11

MENINGKATKAN PENGAMBILAN KEPUTUSAN

(ENHANCING DECISION MAKING)

BUILDING INFORMATION SYSTEMS

MENINGKATKAN PENGAMBILAN KEPUTUSAN

(Enhancing Decision Making)

Learning Objectives

- Apa saja jenis keputusan dan bagaimana pengambilan keputusan proses kerja?
- Bagaimana sistem informasi mendukung kegiatan manajer dan pengambilan keputusan manajemen?
- Bagaimana intelijen bisnis dan bisnis analisis mendukung pengambilan keputusan?
- Bagaimana pengambilan keputusan yang berbeda konstituen dalam penggunaan organisasi intelijen bisnis?
- Apa peran sistem informasi dalam membantu orang yang bekerja dalam kelompok membuat keputusan yang lebih efisien?

Pengambilan Keputusan dan Sistem Informasi

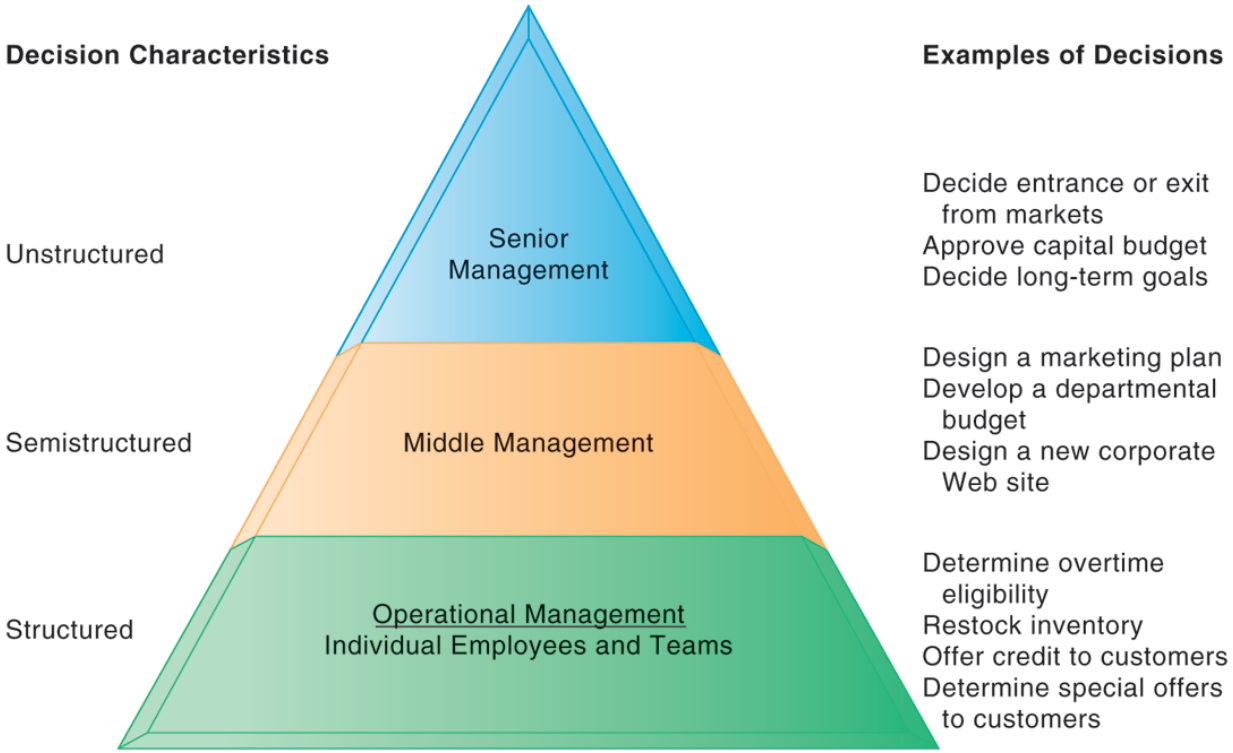
- **Nilai bisnis pengambilan keputusan yang lebih baik**
  - Meningkatkan ratusan ribu "kecil" keputusan menambahkan hingga nilai tahunan besar untuk bisnis
- **Types of decisions:**
  - **Unstructured:** pembuat keputusan harus memberikan penilaian, evaluasi, dan wawasan untuk memecahkan masalah
  - **Structured:** berulang dan rutin, melibatkan prosedur yang pasti untuk menangani sehingga mereka tidak harus diperlakukan setiap kali seperti baru
  - **Semistructured:** Hanya bagian dari masalah telah jelas jawaban yang diberikan oleh prosedur yang diterima

Pengambilan Keputusan dan Sistem Informasi

- **Senior managers:**
  - **Membuat banyak keputusan yang tidak terstruktur**
    Misalnya Haruskah kita memasuki pasar baru?
- **Middle managers:**
  - **Membuat keputusan yang lebih terstruktur tetapi ini mungkin termasuk komponen terstruktur**
    Misalnya Mengapa laporan pemenuhan pesanan yang menunjukkan penurunan di Minneapolis?
- **Operational managers, rank and file employees**
  - **Membuat keputusan yang lebih terstruktur**
  - **Misalnya Apakah pelanggan memenuhi kriteria untuk kredit?**

Pengambilan Keputusan dan Sistem Informasi

PERSYARATAN INFORMASI UTAMA KELOMPOK PENGAMBILAN KEPUTUSAN DALAM PERUSAHAAN



Manajer senior, manajer menengah, manajer operasional, dan karyawan memiliki berbagai jenis keputusan dan kebutuhan informasi.

Pengambilan Keputusan dan Sistem Informasi

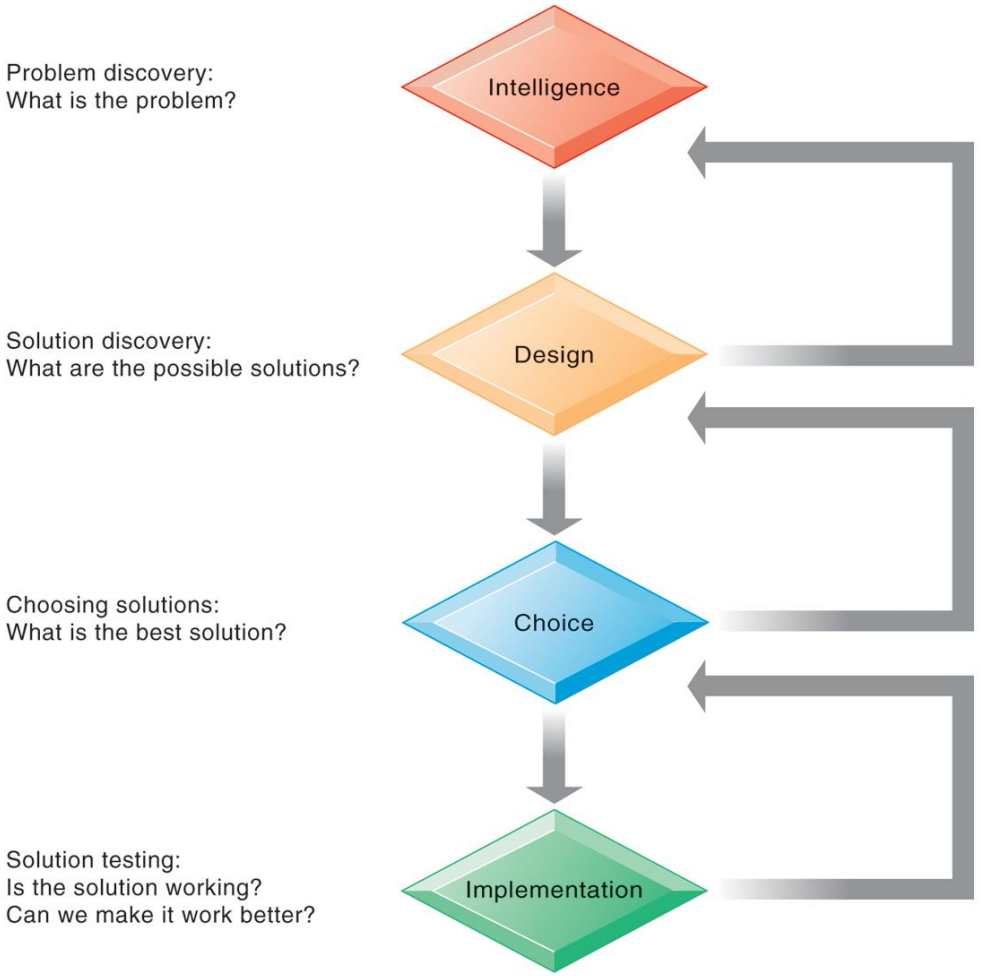
Empat (4) Tahapan proses pengambilan keputusan

