
Transaction Processing, Functional Applications & Integration

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Alternatif Pengganti

- Tgl 19 nov jam 10.30 (Sabtu)
 - Tgl 3 des jam 10.30 (Sabtu)
 - Tgl 5 des jam 10.30 (Senin)
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Functional Areas in a Business

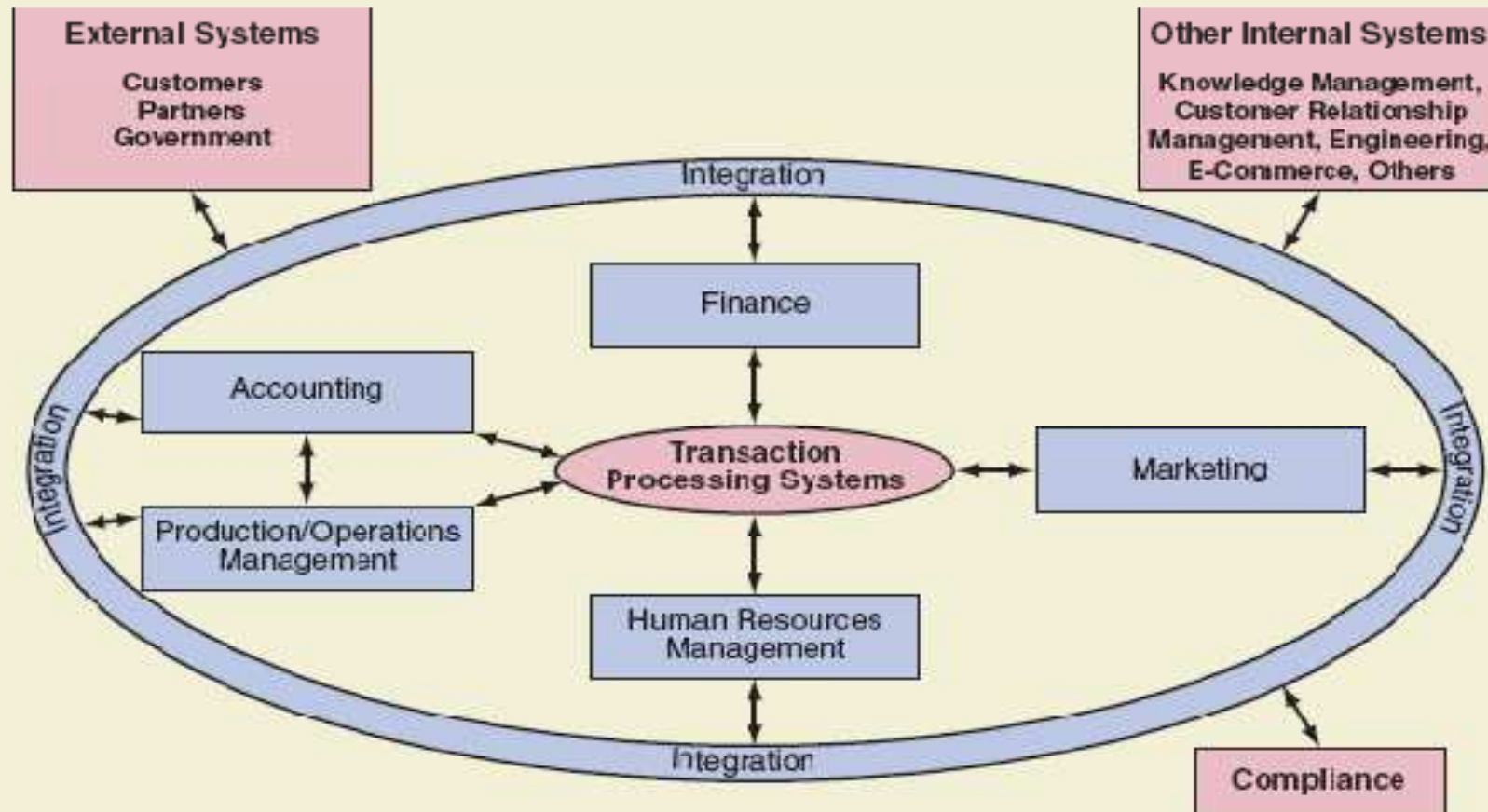


Figure 7.1 The functional areas, TPS, and integration connection. Note the flow of information from the TPS to the functional systems. Flow of information between and among functional systems is done via the integration component.

