CIS (21-774)
Computer Information Systems
in
Industrial Engineering

Department of Industrial Engineering

Sharif University of Technology

Session# 13

Course Description *(Continued..)*

▪ *Contents:*

  ▪ *The role of managers in Information Technology (IT)*   *(3 sessions)*

  ▪ *Organizational Issues*   *(3 sessions)*

  ▪ *Information Technology*   *(9 sessions)*

  ▪ *Operational and enterprises systems*   *(4 sessions)*

  ▪ *Exciting directions in systems*   *(3 sessions)*

  ▪ *E-Business and E-Commerce*   *(3 sessions)*

  ▪ *Issues for senior management*   *(2 sessions)*

Course Description *(Continued..)*

- *Contents:*
  - *Information Technology* *(9 sessions)*
    - *Fundamentals*
      - *The components of a personal computer*
    - *Software*
      - *Managerial concerns*
      - *The Contribution of Higher-Level languages*
      - *The Web Browser and Internet standards*
      - *The operating system*
    - *Database management*
      - *File elements*
      - *Enter database management software*
      - *Database in systems design*
      - *Data Warehouses, Data Marts, and Data Centers*
      - *Enterprise Content Management*
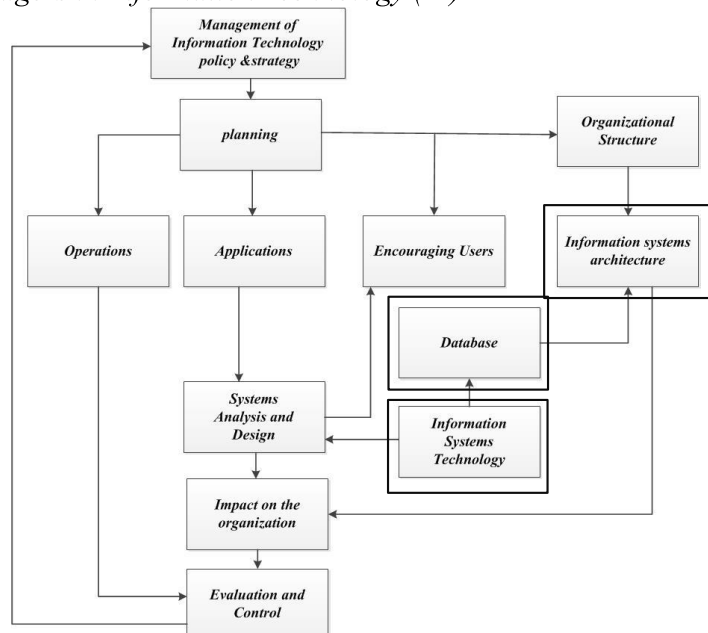
Course Description *(Continued..)*

- *Contents:*
  - *Information Technology (Continued …)* *(9 sessions)*
    - *Communications*
      - *Communications between computers*
      - *Networks*
    - *Information Technology architecture*
      - *Hardware & software architecture*
    - *System alternatives and acquisition*
      - *To buy or not: major applications*
      - *The services industry*
      - *The pros and cons of outsourcing*
      - *Enterprise software packages*
    - *Building information systems*
      - *The design task*
      - *Systems design life cycle*
      - *Data collection for analysis and design*

The role of managers in Information Technology (IT)


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Information Technology

- *Communications*
  - *Communications technology makes it possible to share data within the company and with external organizations.*

  - *Communication removes constraints on the time and place for work and makes possible the creation of new structures that cut across traditional lines on the organization chart*

  - *Several applications that depend on telecommunications, such as e-mail and electric data interchange (EDI), illustrate how this technology contributes to the organization.*

Information Technology

- *Communications*
  - *Communications between computers*
  - *The most familiar type of communications is probably the case in which device 1 is a PC and device 2 is a server of some type.*
  - *The transmission line may be nothing more complex than a pair of twisted wires from the terminal leading to a central computer that offers time-sharing services.*
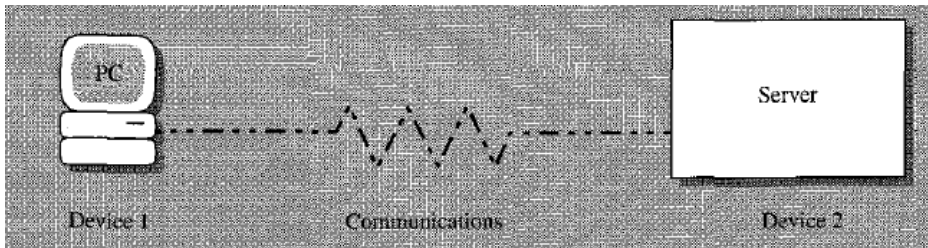
Information Technology