1. **Intelligence**
   - Menemukan, mengidentifikasi, dan memahami masalah yang terjadi dalam organisasi
2. **Design**
   - Mengidentifikasi dan mengeksplorasi solusi untuk masalah ini
3. **Choice**
   - Memilih antara alternatif solusi
4. **Implementation**
   - Membuat pekerjaan alternatif yang dipilih dan terus memantau bagaimana solusi baik bekerja

Pengambilan Keputusan dan Sistem Informasi

TAHAPAN DALAM PENGAMBILAN KEPUTUSAN

Proses pengambilan keputusan dipecah menjadi empat tahap.



Pengambilan Keputusan dan Sistem Informasi

- Sistem informasi hanya dapat membantu dalam beberapa peran yang dimainkan oleh manajer
- Model klasik manajemen: 5 fungsi
  - Perencanaan, pengorganisasian, koordinasi, memutuskan, dan mengendalikan
- Model perilaku yang lebih kontempore
  - Perilaku aktual dari manajer tampaknya kurang sistematis, lebih informal, kurang reflektif, lebih reaktif, dan kurang terorganisasi dibandingkan model klasik

Pengambilan Keputusan dan Sistem Informasi

Sepuluh (10) peran manajerial (Henry Mintzberg)

- **Interpersonal roles**
  1. figur
  2. pemimpin
  3. hubungan
- **Informational roles**
  4. pusat kendali
  5. penyebar
  6. Juru Bicara
- **Decisional roles**
  7. pengusaha
  8. penangan gangguan
  9. sumber Daya pengalokasi
  10. perunding

Pengambilan Keputusan dan Sistem Informasi

MANAGERIAL ROLES AND SUPPORTING INFORMATION SYSTEMS

ROLE	BEHAVIOR	SUPPORT SYSTEMS
Interpersonal Roles		
Figurehead		Telepresence systems
Leader	Interpersonal	Telepresence, social networks, Twitter
Liaison		Smartphones, social networks
Informational Roles		
Nerve center		Management information systems, executive support system
Disseminator	Information	E-mail, social networks
Spokesperson	processing	Webinars, telepresence
Decisional Roles		
Entrepreneur	Decision	None exist
Disturbance handler	making	None exist
Resource allocator		Business intelligence, decision-support system
Negotiator		None exist

Sources: Kenneth C. Laudon and Jane P. Laudon; and Mintzberg, 1971.

Three main reasons why investments in information technology do not always produce positive results

1. **Information quality**
   - High-quality decisions require high-quality information
2. **Management filters**
   - Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions
3. **Organizational inertia and politics**
   - Strong forces within organizations resist making decisions calling for major change

High velocity automated decision making

- **Made possible through computer algorithms precisely defining steps for a highly structured decision**
- **Humans taken out of decision**
- **E.g. High-speed computer trading programs**
  - Trades executed in 30 milliseconds
  - Responsible for “Flash Crash” of 2010
- **Require safeguards to ensure proper operation and regulation**

Business Intelligence in the Enterprise

- Business intelligence
  - Infrastructure for collecting, storing, analyzing data produced by business
  - Databases, data warehouses, data marts
- Business analytics
  - Tools and techniques for analyzing data
  - OLAP, statistics, models, data mining
- Business intelligence vendors
  - Create business intelligence and analytics purchased by firms

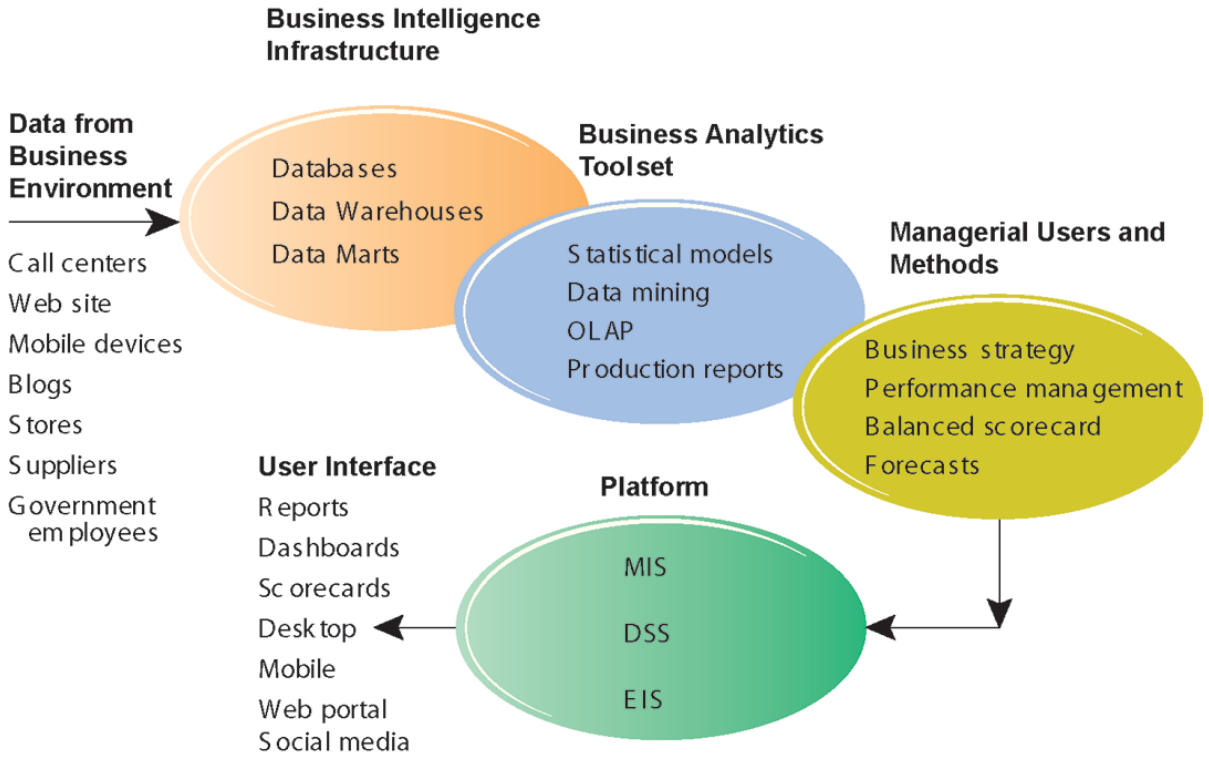
Business Intelligence in the Enterprise

Six elements in the business intelligence environment

1. Data from the business environment
2. Business intelligence infrastructure
3. Business analytics toolset
4. Managerial users and methods
5. Delivery platform – MIS, DSS, ESS
6. User interface

Business Intelligence in the Enterprise

BUSINESS INTELLIGENCE AND ANALYTICS FOR DECISION SUPPORT



Business intelligence and analytics requires a strong database foundation, a set of analytic tools, and an involved management team that can ask intelligent questions and analyze data.

