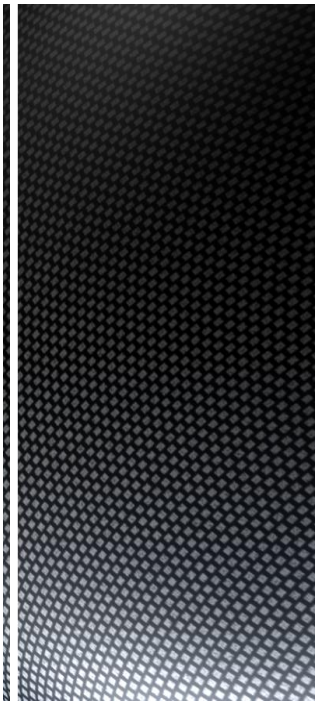
CIS (21-774)
Computer Information Systems
in
Industrial Engineering

Department of Industrial Engineering
Sharif University of Technology

Session# 10



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)*

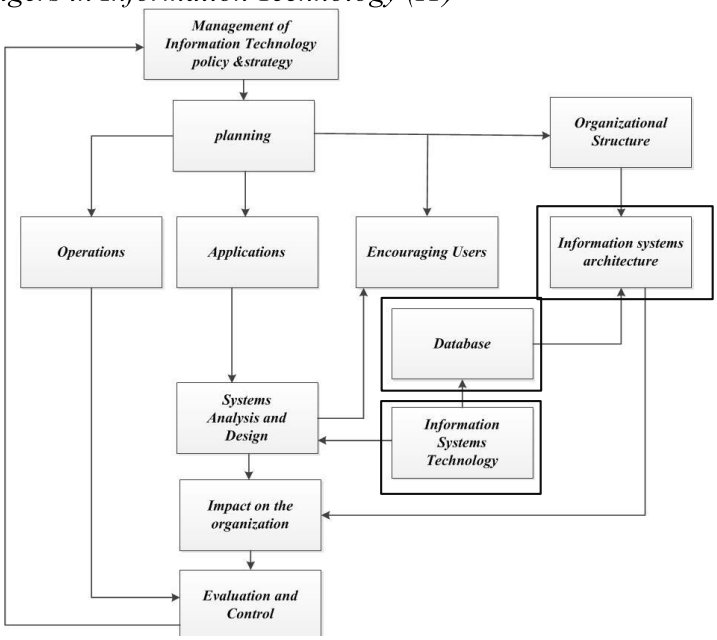
Course Description *(Continued..)*

- *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)

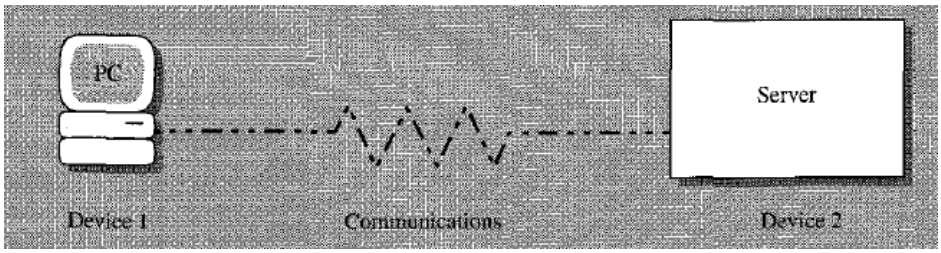


Information Technology

- *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

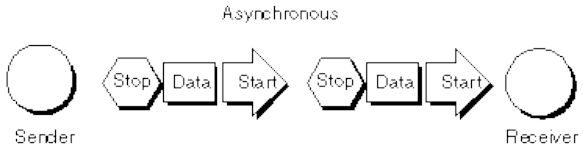
- *Communications*
  - *Communications between computers*
  - *The data sent over the line are represented as some type of code; that is, the sending and receiving ends of the communications lines have to agree on how to represent symbols*
  - *The most frequent code for interchanging data is called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

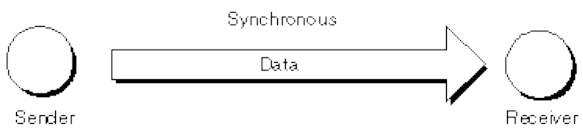
Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040		Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of 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

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*



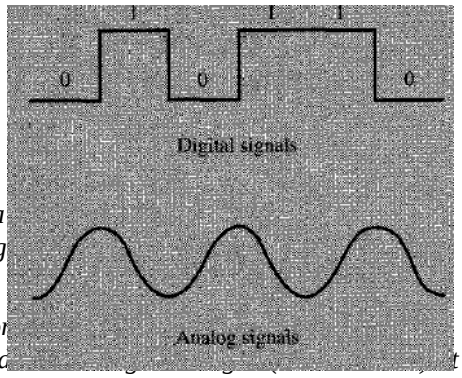


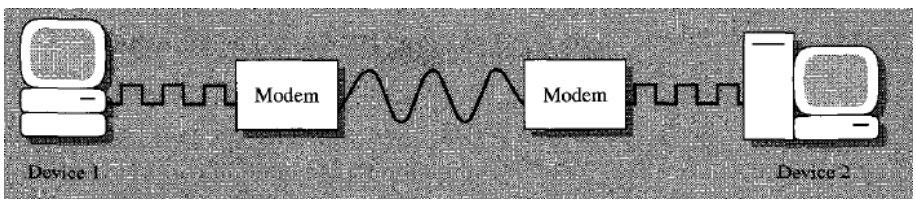
Information Technology

- *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.*

Information Technolog

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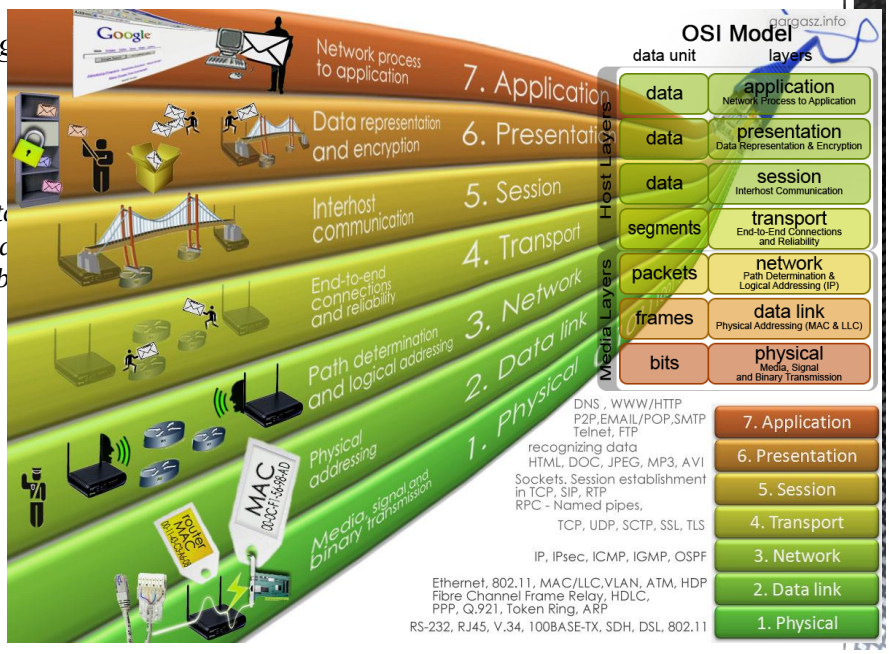

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