- *Communications*
  - *Communications between computers*
  - *The data sent over the line are represented as some type of code; that is, the sending and receiving ends of the communications lines have to agree on how to represent symbols*

  - *The most frequent code for interchanging data is called ASCII (American Standard Code for Information Interchange), which is a 7-bit code (there is an eighth bit for error checking) and thus has 128 symbols*

  - *All codes, then, use sequences of O's and 1 's to represent different symbols. As an example, the ASCII code for H is 1 00 1 000*

Dec	Hx	Oct	Char		Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr		Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)		32	20	040	 	Space		64	40	100	@	@		96	60	140	`	`
1	1	001	SOH (start of heading)		33	21	041	!	!		65	41	101	A	A		97	61	141	a	a
2	2	002	STX (start of text)		34	22	042	"	"		66	42	102	B	B		98	62	142	b	b
3	3	003	ETX (end of text)		35	23	043	#	#		67	43	103	C	C		99	63	143	c	c
4	4	004	EOT (end of transmission)		36	24	044	$	$		68	44	104	D	D		100	64	144	d	d
5	5	005	ENQ (enquiry)		37	25	045	%	%		69	45	105	E	E		101	65	145	e	e
6	6	006	ACK (acknowledge)		38	26	046	&	&		70	46	106	F	F		102	66	146	f	f
7	7	007	BEL (bell)		39	27	047	'	'		71	47	107	G	G		103	67	147	g	g
8	8	010	BS (backspace)		40	28	050	(	(		72	48	110	H	H		104	68	150	h	h
9	9	011	TAB (horizontal tab)		41	29	051	)	)		73	49	111	I	I		105	69	151	i	i
10	A	012	LF (NL line feed, new line)		42	2A	052	*	*		74	4A	112	J	J		106	6A	152	j	j
11	B	013	VT (vertical tab)		43	2B	053	+	+		75	4B	113	K	K		107	6B	153	k	k
12	C	014	FF (NP form feed, new page)		44	2C	054	,	,		76	4C	114	L	L		108	6C	154	l	l
13	D	015	CR (carriage return)		45	2D	055	-	-		77	4D	115	M	M		109	6D	155	m	m
14	E	016	SO (shift out)		46	2E	056	.	.		78	4E	116	N	N		110	6E	156	n	n
15	F	017	SI (shift in)		47	2F	057	/	/		79	4F	117	O	O		111	6F	157	o	o
16	10	020	DLE (data link escape)		48	30	060	0	0		80	50	120	P	P		112	70	160	p	p
17	11	021	DC1 (device control 1)		49	31	061	1	1		81	51	121	Q	Q		113	71	161	q	q
18	12	022	DC2 (device control 2)		50	32	062	2	2		82	52	122	R	R		114	72	162	r	r
19	13	023	DC3 (device control 3)		51	33	063	3	3		83	53	123	S	S		115	73	163	s	s
20	14	024	DC4 (device control 4)		52	34	064	4	4		84	54	124	T	T		116	74	164	t	t
21	15	025	NAK (negative acknowledge)		53	35	065	5	5		85	55	125	U	U		117	75	165	u	u
22	16	026	SYN (synchronous idle)		54	36	066	6	6		86	56	126	V	V		118	76	166	v	v
23	17	027	ETB (end of trans. block)		55	37	067	7	7		87	57	127	W	W		119	77	167	w	w
24	18	030	CAN (cancel)		56	38	070	8	8		88	58	130	X	X		120	78	170	x	x
25	19	031	EM (end of medium)		57	39	071	9	9		89	59	131	Y	Y		121	79	171	y	y
26	1A	032	SUB (substitute)		58	3A	072	:	:		90	5A	132	Z	Z		122	7A	172	z	z
27	1B	033	ESC (escape)		59	3B	073	;	;		91	5B	133	[	[		123	7B	173	{	{
28	1C	034	FS (file separator)		60	3C	074	<	<		92	5C	134	\	\		124	7C	174	|		
29	1D	035	GS (group separator)		61	3D	075	=	=		93	5D	135	]	]		125	7D	175	}	}
30	1E	036	RS (record separator)		62	3E	076	>	>		94	5E	136	^	^		126	7E	176	~	~
31	1F	037	US (unit separator)		63	3F	077	?	?		95	5F	137	_	_		127	7F	177	&#127;	DEL