Kebutuhan Functional Information System

- Functional IS yg utama: produksi/operasional, marketing, human resource, accounting, dan financial.
 - Contoh: customer membeli barang secara kredit, ketika **order** itu sampai di **marketing/sales**, kredit tersebut harus di approve oleh **finance**.
 - Bagian **produksi** mengecek barang itu di **warehouse**, jika ada, maka bagian packing akan melakukan **shipping**.
 - Bagian **accounting** mempersiapkan nota, bagian **finance** mempersiapkan asuransi.
 - Jika IT tidak sinkron dan cepat => customer service menjadi jelek
 - Dibutuhkan integrated approach
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Functional Information System

Characteristics

- Composed of **smaller** systems
 - Terdiri dari beberapa IS yang mendukung aktivitas tertentu (misal: bagian Penjualan dan Akuntansi)
 - Bersifat **integrated** atau **independent**
 - **Interfacing**
 - FIS mungkin akan berinteraksi dengan sistem dari **pihak luar** organisasi
 - Cth: HR dapat mengumpulkan data tentang pasar tenaga kerja
 - Supportive of **different** level
 - Operational: kegiatan transaksional,
 - Managerial: keputusan jangka pendek,
 - Strategic: keputusan jangka panjang
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Transaction Processing Information Systems



TPS monitors, collects, stores, processes, & disseminates information for all routine core business transactions.

Characteristics of Transaction Processing Systems:

| | |
|--------------------------|---|
| Rapid Processing | Processes transactions virtually instantly |
| Reliability | Ensures transactions never slip past the net, & systems themselves are operational permanently |
| Standardization | Acquires standard data for each transaction |
| Controlled Access | Access is restricted to only those employees who require their use |

Transaction Processing Information System

- Transaksi **pasti** terjadi pada setiap organisasi:
 - Untuk memproduksi mainan, maka perlu order material dan spare parts, membayar tenaga kerja dan listrik, membuat order pengiriman barang, dan nota untuk konsumen.
 - Bank juga mencatat akun kita, dll
 - Setiap transaksi **pasti** menghasilkan transaksi lainnya (tambahan)
 - pembelian akan mempengaruhi bagian inventory (gudang),
 - membayar gaji akan mengurangi kas (akuntansi)
 - Transaksi perlu dikomputerisasi
 - Untuk meminimalisasi kesalahan
 - Tujuan **TP IS** adalah menyediakan semua data yg dibutuhkan oleh bisnis proses perusahaan
 - Handle high volume transaction, avoid errors, avoid downtime, never lose results, maintain privacy dan security
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Characteristics TPS

- **Large** volume of data are processed
 - Source data is mostly **internal**
 - TPS processes information in regular: daily, weekly, biweekly, etc
 - TPS monitors & collects **current** or **past** data
 - Input & output data are **structured**
 - A high level of **detail**
 - **Low** computation complexity
 - Accuracy, data integrity, and security are needed
 - High reliability
 - Inquiry processing from database (in real time)
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TPS activities and methods

- TPS activities occurs in two ways:
 - **Batch** processing: transaksi disimpan dan diproses di akhir periode
 - **Online** processing: transaksi disimpan dan diproses secara real time (as soon as transaction occurs)
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TPS – In-flight Card Payments



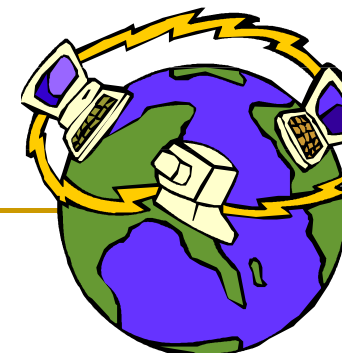
Many airlines now accepting plastic for in-flight purchases



Many airlines go cashless for in-flight purchases

TPS – Online Transaction Processing Systems

- With **OLTP** and Web technologies such as an extranet, **suppliers** can look at the **firm's inventory level** or **production schedule** in real time.
 - The suppliers themselves, in partnership with their customers, can then assume responsibility for inventory management and ordering.
- **Interactive Internet TPS** expands OLTP to provide enhanced **real time transaction processing over the Internet or intranets**.



