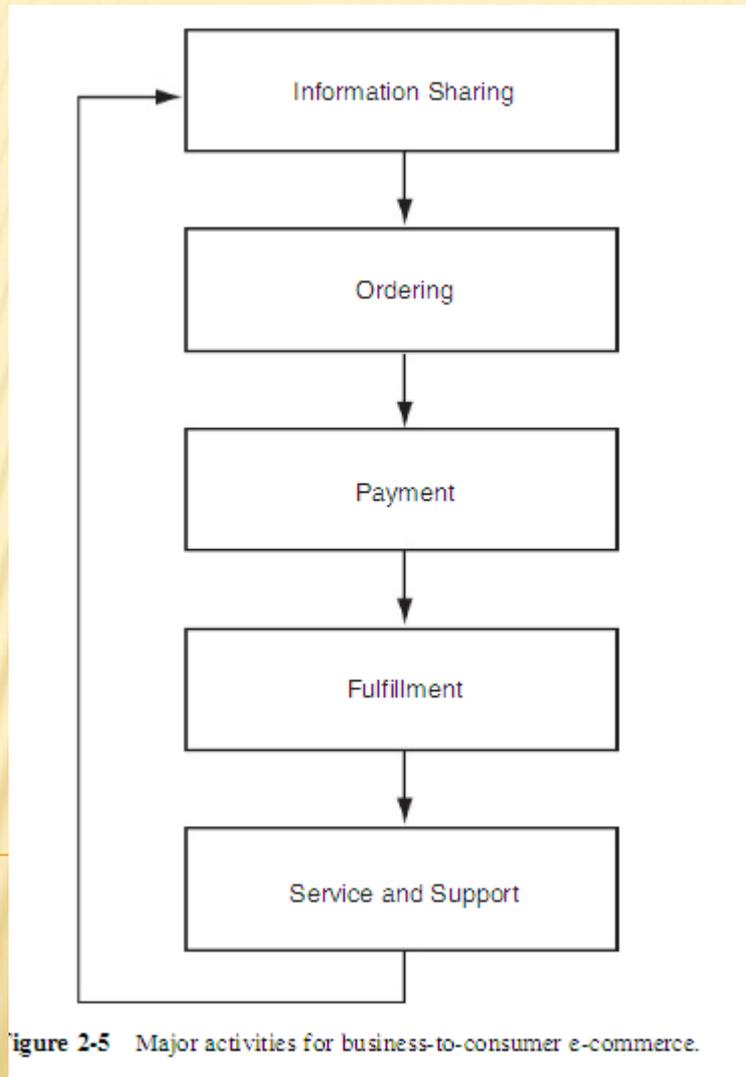


Figure 2-5 Major activities for business-to-consumer e-commerce.

# Avantaje si dezavantaje

## Selected Possible Advantages of E-Commerce

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Doing business around the globe 7 days a week, 24 hours a day  
Gaining additional knowledge about potential customers  
Improved customer involvement  
Improved customer service  
Improved relationships with suppliers  
Improved relationships with the financial community  
Increased flexibility and ease of shopping  
Increased number of customers  
Increased return on capital and investment, since no inventory is needed  
Personalized service  
Product and service customization

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Table 2-3

## Some Disadvantages of E-Commerce

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Possible capacity and bandwidth problems  
Security issues  
Accessibility (not everybody is connected to the Web yet)  
Acceptance (not everybody accepts this technology)  
A lack of understanding of business strategy and goals

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## Advantages of Business-to-Business E-Commerce

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Lower production cost  
More timely information  
Increased accuracy  
Improved cycle time  
Increased communications  
Improved inventory management

