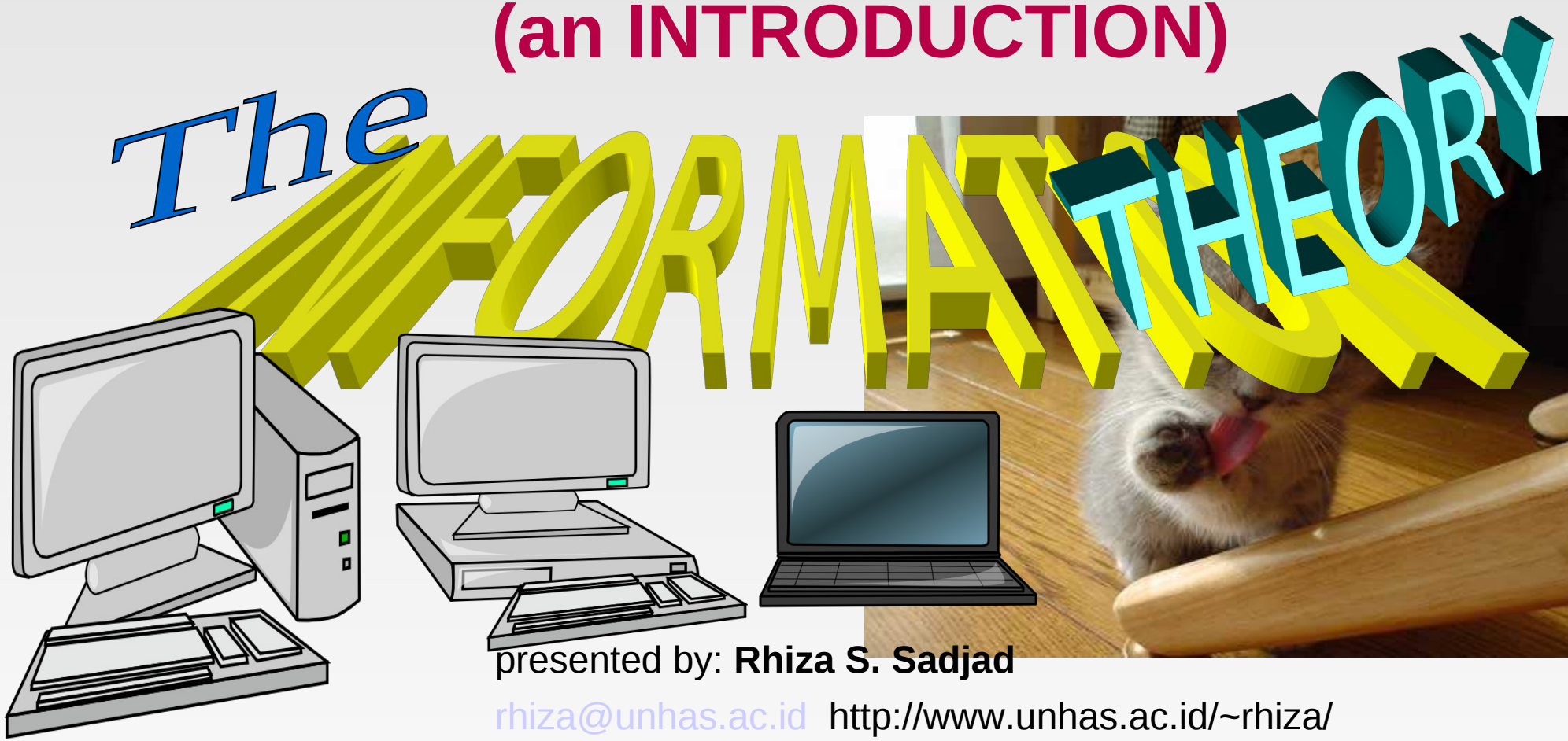
Information and Communication Technology:

The INFORMATION THEORY

(an INTRODUCTION)