Typical OLTP Environments

- Airline/ Railway Reservation Systems
 - Banking Systems (ATM, EFT, ...)
 - Trading and Brokerage Systems
 - Hotel / Hospital Systems
 - Reservation systems: set aside service/product for future use
 - Point-of-sale (POS) terminals: sells goods/services
 - Library loan systems: keeps track of items borrowed from library
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ACID Property of Transactions

- **Atomicity:** Either all updates are performed or none
 - **Consistency:** If the database state at the start of a transaction is consistent, it will be consistent at the end of the transaction
 - **Isolation:** When multiple transactions are executed concurrently, the net effect is as though each transaction has executed in isolation
 - **Durability:** After a transaction completes (commits), its changes are persistent
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Atomicity

Consider the case of funds transfer from account A to account B.

A.bal -= amount;
B.bal += amount;

A.bal -= amount;

CRASH

...

...

RECOVERY

A.bal += amount;

Rollback



Consistency

Consider the case of funds transfer from account A to account B.

A.bal -= amount;

B.bal += amount;

B.bal += amount;

A.bal -= amount (**FAILS!!**)

Rollback

B.bal -= amount;

Isolation

Consider the case of funds transfer from account A to account B.

Transaction T1:

A.bal -= amount;

B.bal += amount;

Transaction T2:

A.bal -= amount2;

Transactions execute **independently** of one another.

In other words, the partial effects of an incomplete transaction *should not be visible to other transactions.*

Durability

Consider the case of funds transfer from account A to account B.

Account A should have a balance of *amount*

Transaction T1:

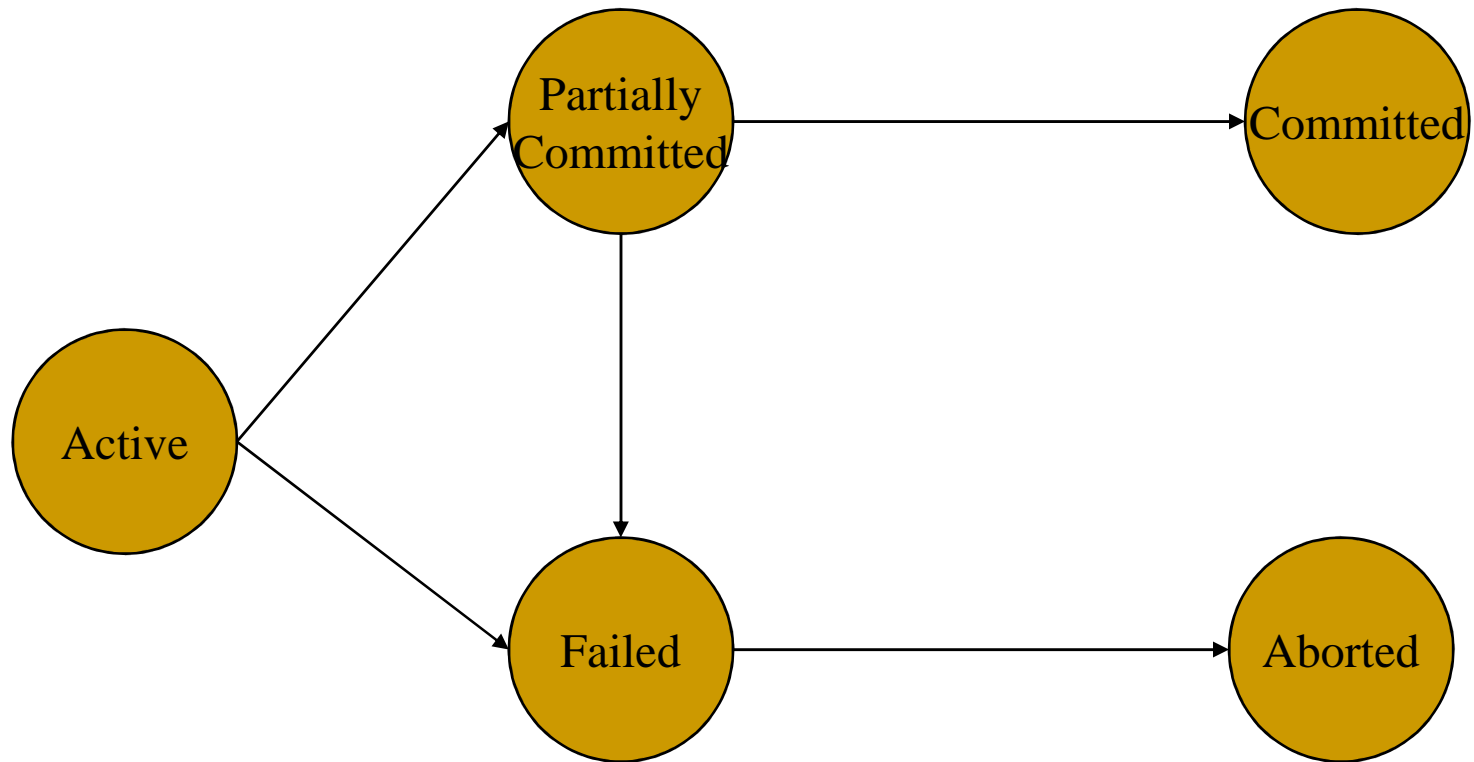
A.bal -= amount;

B.bal += amount;

Commit

Account A must be balance.