Business Intelligence in the Enterprise

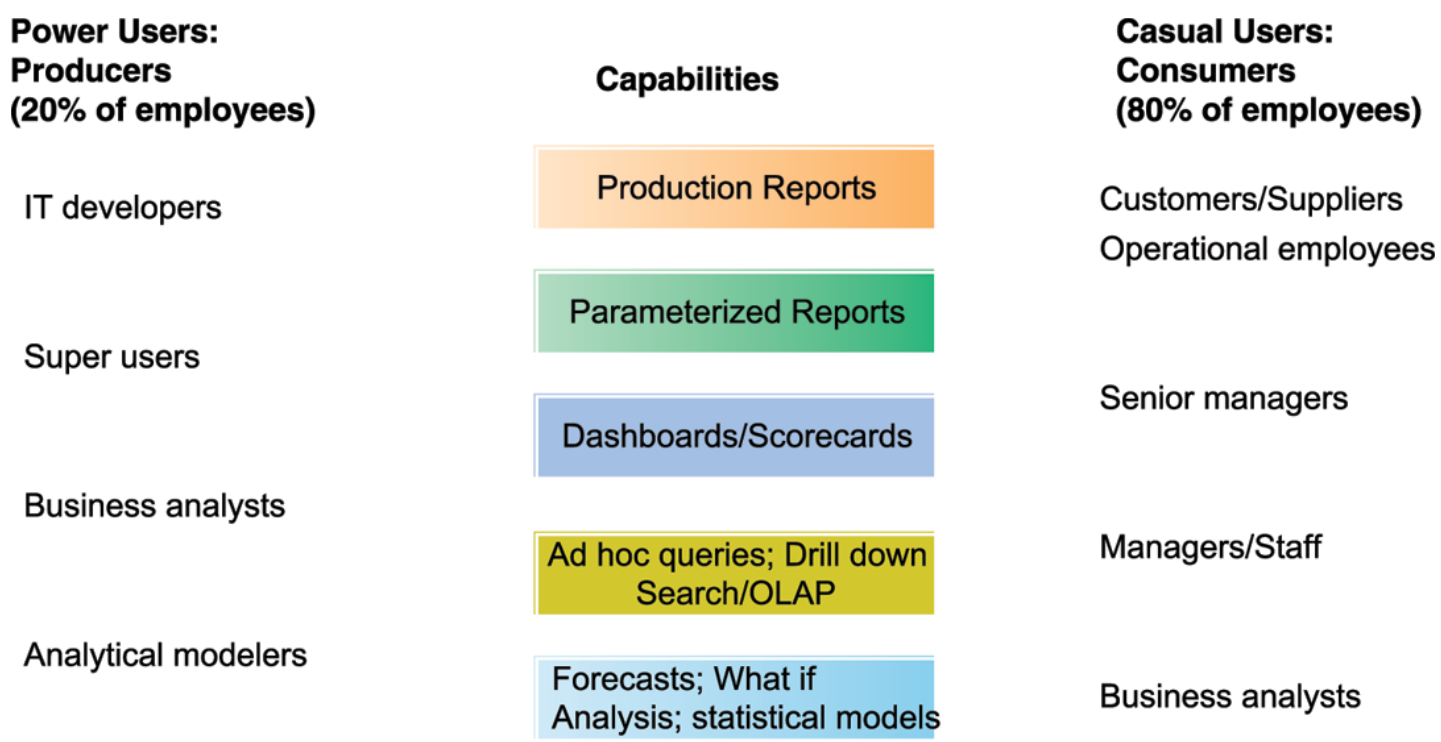
- **Business intelligence and analytics capabilities**
  - **Goal is to deliver accurate real-time information to decision-makers**
  - **Main functionalities of BI systems**
    1. Production reports
    2. Parameterized reports
    3. Dashboards/scorecards
    4. Ad hoc query/search/report creation
    5. Drill down
    6. Forecasts, scenarios, models

Business Intelligence in the Enterprise

- **Business intelligence users**
  - **80% are casual users relying on production reports**
  - **Senior executives**
    - Use monitoring functionalities
  - **Middle managers and analysts**
    - Ad-hoc analysis
  - **Operational employees**
    - Prepackaged reports
    - E.g. sales forecasts, customer satisfaction, loyalty and attrition, supply chain backlog, employee productivity

Business Intelligence in the Enterprise

BUSINESS INTELLIGENCE USERS



Casual users are consumers of BI output, while intense power users are the producers of reports, new analyses, models, and forecasts.

Business Intelligence in the Enterprise

- **Examples of BI applications**
  - **Predictive analytics**
    - Use patterns in data to predict future behavior
    - E.g. Credit card companies use predictive analytics to determine customers at risk for leaving
  - **Data visualization**
    - Help users see patterns and relationships that would be difficult to see in text lists
  - **Geographic information systems (GIS)**
    - Ties location-related data to maps

- **Management strategies for developing business intelligence (BI) and business analytics (BA) capabilities**
  - **Two main strategies**
    1. One-stop integrated solution
       - Hardware firms sell software that run optimally on their hardware
       - Makes firm dependent on single vendor – switching costs
    2. Multiple best-of-breed solution
       - Greater flexibility and independence
       - Potential difficulties in integration
       - Must deal with multiple vendors

DATA-DRIVEN SCHOOLS

- Identify and describe the problem discussed in the case.
- How do business intelligence systems provide a solution to this problem? What are the inputs and outputs of these systems?
- What management, organization, and technology issues must be addressed by this solution?
- How successful is this solution? Explain your answer.
- Should all school districts use such a data-driven approach to education? Why or why not?

Business Intelligence Constituencies

- Operational and middle managers
  - Monitor day to day business performance
  - Make fairly structured decisions
  - Use MIS
- "Super user" and business analysts
  - Use more sophisticated analysis
  - Create customized reports
  - Use DSS

Business Intelligence Constituencies

- **Decision support systems**
  - **Use mathematical or analytical models**
  - **Allow varied types of analysis**
    - "What-if" analysis
    - Sensitivity analysis
    - Backward sensitivity analysis
    - Multidimensional analysis / OLAP
      - E. g. pivot tables