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# Model intranet

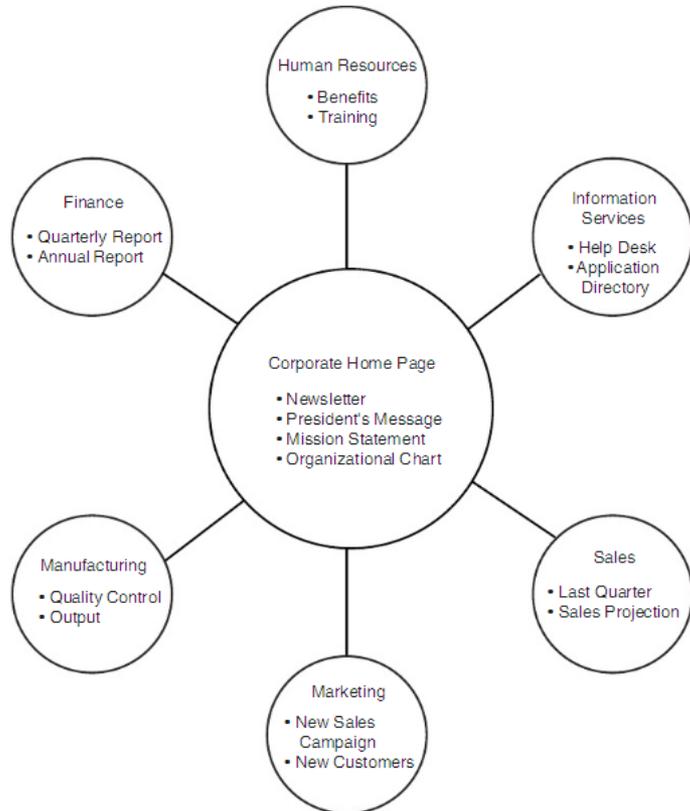


Figure 4-2 An organization intranet structure.

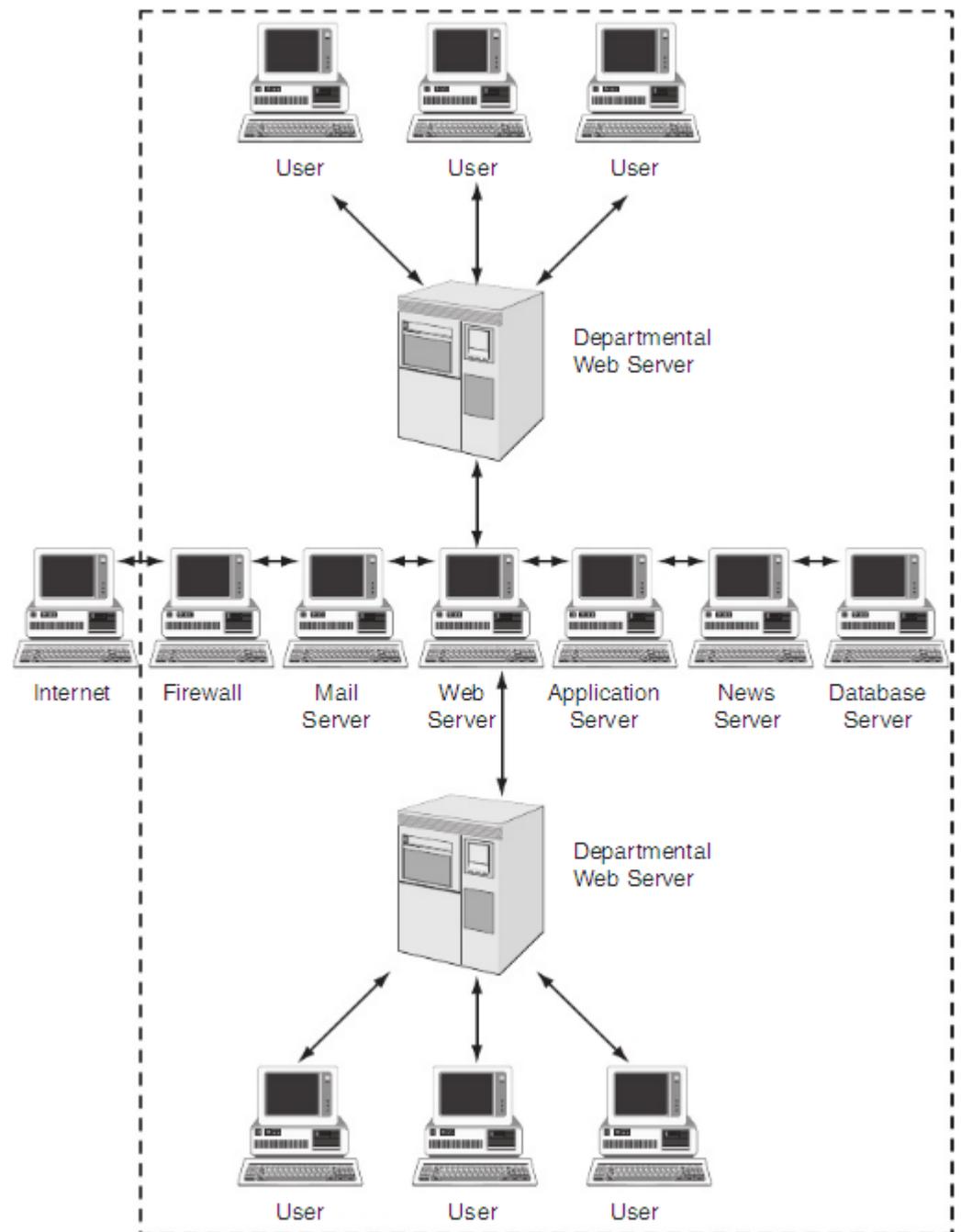


Figure 4-1 A simple intranet configuration.