Transaction States



Transaction

A transaction can have one of two outcomes:

- If it completes successfully, the transaction is said to have **committed** and the database reaches a new consistent state.
 - If it does not execute successfully, the transaction is **aborted**.
 - This is known as **roll-back**.
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TPS activities

- Posting General Ledger (Buku Besar)
 - Accounts payable dan receivable
 - Receiving and shipping
 - Inventory
 - Fixed assets management
 - Payroll
 - Report to government
 - Personal files and skills inventory
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Batch

- each transaction part of a **group**
 - database is not accessible **all** of the time
 - more errors
 - data is organised and stored before master file is updated – errors can occur during these steps
 - **easier** to maintain than real-time
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Real-time / Online

- each transaction is **unique**
 - requires master file to be available more often for updating
 - fewer errors – transaction data is validated and entered immediately
 - infrequent errors may occur – but often tolerated
 - not practical to shut down whole system (infrequent errors)
 - more computer operators are required in real-time processing – operations not centralised
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Examples of batch transaction processing

- Cheque clearance: written order asking bank to pay money to a person
- Bill generation: an invoice for goods/services supplied to a customer.
- Credit card sales transaction: takes impression of customer's card



3 disadvantages in batch processing

- Processing schedule **predetermined**
 - Errors **unable** to be corrected during processing
 - Sorting transaction data – **expensive** and time consuming
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Backup & recovery

Backup: another copy of data

- Recovery processes include backup, checkpoint and recovery manager

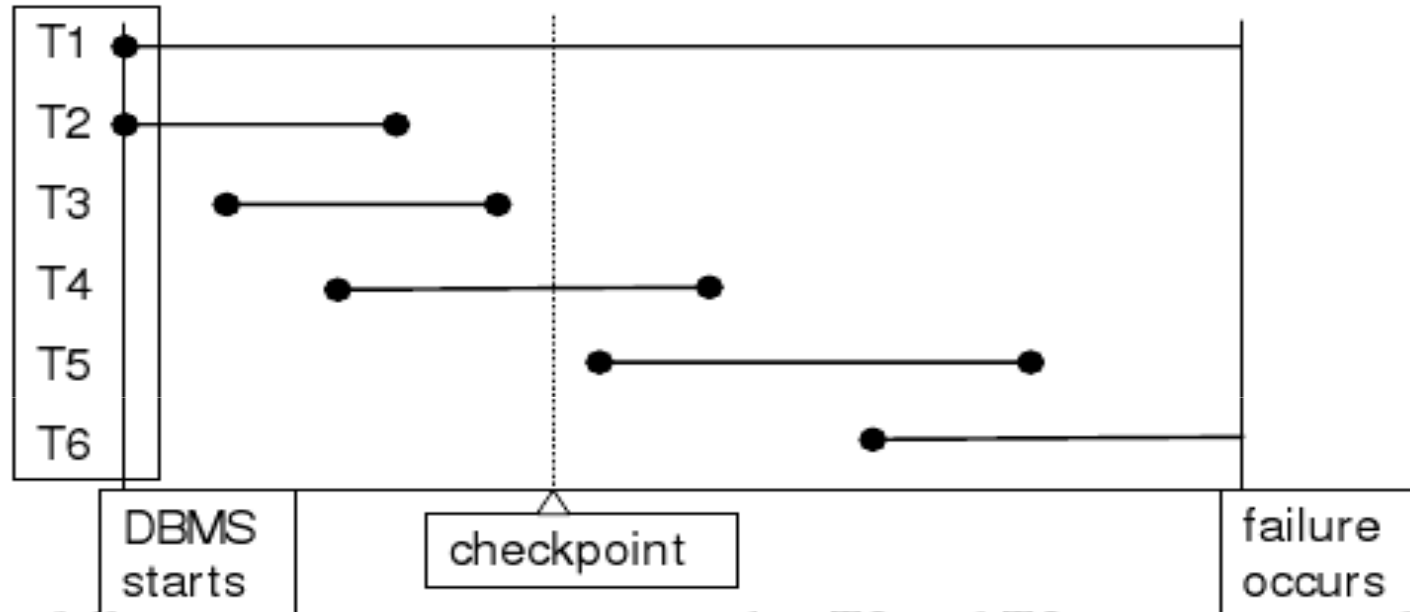
Recovery

- Backward recovery: undo unwanted changes
 - Forward recovery: redo changes
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Recovery