Business Intelligence Constituencies

SENSITIVITY ANALYSIS

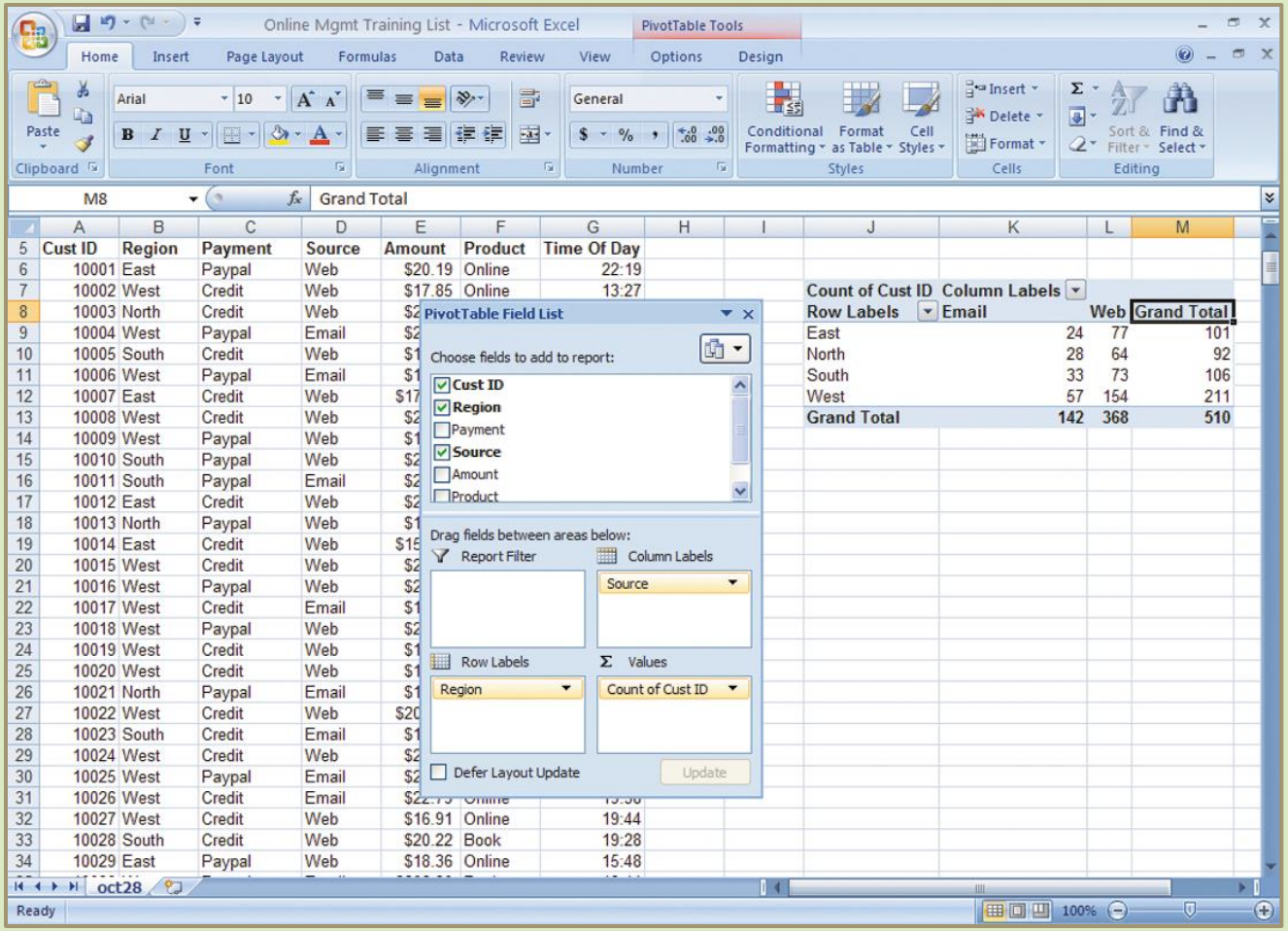
Total fixed costs	19000					
Variable cost per unit	3					
Average sales price	17					
Contribution margin	14					
Break-even point	1357					
		Variable Cost per Unit				
Sales	1357	2	3	4	5	6
Price	14	1583	1727	1900	2111	2375
	15	1462	1583	1727	1900	2111
	16	1357	1462	1583	1727	1900
	17	1267	1357	1462	1583	1727
	18	1188	1267	1357	1462	1583

This table displays the results of a sensitivity analysis of the effect of changing the sales price of a necktie and the cost per unit on the product's break-even point. It answers the question, "What happens to the break-even point if the sales price and the cost to make each unit increases or decreases?"

Business Intelligence Constituencies

A PIVOT TABLE THAT EXAMINES CUSTOMER REGIONAL DISTRIBUTION AND ADVERTISING SOURCE

In this pivot table, we are able to examine where an online training company's customers come from in terms of region and advertising source.



Business Intelligence Constituencies

- **Decision-support for senior management**
  - **Help executives focus on important performance information**
  - **Balanced scorecard method:**
    - Measures outcomes on four dimensions:
      1. Financial
      2. Business process
      3. Customer
      4. Learning & growth
    - Key performance indicators (KPIs) measure each dimension

Business Intelligence Constituencies

THE BALANCED SCORECARD FRAMEWORK

In the balanced scorecard framework, the firm's strategic objectives are operationalized along four dimensions: financial, business process, customer, and learning and growth. Each dimension is measured using several KPIs.

Business Intelligence Constituencies

- **Decision-support for senior management (cont.)**
  - **Business performance management (BPM)**
    - Translates firm's strategies (e.g. differentiation, low-cost producer, scope of operation) into operational targets
    - KPIs developed to measure progress towards targets
  - **Data for ESS**
    - Internal data from enterprise applications
    - External data such as financial market databases
    - Drill-down capabilities

PILOTING VALERO WITH REAL-TIME MANAGEMENT

- What management, organization, and technology issues had to be addressed when developing Valero's dashboard?
- What measures of performance do the dashboards display? Give examples of several management decisions that would benefit from the information provided by Valero's dashboards.
- What kinds of information systems are required by Valero to maintain and operate its refining dashboard?
- How effective are Valero's dashboards in helping management pilot the company? Explain your answer.
- Should Valero develop a dashboard to measure the many factors in its environment that it does not control? Why or why not?

Business Intelligence Constituencies

- **Group Decision Support Systems (GDSS)**
  - **Interactive system to facilitate solution of unstructured problems by group**
  - **Specialized hardware and software; typically used in conference rooms**
    - Overhead projectors, display screens
    - Software to collect, rank, edit participant ideas and responses
    - May require facilitator and staff
  - **Enables increasing meeting size and increasing productivity**
  - **Promotes collaborative atmosphere, guaranteeing anonymity**
  - **Uses structured methods to organize and evaluate ideas**

Building Information Systems

Learning Objectives

- How does building new systems produce organizational change?
- What are the core activities in the systems development process?
- What are the principal methodologies for modeling and designing systems?
- What are the alternative methods for building information systems?
- What are new approaches for system building in the digital firm era?

Systems as Planned Organizational Change

- **Structural organizational changes enabled by IT**
  1. **Automation**
     - Increases efficiency
     - Replaces manual tasks
  2. **Rationalization of procedures**
     - Streamlines standard operating procedures
     - Often found in programs for making continuous quality improvements
       - Total quality management (TQM)
       - Six sigma