# Informatii disponibile prin intranet

## Possible Information Provided by the Intranet

	New product offerings
Budget planning	Newscast on demand to desktop, custom filtered to client profile
Calendar events	Online training
Call tracking	Order placement
Company mission statement and policies	Order tracking
Competition data regarding the latest actions taken by the competitors	Organizational charts
Contest results	Patient treatment sign-off
Customer information	Personnel policy
Department information	Press releases
Employee classified	Product catalog
Employee stock options	Project information
Equipment inventory	Salary ranges
Expense report	Sales tips
Facilities management	Software program tutorials
Industry news	Suggestion box
Job postings	Telephone listings
Job descriptions	Time cards
Leave of absence and sabbatical news	Training manuals
Maps	Training schedules
Medical benefits	Travel authorization
Meeting minutes	Upcoming functions
New hire orientation materials	

# Model Extranet

✘ Conexiune securizata pentru accesul la informatii despre/pentru partenerii de afaceri:

- + Clientii
- + Vanzatorii
- + Furnizorii
- + Consultantii
- + Distribuitorii
- + Resellers
- + Exemplu – urmarirea unei comenzi livrate pe baza codului comenzii – transparenta doar pentru client

Comparison of the Internet, Intranet, and Extranet

	Internet	Intranet	Extranet
Access	Public	Private	Private
Information	Fragmented	Proprietary	Shared by close business partners
Users	Everybody	Members of an organization	Groups of closely related companies