- **Logging** facilities, which keep track of the current state of transactions and database updates.
 - A **checkpoint** facility, which enables updates to the database which are in progress to be made permanent.
 - A **recovery manager**, which allows the system to restore the database to a consistent state following a failure.
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Recovery



T2 dan T3 - permanently recored
T1 dan T6 – undone (abort)
T4 dan T5 – redone (recover)

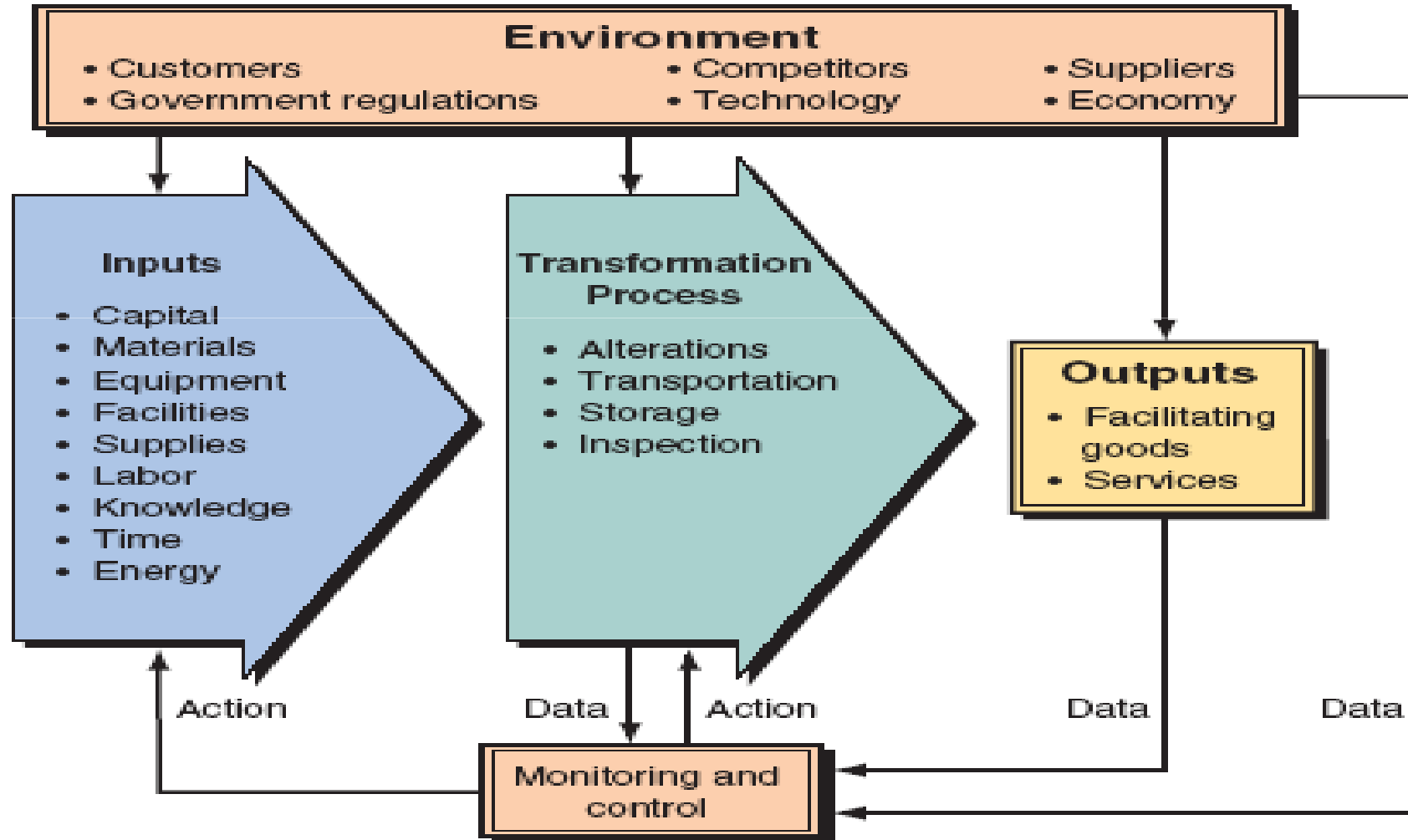
Managing Production/Operations & Logistics