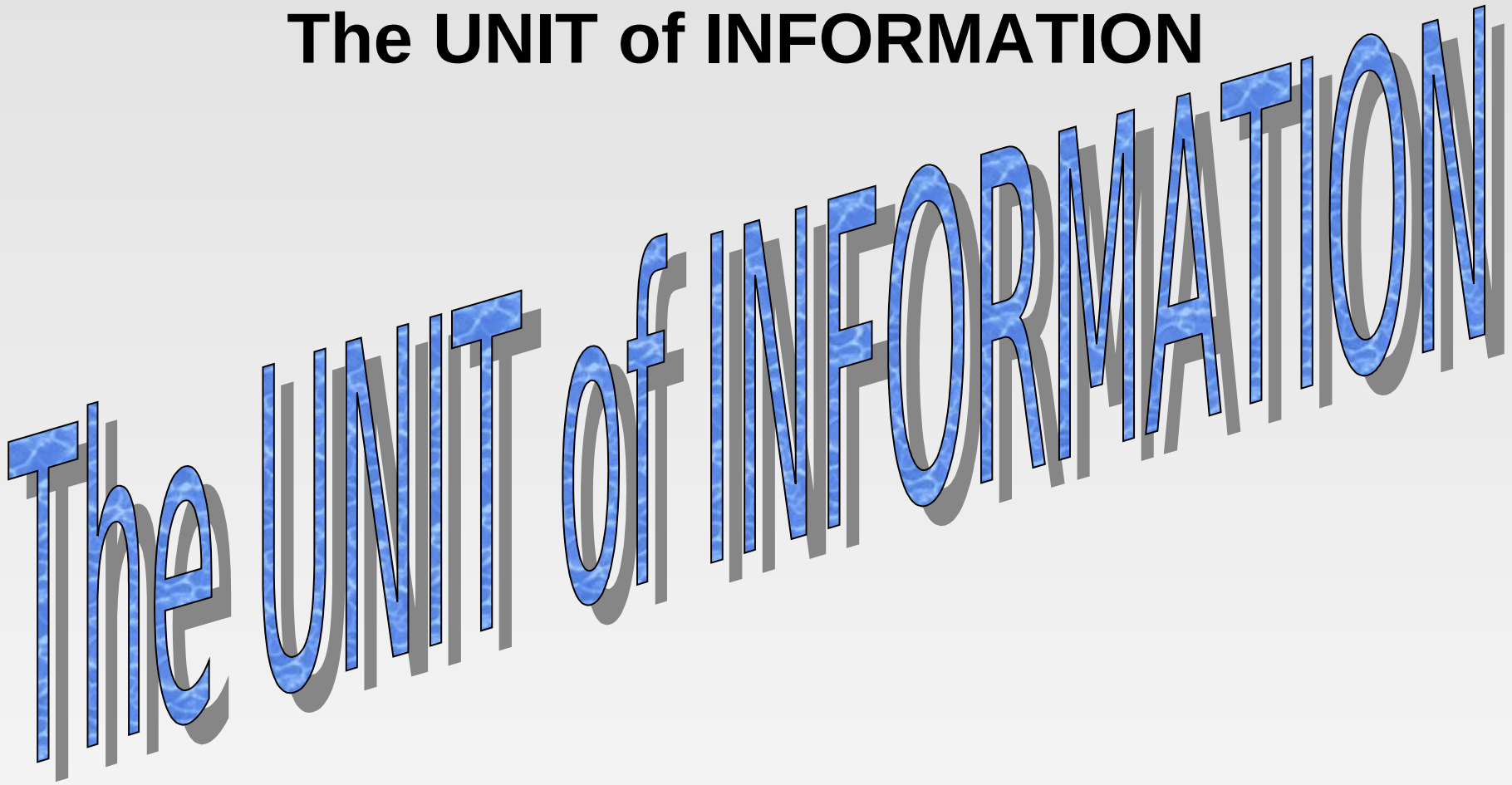


presented by: **Rhiza S. Sadjad**

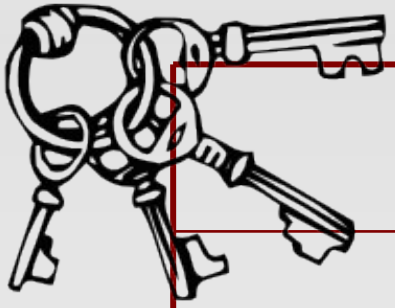
rhiza@unhas.ac.id http://www.unhas.ac.id/~rhiza/

Yet, another extended meaning of INFORMATION

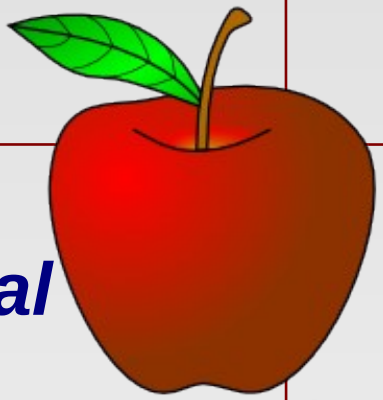
The UNIT of INFORMATION

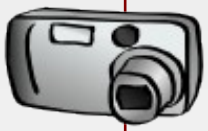


Key element/basic resource



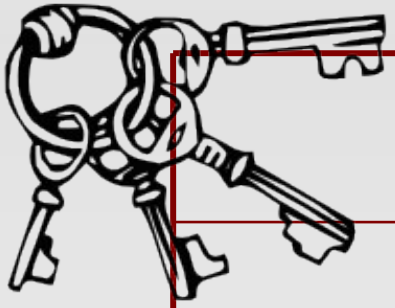
Society	Key element
Agricultural	FOOD
Industrial	ENERGY
Information	INFORMATION

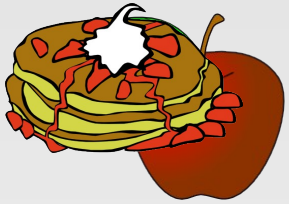


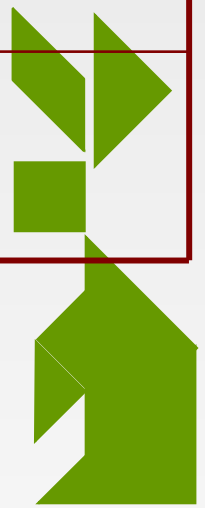


(Source: Everett M. Rogers, [**1986**], *“ Communication Technology ”*, page. 13)

Key element/basic resource



Key element	UNIT
FOOD 	kg, lbs, liter, oz .....
 ENERGY 	kWh, Joule, ...barrel
INFORMATION 	???????