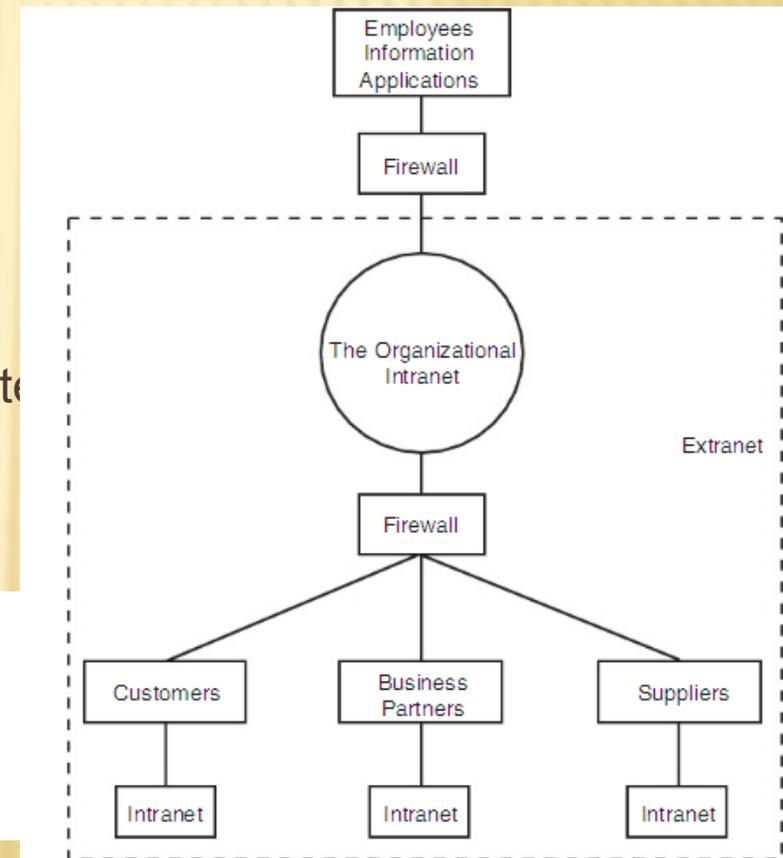
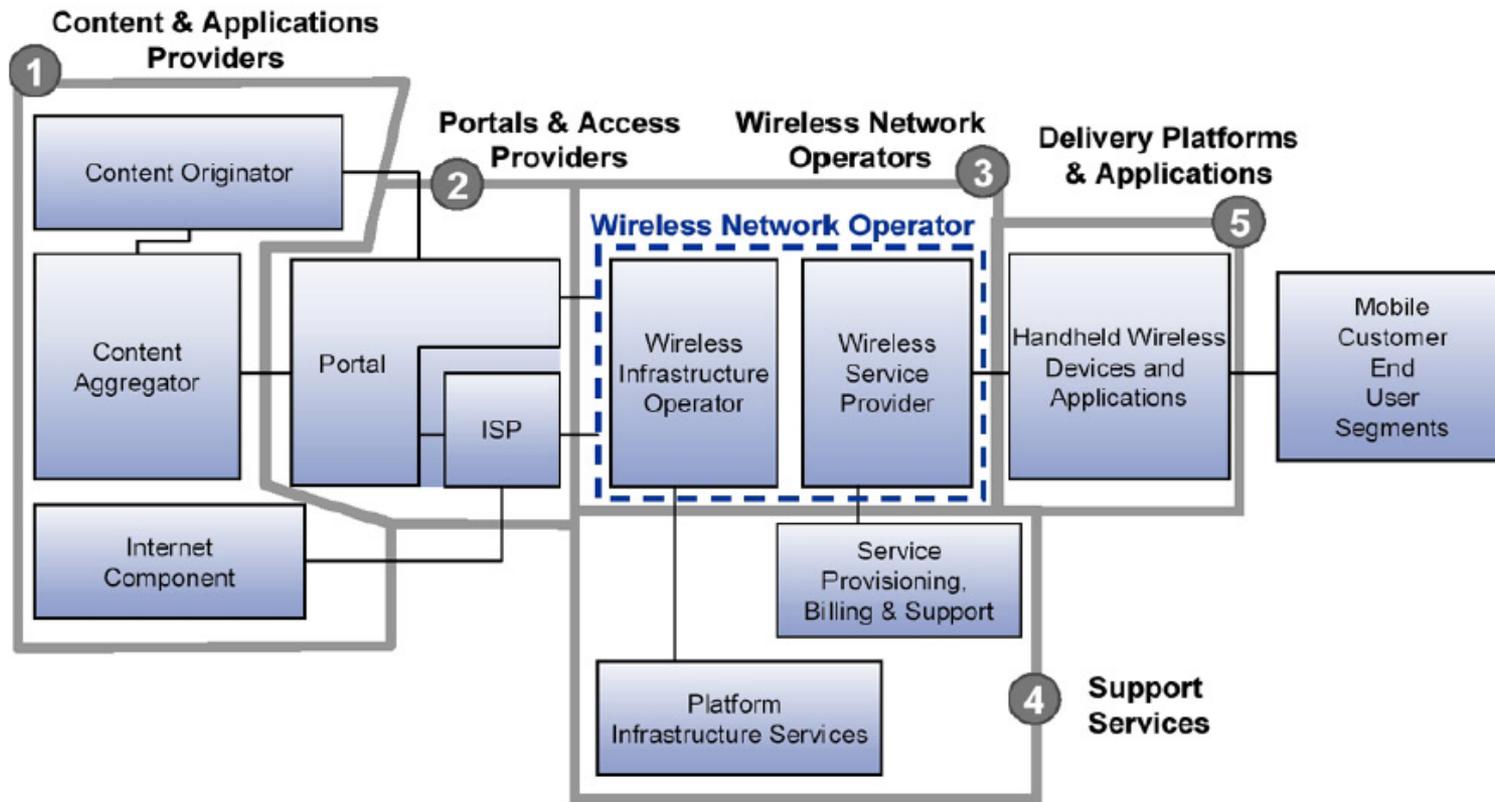


Figure 4-3 A typical extranet configuration.

# Model comunicatii mobile



# E-Logistics

- ✘ Include e-commerce – in stransa legatura cu activitatile de vanzare, depozitare, aprovizionare (link util - <http://www.scribd.com/doc/6822967/Electronic-Commerce-Principles-and-Practice-0120959771>)
- ✘ Include informatii despre – nivelul stocurilor (ex. Senzori), inventariere (pe baza codului de bare), transport (RFID, GPS), statistici de analiza a eficientei modelului logistic - Inventory Control Basics, RFID Supply Chain Planning Levels
- ✘ Reducere costuri operationale prin folosire RFID – Modern execution systems such as warehouse management systems (WMS) and transportation management systems (TMS) and related execution modules in enterprise resource systems (ERP)
- ✘ Generatii RFID - high-frequency (HF) 13.56 passive tag is used to track retail over-the-counter drugs at the item level, ultra-high-frequency (UHF) 915-MHz passive RFID tags can be used to track inventory at the case- and pallet-level inventory, and UHF 303-MHz active tags track the status of inventory on tractor trailers (Generations 1 and 2 UHF 856–915 MHz passive tags)