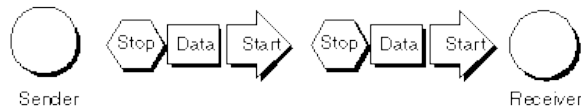Source: www.LookupTables.com

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Information Technology

- *Communications*
  - *Transmission Modes*
  - *There are a number of options for transmitting data over communications lines.*
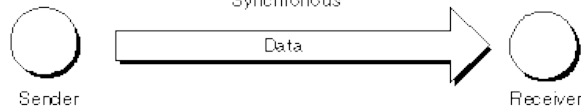   - *Character mode*
    - *Block mode*
    - *Asynchronous mode*
    - *Synchronous mode*

Asynchronous

Sender — Stop | Data | Start — Stop | Data | Start — Receiver

Synchronous

Sender — Data — Receiver

Information Technology

- *Communications*
 - *Direction of Transmission*

    - *In simplex transmission, the data are sent in one direction only, but this approach is rare.*

    - *Using half duplex transmission, data travel in two directions but not at the same time.*

    - *With full duplex transmission, data are transmitted simultaneously in both directions.*

Information Technology
- *Communications*
  - *Signal representation*
    - *There are two basic ways to represent signals:*
    - *Analog Signals which are used because the first data* [...]
      telephone lines, originally developed to carry analog [...]

    - *Because computer devices communicate in digital for* [...]
      to an analog signal (modulated) for transmission and [...]
      the receiving end.
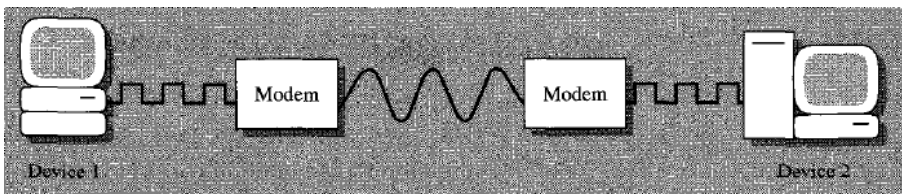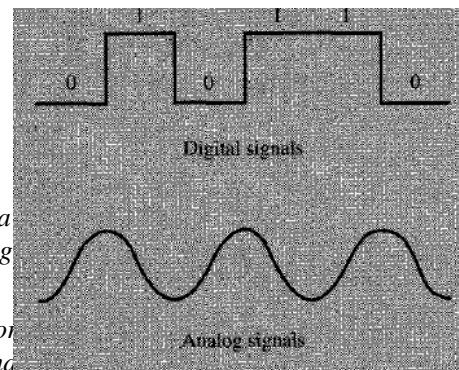
Information Technology

- *Communications*
  - *Signal representation*
    - *Your personal computer probably has a modem that operates at up to 56 Kbits per second over a dial-up phone line.*

    - *Using this modem, you can connect to a variety of computers, though it is unlikely you will actually communicate at the modem's maximum speed due to the limitations of the local line to your telephone.*

Information Technology

- *Communications*
  - *Signal representation*
    - *Speed of Transmission*
    - *The communications specialist uses a measure of speed called a baud, which is the number of times per second that the signal changes.*

TRANSMISSION SPEEDS

For home		For a network	
PC Modem	56 Kbps	Voice grade	56 Kbps
ISDN	64 or 128 Kbps	T1 line	1.544 Mbps
ADSL	44 Kbps to 8 Mbps	T3 line	45 Mbps
Cable modem	384 Kbps to 4 Mbps	DS3 line	45 Mbps
DirecPC Satellite	400 Kbps	OC3 connection	155 Mbps
Wireless	Up to 4 Mbps home, 1,555 Mbps business	OC12 connection	622 Mbps
		OC48 connection	2.45 Gbps

Information Technology

- *Communications*
  - *Protocol*
    - *Transmission involves protocols, which are sets of rules and procedures to control the flow of data between points.*
    - *Both the sending and receiving stations need to follow the same procedures.*
    - *A protocol can also increase the efficiency of transmission by reducing the amount of data that must be sent for control purposes like:*
      - *Setting up a session,*
      - *Establishing a path from nodes 1 to n,*
      - *Linking devices together*
      - *The hardware sending and interpreting the data,*
      - *Detection and correction of errors*
      - *Formatting, Line control, Message sequencing*

Information Technology

- *Communications*
  - *Protocol*
    - *The International Standards Organization (ISO) has suggested a layered architecture to facilitate communications among different types of equipment. The seven logical layers are as follows (the numbering follows the ISO designation of levels);*
    - *7. Application.*
    - *6. Presentation.*
    - *5. Session.*
    - *4. Transport.*
    - *3. Network.*
    - *2. Data link.*
    - *1. Physical.*

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