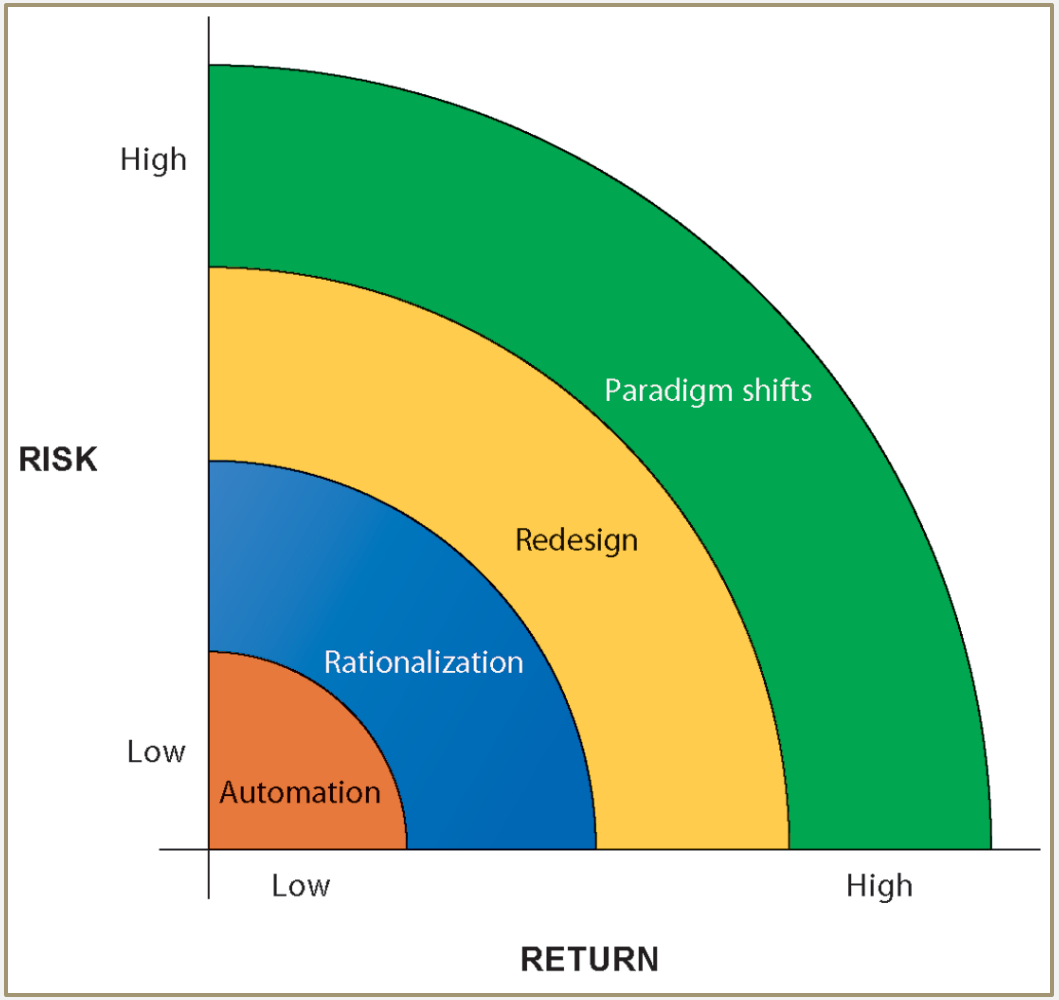
Systems as Planned Organizational Change

- **Structural organizational changes enabled by IT**
  3. **Business process redesign**
     - Analyze, simplify, and redesign business processes
     - Reorganize workflow, combine steps, eliminate repetition
  4. **Paradigm shifts**
     - Rethink nature of business
     - Define new business model
     - Change nature of organization

Systems as Planned Organizational Change

ORGANIZATIONAL CHANGE CARRIES RISKS AND REWARDS

The most common forms of organizational change are automation and rationalization. These relatively slow-moving and slow-changing strategies present modest returns but little risk. Faster and more comprehensive change—such as redesign and paradigm shifts—carries high rewards but offers substantial chances of failure.

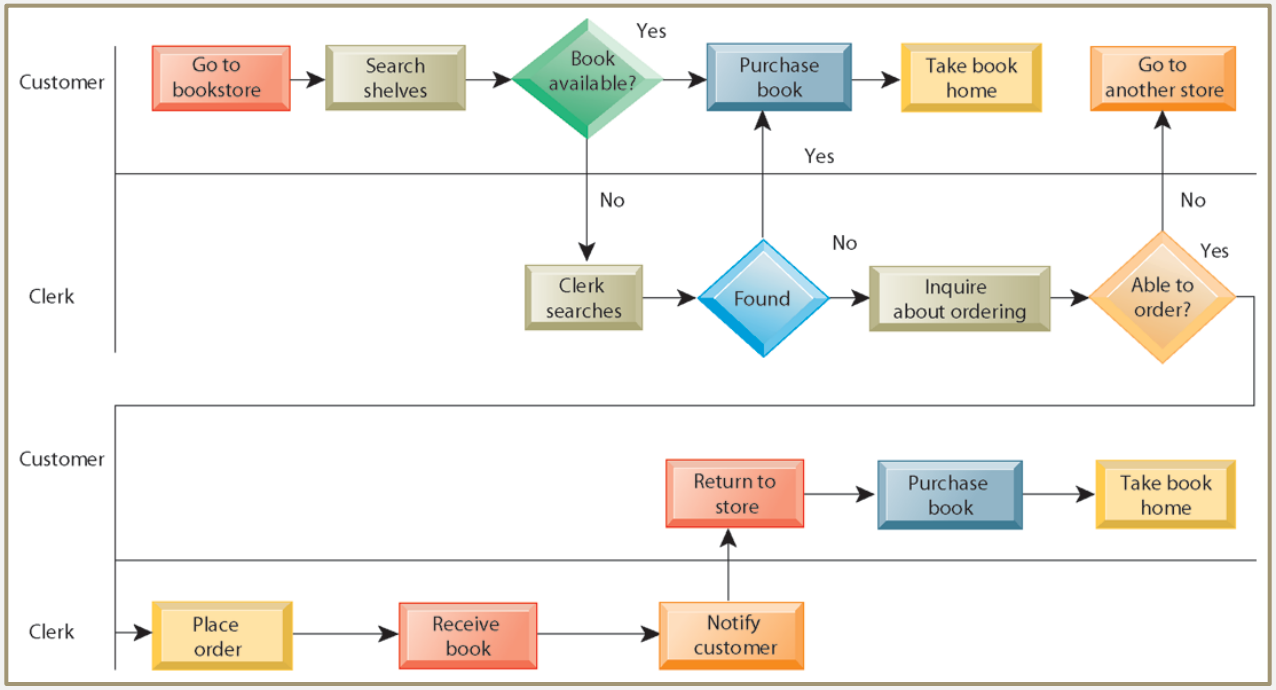


Systems as Planned Organizational Change

- Business process management (BPM)
  - Variety of tools, methodologies to analyze, design, optimize processes
  - Used by firms to manage business process redesign
- Steps in BPM
  1. Identify processes for change
  2. Analyze existing processes
  3. Design the new process
  4. Implement the new process
  5. Continuous measurement