### ***B2C/C2C m-transactions***

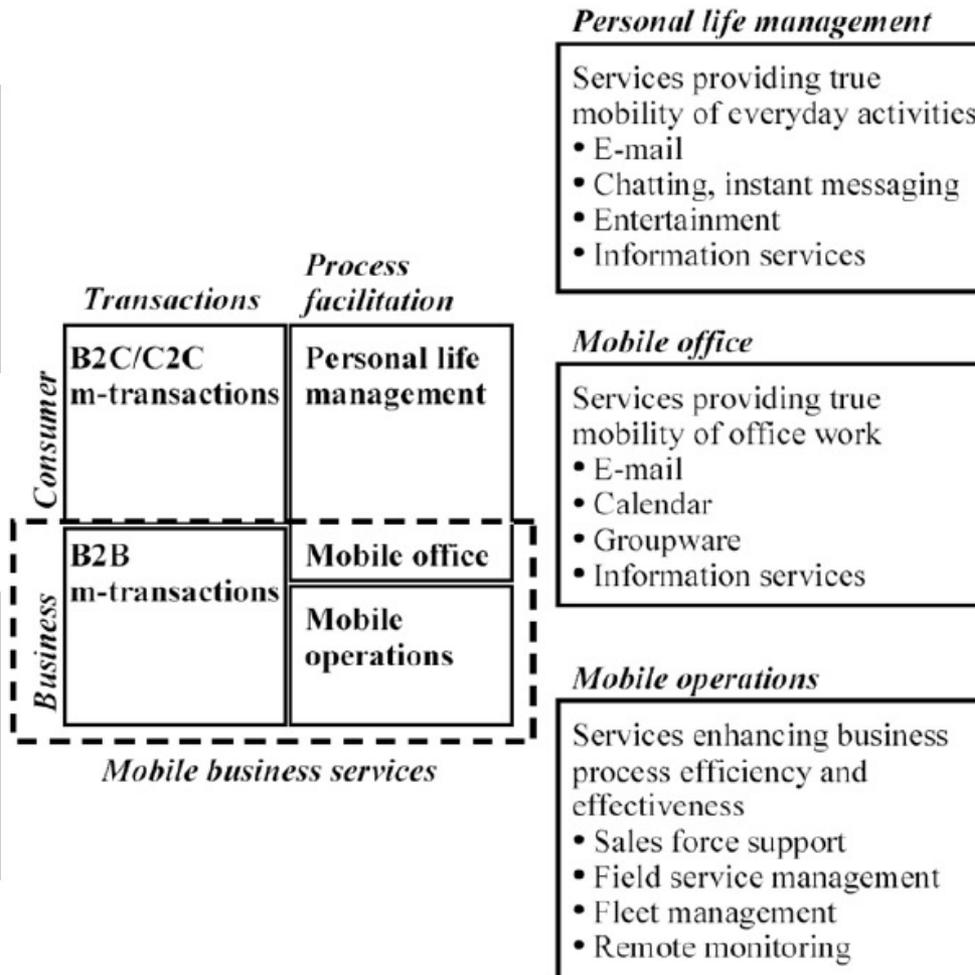
Services aimed at consumers to do mobile transactions

- Stock trading
- Mobile banking
- Location based advertising
- M-tailing
- M-wallet