TPS – Managing Production/Operations & Logistics

- A few of the IT supported POM areas are:
 - In-house logistics and materials management
 - Planning production/operations
 - Computer-integrated manufacturing (CIM)
 - Product lifecycle management (PLM)
 - Marketing and Human Resource Management
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Managing Production/Operations & Logistics

TPS – Managing Production/Operations & Logistics



In-House Logistics & Materials Management

- Deals with *ordering, purchasing, inbound logistics* (receiving), & *outbound logistics* (shipping) activities.
 - Purchasing results in incoming materials & parts.
 - Parts inspected for quality then stored.
 - Activities supported by information systems.
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Managing Production/Operations & Logistics

TPS – Planning Production/Operations

POM planning is a major component of operational systems

- **Material Requirements Planning (MRP)** : software yang memamanajemi rencana pembelian bahan baku. Terintegrasi dengan Master Production Schedules, BOM's, dan Inventory levels.
 - **Manufacturing Resource Planning (MRP II)** menambah fungsionalitas pada MRP dgn mencari tahu harga bahan baku dan cash flow, juga mengira-ira upah buruh, harga tools, harga perbaikan, dan laporan2 kebutuhan.
 - **Just-in-Time Systems** suatu pendekatan yang meminimalisasi hal yg tdk berguna (space, labor, materials, energy, dll.) dan meningkatkan processes dan systems. Digunakan pada mass customization dan build-to-order environments.
 - **Project Management.** Terdiri dari bnyk kegiatan, dalam tempo yg cukup lama.
 - Software tools such as: *program evaluation and review technique (PERT)* and the *critical path method (CPM)* are used to manage milestones, resources, costs, etc.
 - **Work Management Systems (WMS)** memamanajemi distribusi barang dan pekerjaan . Berhubungan dengan resource allocation dan reallocation.
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Managing Production/Operations & Logistics