Systems as Planned Organizational Change

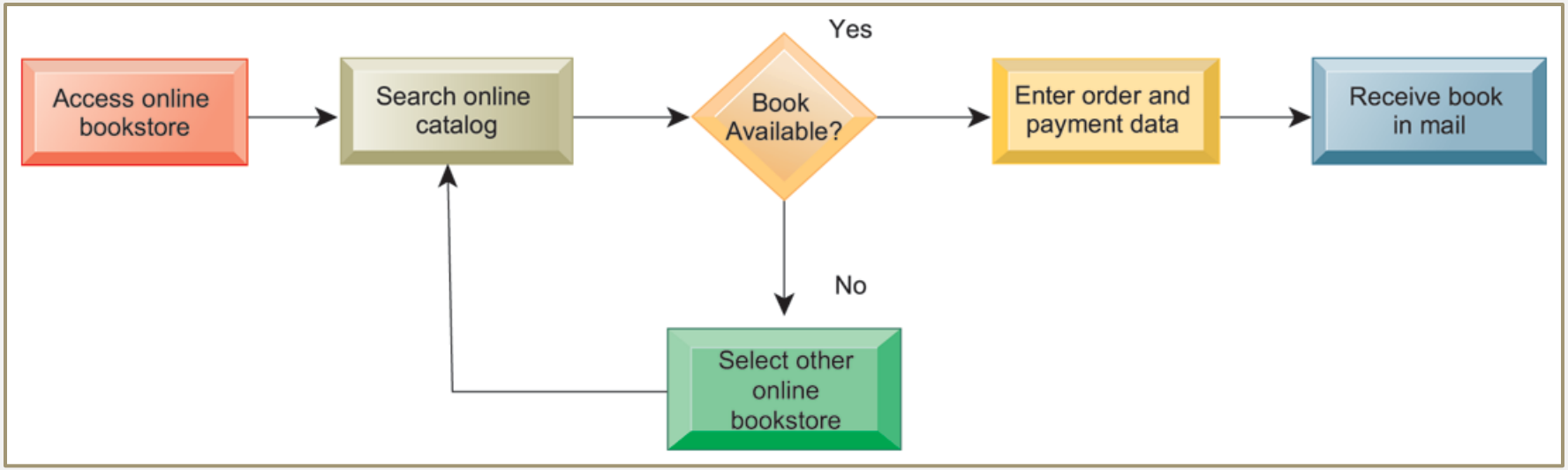
AS-IS BUSINESS PROCESS FOR PURCHASING A BOOK FROM A PHYSICAL BOOKSTORE



Purchasing a book from a physical bookstore requires many steps to be performed by both the seller and the customer.

Systems as Planned Organizational Change

REDESIGNED PROCESS FOR PURCHASING A BOOK ONLINE



Using Internet technology makes it possible to redesign the process for purchasing a book so that it requires fewer steps and consumes fewer resources.

Systems as Planned Organizational Change

- **Variety of tools for BPM, to**
  - **Identify and document existing processes**
    - Identify inefficiencies
  - **Create models of improved processes**
  - **Capture and enforce business rules for performing processes**
  - **Integrate existing systems to support process improvements**
  - **Verify that new processes have improved**
  - **Measure impact of process changes on key business performance indicators**

Systems as Planned Organizational Change

CAN BUSINESS PROCESS MANAGEMENT MAKE A DIFFERENCE?

- **Why are large companies such as AmerisourceBergen and Diebold good candidates for business process management?**
- **What were the business benefits for each company from redesigning and managing their business processes?**
- **How did BPM change the way these companies ran their businesses?**
- **What might be some of the problems with extending BPM software across a large number of business processes?**
- **What companies stand to gain the most by implementing BPM?**

Overview of Systems Development

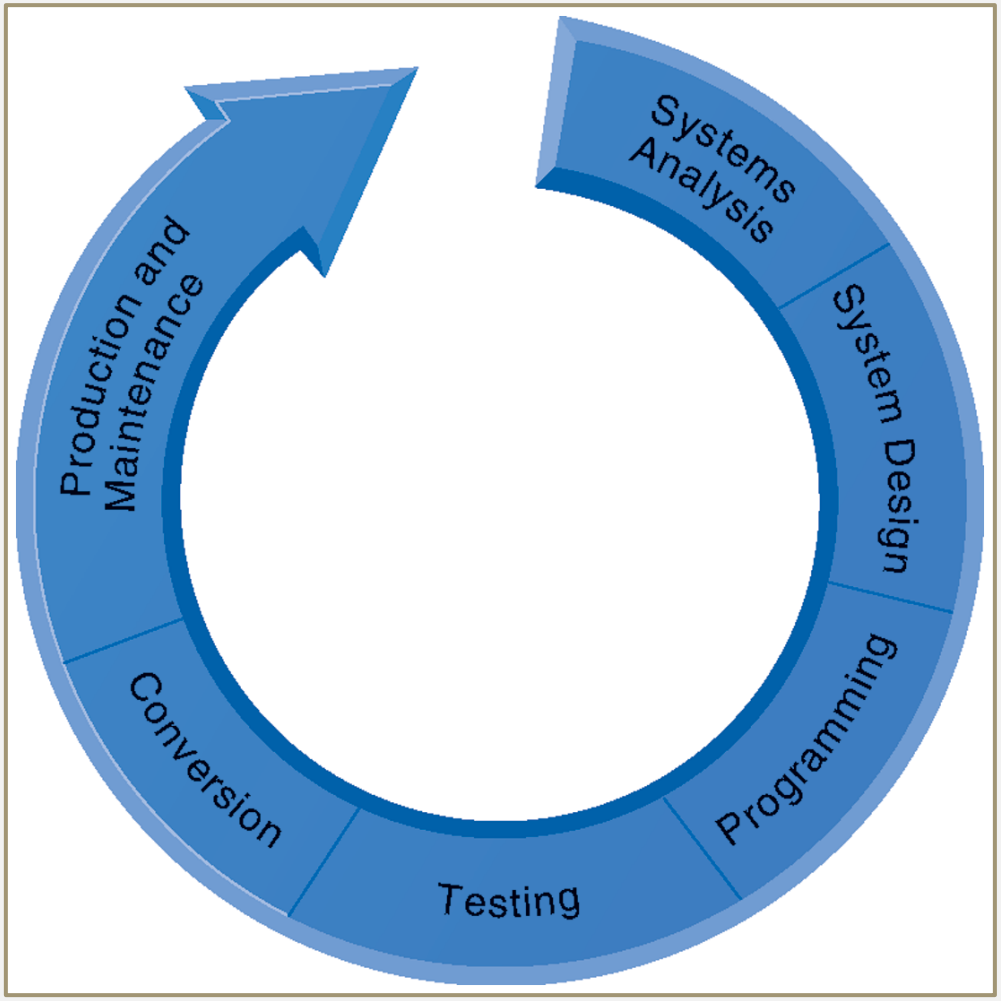
- **Systems development:**
  - **Activities that go into producing an information system solution to an organizational problem or opportunity**

1. **Systems analysis**
2. **Systems design**
3. **Programming**
4. **Testing**
5. **Conversion**
6. **Production and maintenance**

Overview of Systems Development

THE SYSTEMS DEVELOPMENT PROCESS

Building a system can be broken down into six core activities.



Overview of Systems Development

- **Systems analysis**
  - **Analysis of problem to be solved by new system**
    - Defining the problem and identifying causes
    - Specifying solutions
      - Systems proposal report identifies and examines alternative solutions
    - Identifying information requirements
  - **Includes feasibility study**
    - Is solution feasible and good investment?
    - Is required technology, skill available?

- **System analysis (cont.)**
  - **Establishing information requirements**
    - Who needs what information, where, when, and how
    - Define objectives of new/modified system
    - Detail the functions new system must perform
  - **Faulty requirements analysis is leading cause of systems failure and high systems development cost**

Overview of Systems Development

- **Systems design**
  - **Describes system specifications that will deliver functions identified during systems analysis**
  - **Should address all managerial, organizational, and technological components of system solution**
  - **Role of end users**
    - User information requirements drive system building
    - Users must have sufficient control over design process to ensure system reflects their business priorities and information needs
    - Insufficient user involvement in design effort is major cause of system failure

Overview of Systems Development

OUTPUT
Medium
Content
Timing

INPUT
Origins
Flow
Data entry

USER INTERFACE
Simplicity
Efficiency
Logic
Feedback
Errors

DATABASE DESIGN
Logical data model
Volume and speed requirements
File organization and design
Record specifications

PROCESSING
Computations
Program modules
Required reports
Timing of outputs

MANUAL PROCEDURES
What activities
Who performs them
When
How
Where

CONTROLS
Input controls (characters, limit, reasonableness)
Processing controls (consistency, record counts)
Output controls (totals, samples of output)
Procedural controls (passwords, special forms)