### ***B2B m-transactions***

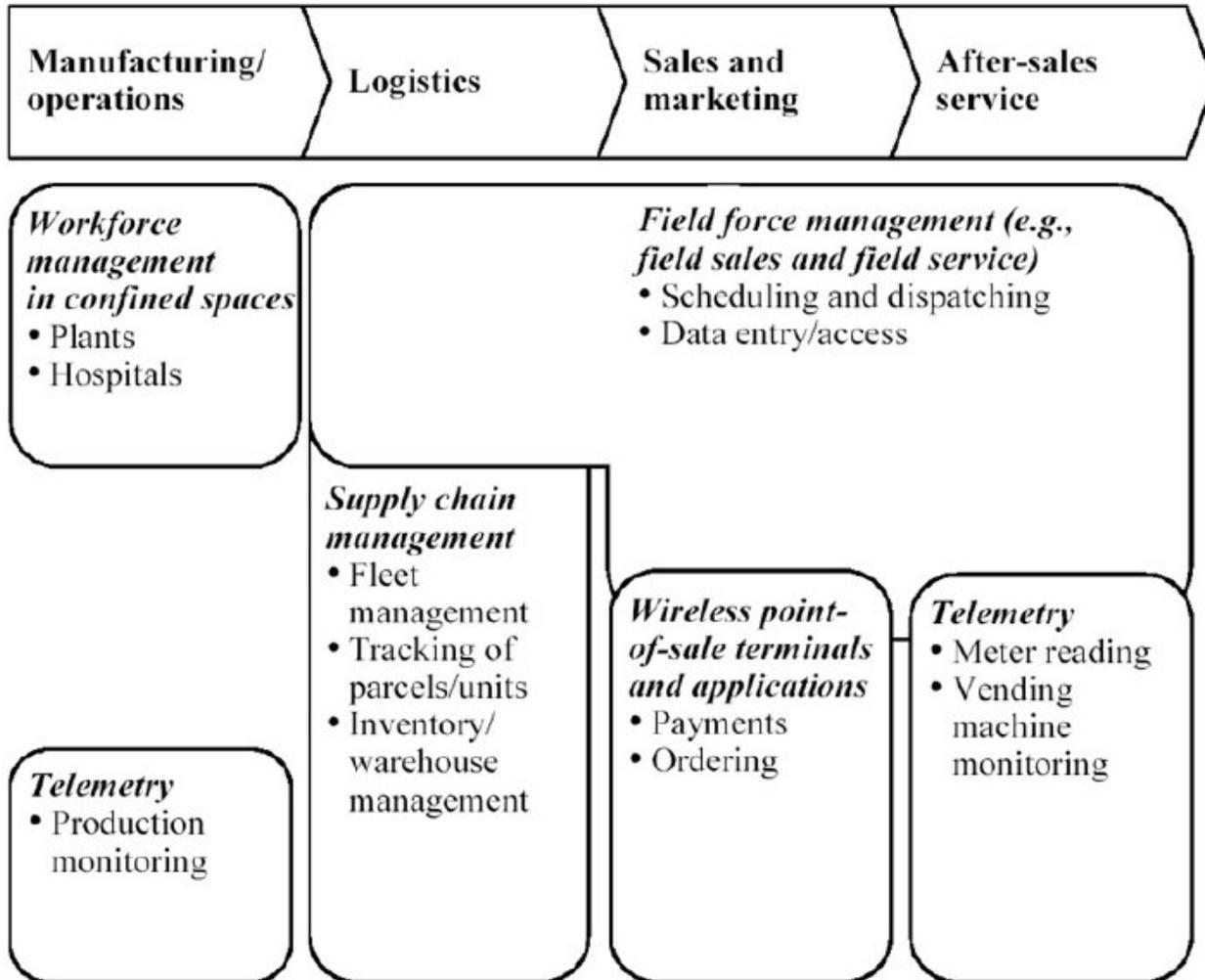
Services aimed at businesses to do B2B m-transactions

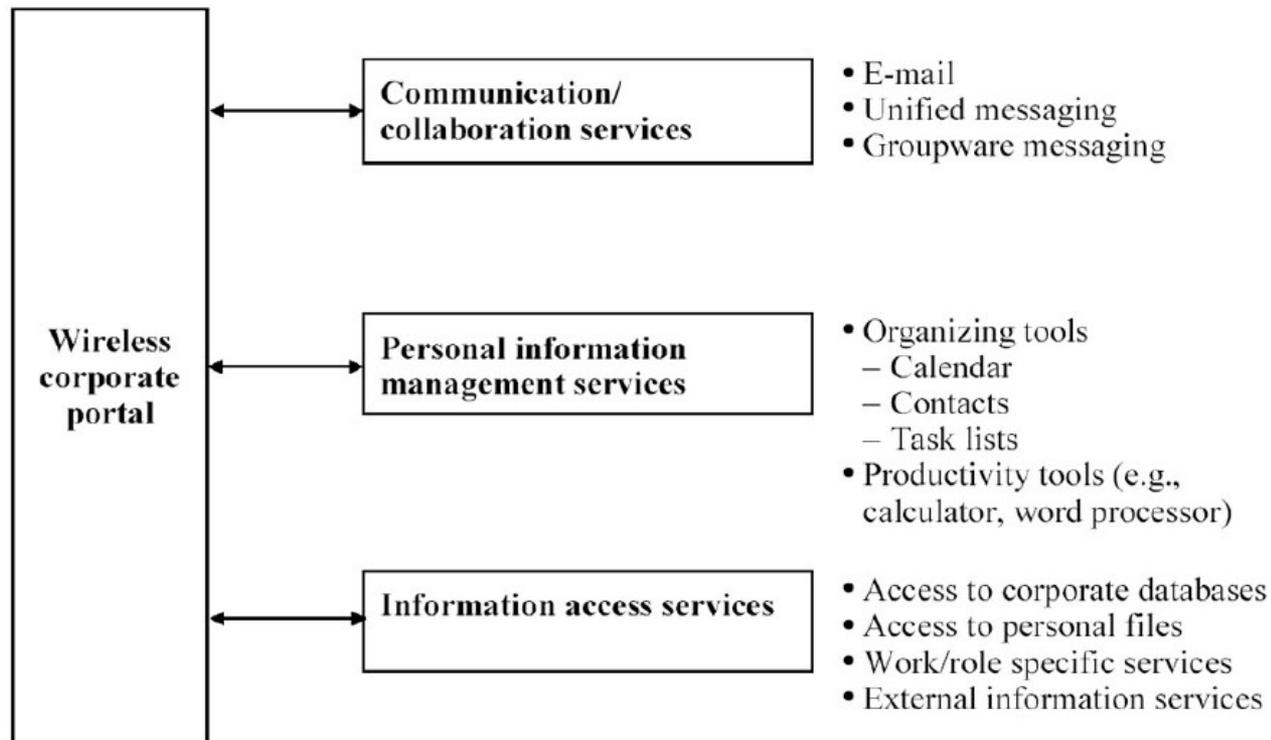
- Access to B2B e-commerce marketplaces
- Access to bilateral online trading systems
- Banking services