TPS – Product Lifecycle Management

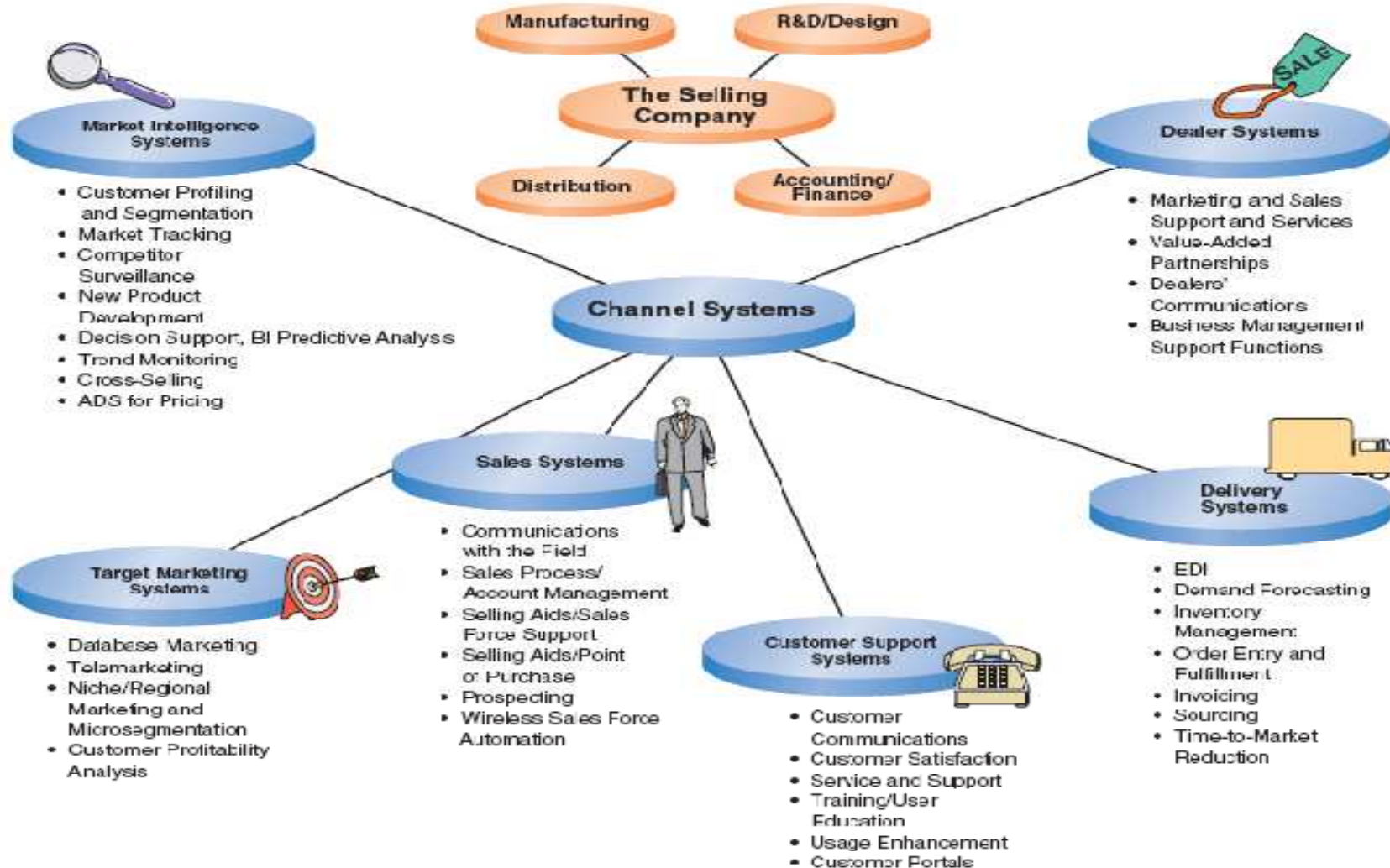


Figure 7.4 Marketing channel systems.

Marketing and Sales Systems

TPS – Customer Relations

It is essential for companies to know who their customers are and to treat them properly. Innovative products and services, successful promotions, customization, and customer service are a necessity for most organization.

- **Customer Profiles and Preference Analysis.** Sophisticated information systems are being developed to collect data on existing and potential customers, their demographics (age, gender, income level), and preferences.
- **Prospective Customer Lists and Marketing Databases.** All firms need to know and track who their existing and potential customers are. These prospective-customer lists can be analyzed and sorted by classification for direct mailing, e-mailing, or telemarketing.
- **Mass Customization.** Today's customers prefer customized products. Through *mass customization*, the practice of maintaining inventory, manufacturers can offer different product configurations at reasonable prices.
- **Personalization.** Special product offers are made, based on where the customer spent their time and on what they may have purchased.
- **Advertising and Promotions.** Special promotions or coupons are presented to the customer via mails, email, wireless and pervasive computing applications.

Marketing and Sales Systems

TPS – Marketing Management

Many marketing management decision applications are supported by computerized information systems.

- **Pricing of Products or Services.** Sales volumes are largely determined by the prices of products or services as is profit.
 - **Salesperson Productivity.** Salespeople differ from each other in selling skill. Sales-force automation increases salesperson productivity by providing them with mobile devices, access to information, etc.
 - **Profitability Analysis** profit contribution of certain products and services can be derived from cost-accounting systems
 - **Sales Analysis And Trends.** Marketing. TPS collect sales figures that can be searched for trends and relationships.
 - **New Products, Services, and Market Planning.** New products and services can be an expensive risk. “Will it sell?” Requires careful analysis, planning, forecasting, and market research.
 - **Web-Based Systems** support marketing and sales through data capture
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TPS – Accounting and Finance Systems

Accounting and finance functional areas manage the inflow and outflow of organizational assets. This involves all functions of an organization including payroll, billing, cash management, etc.