SECURITY
Access controls
Catastrophe plans
Audit trails

DOCUMENTATION
Operations documentation
Systems documents
User documentation

CONVERSION
Transfer files
Initiate new procedures
Select testing method
Cut over to new system

TRAINING
Select training techniques
Develop training modules
Identify training facilities

ORGANIZATIONAL CHANGES
Task redesign
Job redesign
Process design
Organization structure design
Reporting relationships

Overview of Systems Development

- **Programming:**
  - System specifications from design stage are translated into software program code
- **Testing**
  - Ensures system produces right results
  - Unit testing: Tests each program in system separately
  - System testing: Test functioning of system as a whole
  - Acceptance testing: Makes sure system is ready to be used in production setting
  - Test plan: All preparations for series of tests

Overview of Systems Development

A SAMPLE TEST PLAN TO TEST A RECORD CHANGE

Procedure	Address and Maintenance "Record Change Series"		Test Series 2		
	Prepared By:		Date:	Version:	
Test Ref.	Condition Tested	Special Requirements	Expected Results	Output On	Next Screen
2.0	Change records				
2.1	Change existing record	Key field	Not allowed		
2.2	Change nonexistent record	Other fields	"Invalid key" message		
2.3	Change deleted record	Deleted record must be available	"Deleted" message		
2.4	Make second record	Change 2.1 above	OK if valid	Transaction file	V45
2.5	Insert record		OK if valid	Transaction file	V45
2.6	Abort during change	Abort 2.5	No change	Transaction file	V45

When developing a test plan, it is imperative to include the various conditions to be tested, the requirements for each condition tested, and the expected results. Test plans require input from both end users and information systems specialists.

Overview of Systems Development

- **Conversion**
  - **Process of changing from old system to new system**
  - **Four main strategies**
    1. Parallel strategy
    2. Direct cutover
    3. Pilot study
    4. Phased approach
  - **Requires end-user training**
  - **Finalization of detailed documentation showing how system works from technical and end-user standpoint**

Overview of Systems Development

- **Production and maintenance**
  - **System reviewed to determine if revisions needed**
  - **May include post-implementation audit document**
  - **Maintenance**
    - Changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency
      - 20% debugging, emergency work
      - 20% changes to hardware, software, data, reporting
      - 60% of work: User enhancements, improving documentation, recoding for greater processing efficiency

Overview of Systems Development

SUMMARY OF SYSTEMS DEVELOPMENT ACTIVITIES	
CORE ACTIVITY	**DESCRIPTION**
Systems analysis	**Identify problem(s)** **Specify solutions** **Establish information requirements**
Systems design	**Create design specifications**
Programming	**Translate design specifications into code**
Testing	**Unit test** **Systems test** **Acceptance test**
Conversion	**Plan conversion** **Prepare documentation** **Train users and technical staff**
Production and maintenance	**Operate the system** **Evaluate the system** **Modify the system**

Overview of Systems Development

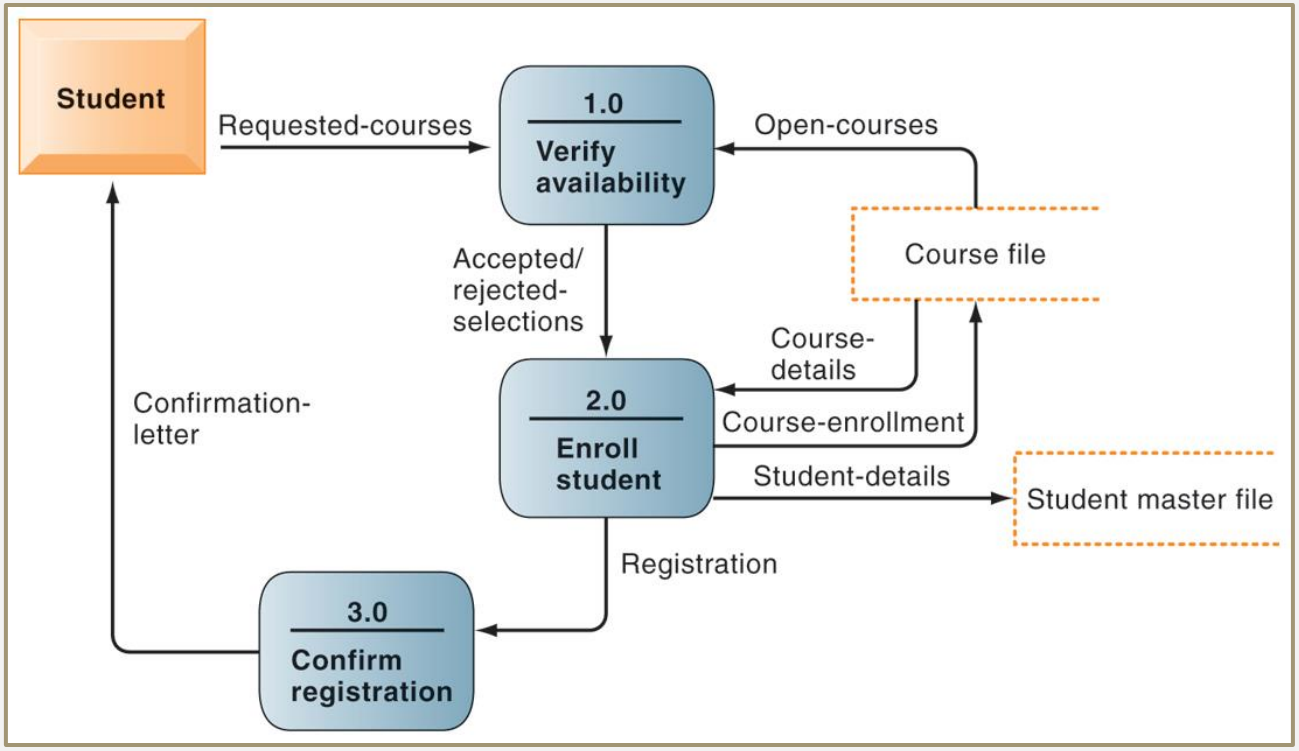
- **Most prominent methodologies for modeling and designing systems:**
  1. **Structured methodologies**
  2. **Object-oriented development**
- **Structured methodologies**
  - **Structured:** Techniques are step-by-step, progressive
  - **Process-oriented:** Focusing on modeling processes or actions that manipulate data
  - **Separate data from processes**

Overview of Systems Development

- **Data flow diagram:**
  - **Primary tool for representing system's component processes and flow of data between them**
  - **Offers logical graphic model of information flow**
  - **High-level and lower-level diagrams can be used to break processes down into successive layers of detail**
- **Data dictionary:** Defines contents of data flows and data stores
- **Process specifications:** Describe transformation occurring within lowest level of data flow diagrams
- **Structure chart:** Top-down chart, showing each level of design, relationship to other levels, and place in overall design structure