Source: McKinsey research

**Flow of communication**





- Enabling service platform, e.g.,
  - Access and authentication
  - Content format and protocol translation
  - Service administration

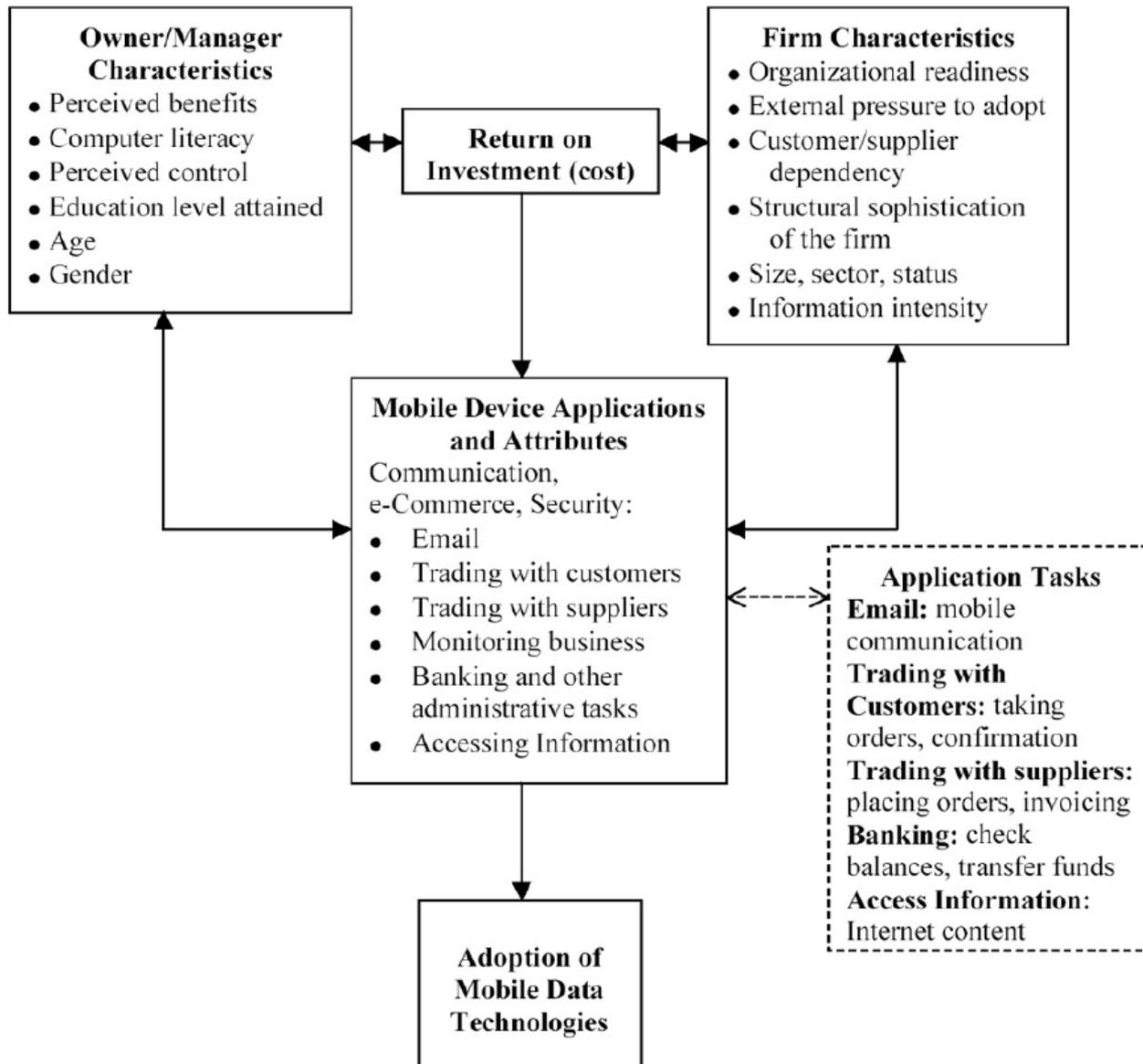