- Financial Planning and Budgeting
 - Financial and Economic Forecasting
 - Planning for Incoming Funds
 - Budgeting
 - Capital Budgeting
 - Managing Financial Transactions
 - Financial and Economic Forecasting
 - Planning for Incoming Funds
 - Budgeting
 - Capital Budgeting
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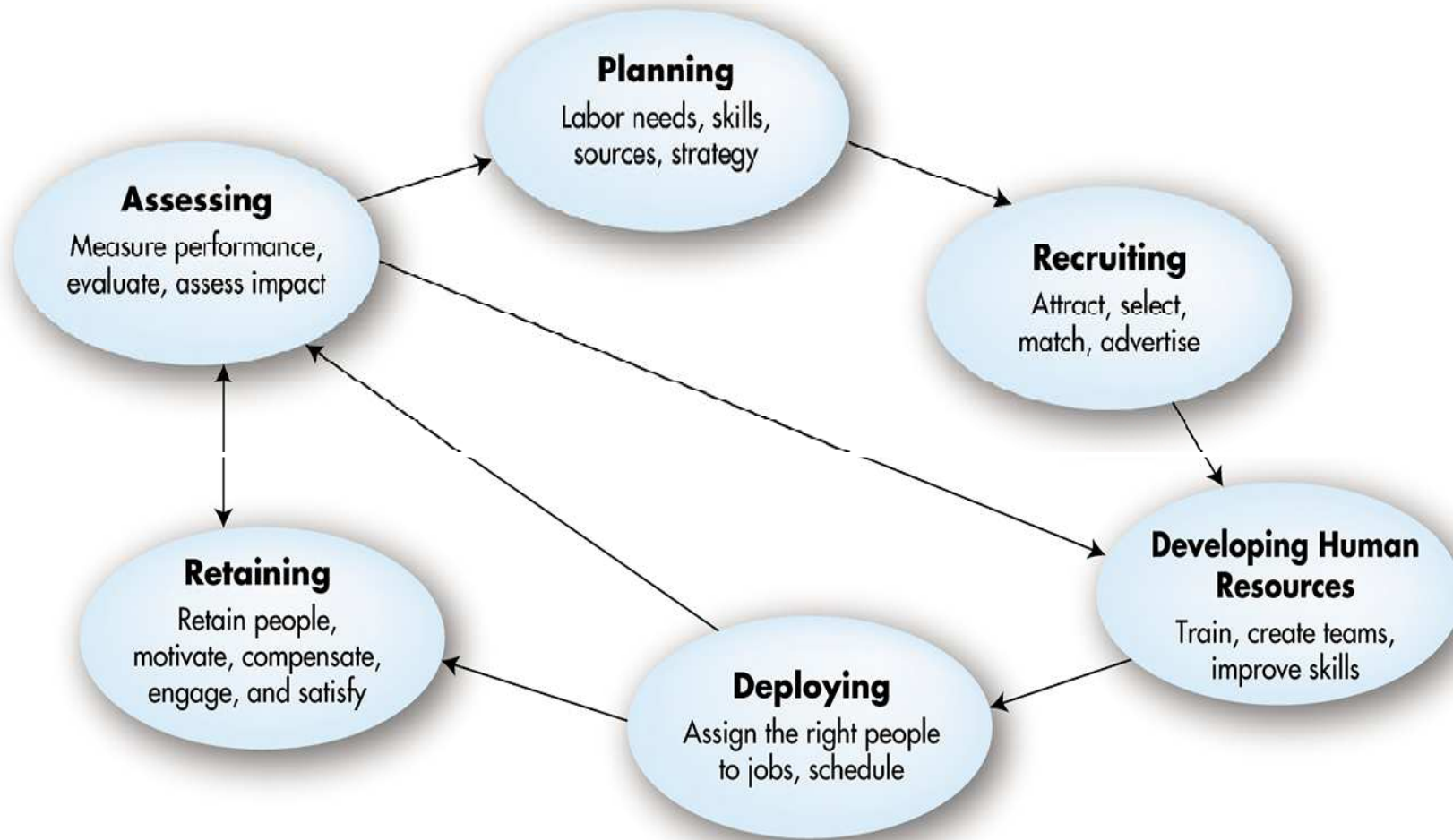
Major Benefits of Using Budgeting Software

- Reduces time & effort in the budget process.
 - Possible to easily explore & analyze implications of organizational & environmental changes.
 - Can facilitate integration of corporate strategic objectives with operational plans.
 - May make planning an ongoing, continuous process.
 - Automatically monitor exceptions for patterns & trends.
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TPS – Human Resources Systems (Continued)

- Human Resources Planning and Management
 - Personnel Planning
 - Labor –Management Negotiations
 - Payroll and Employees' Records
 - Benefits Administration
 - Employee Relationship Management
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HRM Activities



HRM activities.

Recruitment

- **Search engines** on the Web can help with attracting & repelling appropriate candidates.
 - **Internet** makes **advertising** much simpler process, although large numbers may result.
 - **Social networking** sites such as Jobster & LinkedIn have gained widespread popularity.
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HR Maintenance & Development

- **Performance evaluation** – supervisor, peer, &/or subordinate. Wage reviews are also related to performance evaluations.
- **Training & HR development** – planning classes & tailoring specific training programs to meet needs of organization & employees. May include career development plan for each employee.

NEXT

- Enterprise Systems