Overview of Systems Development

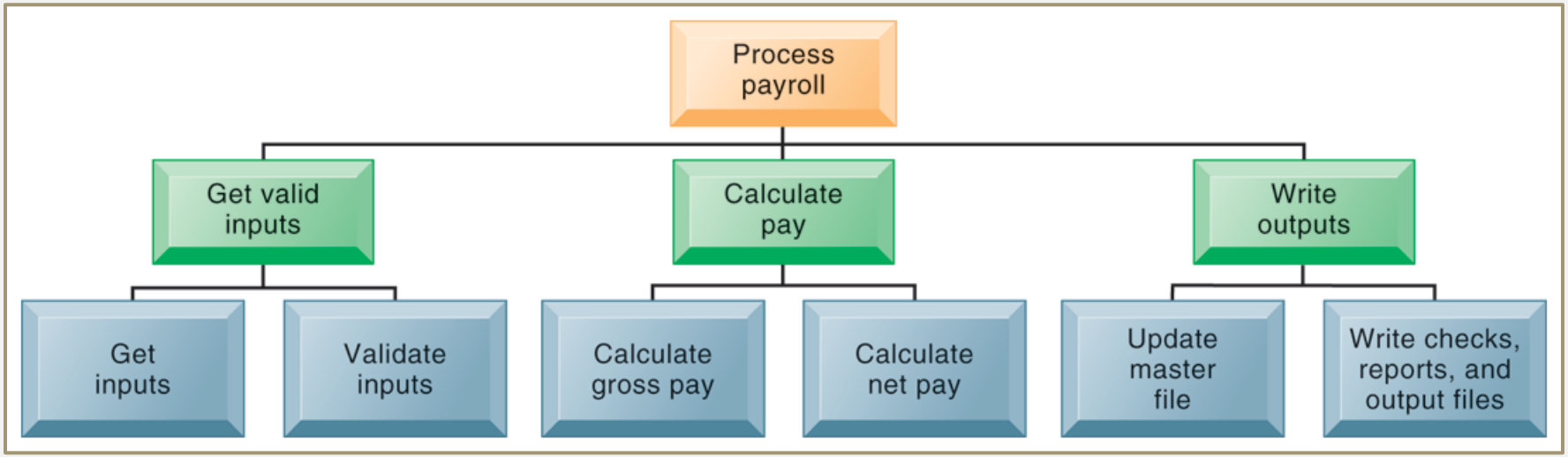
DATA FLOW DIAGRAM FOR MAIL-IN UNIVERSITY REGISTRATION SYSTEM



The system has three processes: Verify availability (1.0), Enroll student (2.0), and Confirm registration (3.0). The name and content of each of the data flows appear adjacent to each arrow. There is one external entity in this system: the student. There are two data stores: the student master file and the course file.

Overview of Systems Development

HIGH-LEVEL STRUCTURE CHART FOR A PAYROLL SYSTEM



This structure chart shows the highest or most abstract level of design for a payroll system, providing an overview of the entire system.

Alternative Systems Building Approaches

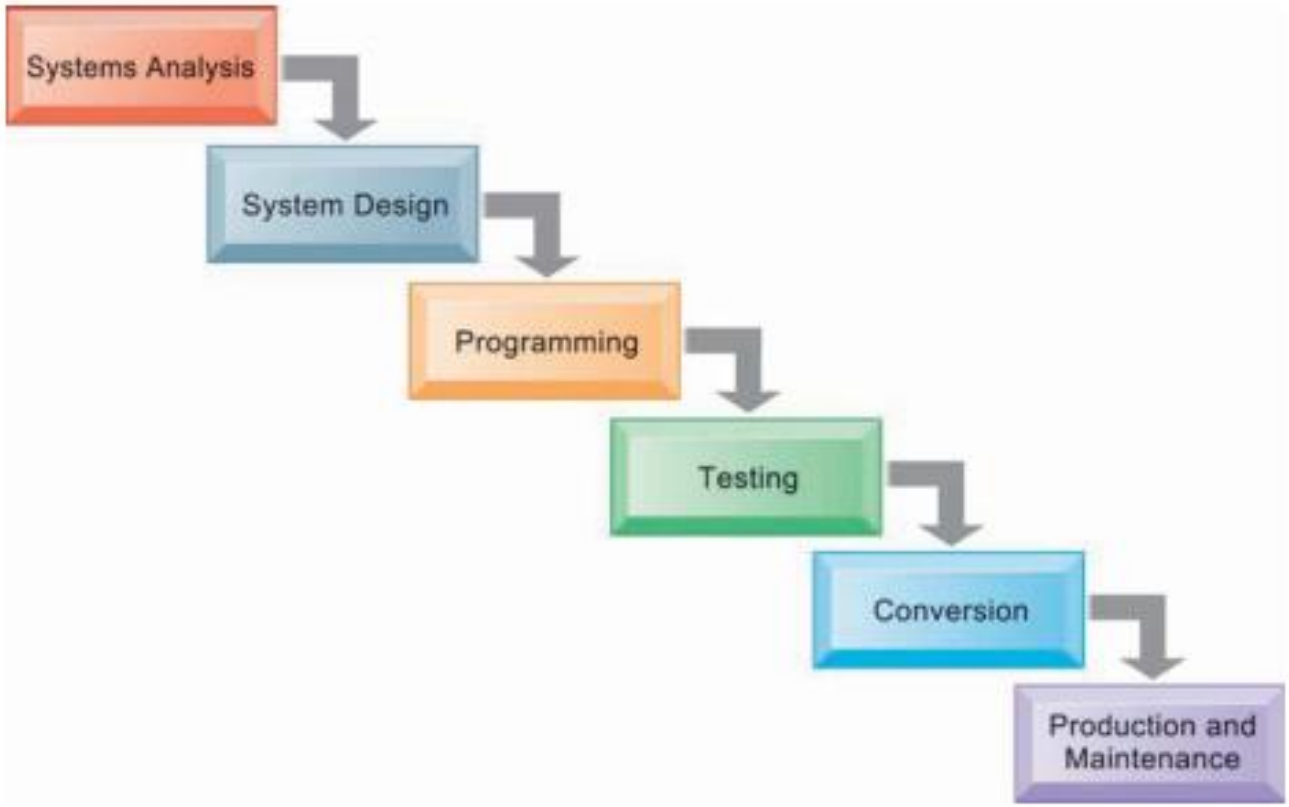
- **Alternative Systems-Building Methods**
  - Traditional systems life-cycle
  - Prototyping
  - End-user development
  - Application software packages
  - Outsourcing

Alternative Systems Building Approaches

- **Traditional systems lifecycle:**
  - **Oldest method for building information systems**
  - **Phased approach divides development into formal stages**
    - Follows "waterfall" approach: Tasks in one stage finish before another stage begins
  - **Maintains formal division of labor between end users and information systems specialists**
  - **Emphasizes formal specifications and paperwork**
  - **Still used for building large complex systems**
  - **Can be costly, time-consuming, and inflexible**

Alternative Systems Building Approaches

FIGURE 13.9 THE TRADITIONAL SYSTEMS DEVELOPMENT LIFE CYCLE



The systems development life cycle partitions systems development into formal stages, with each stage requiring completion before the next stage can begin.


Terima Kasih
ngiyabonga
рахмат
danke
謝謝
teşekkür ederim
Баярлалаа
спасибо
thank you
gracias
dank je
tapadh leat
faafetai lava
vinaka
спасибі
blagodaram
misaotra
matondo
paldies
grazzi
mahalo
kiitos
dankie
хвала
asante
manana
dhanyavad
köszönöm
akun
dankon
obrigada
tenki
bedankt
hvala
mauruuru
enkosi
bayarlalaa
djiere dieuf
tau
mochchakkeram
murakoze
dziękuję
дякую
mamnun
chnorakaloutioun
gratias ago
gràcies
sulpáy
go raibh maith agat
chokrane
sobodi
dēkuji
sukriya
kop khun krap
taiku
sagolun
takk
arigatô
dakujem
trugarez
obrigado
mèsi
didi madloba
ありがとう
tanemirt
grazie
najis tuke
terima kasih
rahmet
dhanyavadagalu
shukriya
мерси
merci
kam sah hamnida
rahmat
তোমাকে ধন্যবাদ
감사합니다
xièxie
ευχαριστώ