Figure 2: Factors Impacting Small Business Adoption of Mobile Data Technologies

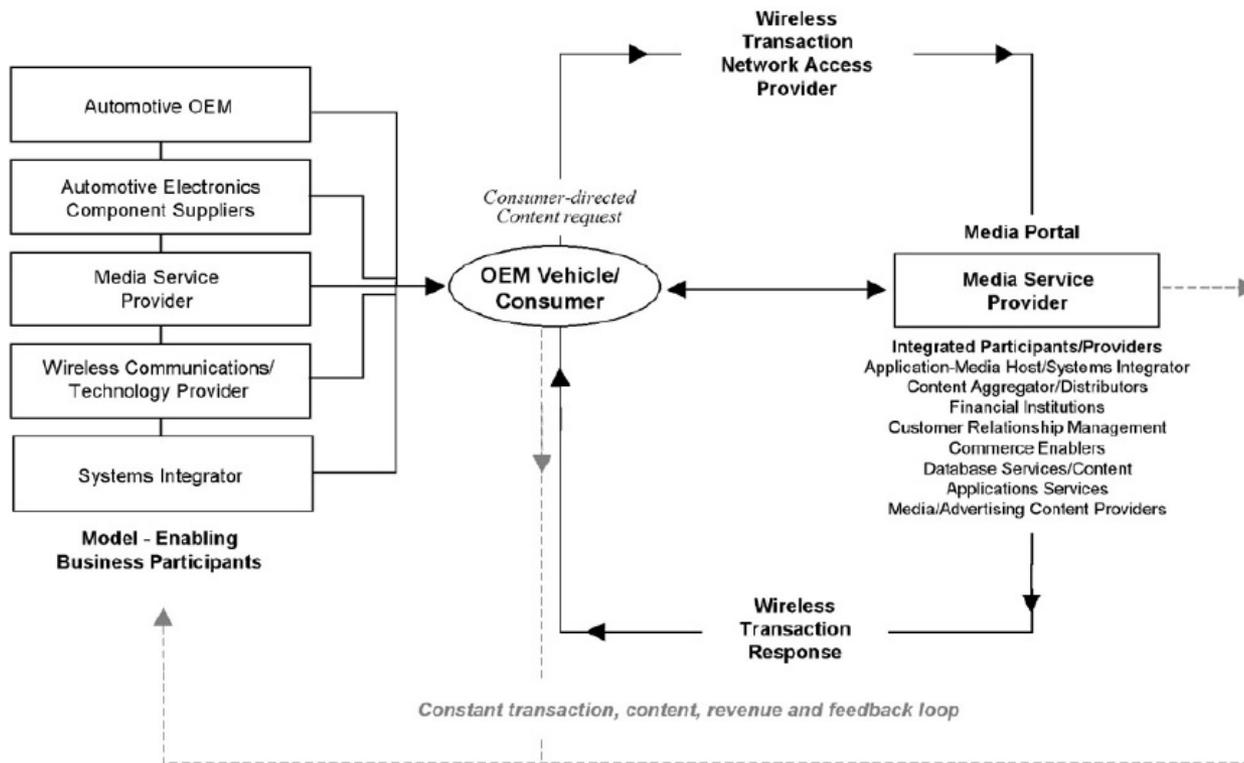


Figure 2: Illustration of how several satellite, electronic and automotive component suppliers work to satisfy a consumer-related content request