The SMALLEST UNIT of INFORMATION

The SIMPLEST FORM of INFORMATION

YES	NO
RIGHT	WRONG
TRUE	FALSE
ON	OFF
WHITE	BLACK
TURN ON	SHUT DOWN
YES	NO
1	0

1 0

1 BIT
(Binary digIT)

The VALUE of an INFORMATION

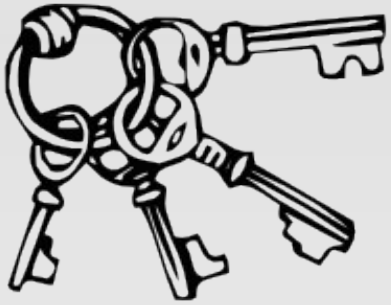
1 BIT =

YA	TIDAK
BENAR	SALAH
TRUE	FALSE
ON	OFF
HITAM	PUTIH
NYALA	PADAM
YES	NO

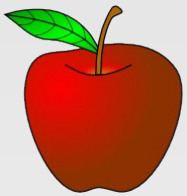
1 0

differs 2 things

The VALUE of an INFORMATION



2 BITs =
could differ 4 things



00

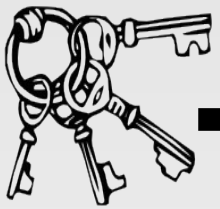
01

10

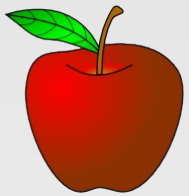
11

The VALUE of an INFORMATION

3 BITs = could differ up to 8 things



000



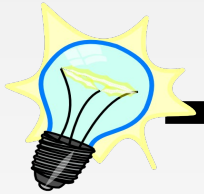
100

001

101

010

110



011

111

The VALUE of an INFORMATION

n BITs =

could differ up to 2^n things:

0000	0100	1000	1100
0001	0101	1001	1101
0010	0110	1010	1110
0011	0111	1011	1111

The VALUE of an INFORMATION

ASCII Code =

American Standard Code for Information Interchange

a b c d e ..... x y z

A B C D E F G H ..... X Y Z

0 1 2 3 4 5 6 7 8 9

~`!@#$%^&*()_-+=|\}]{["':;?/.<

All kinds of "character"

8 BIT codes

from **00000000**

up to **11111111**

examples

H = 01001000	**a = 01100001**
\ = 01011100	**b = 01100010**
h = 01101000	**Z = 01011010**

The VALUE of an INFORMATION

For example.....

How much information is in a 275-page book ????

How many characters???

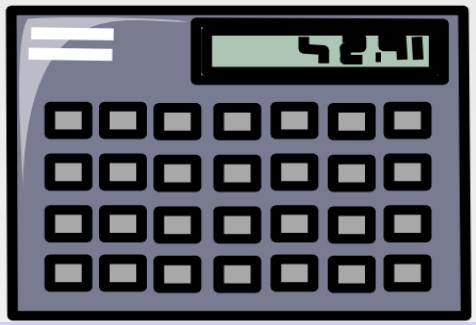
275 pages

X **40** lines/page in average

X **10** words/line in average

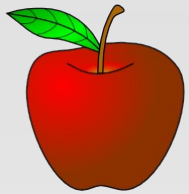
X **5** characters/word in average

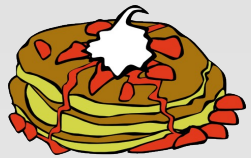
550.000 X 8 BIT



4.400.000 BIT

Larger units of INFORMATION


1000 bit → 1 Kilobit → 1 Kb

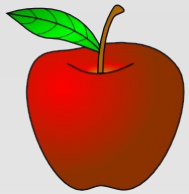
1000 Kb → 1 Megabit → 1 Mb

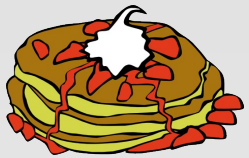
1000 Mb → 1 Gigabit → 1 Gb

1000 Gb → 1 Terrabit → 1 Tb

1 Byte → 1 B = 8 s/d 10 bit

Larger units of INFORMATION

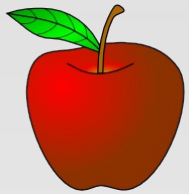



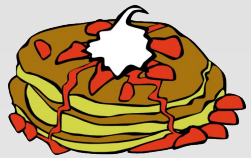




Example:

A flashdisk has a capacity of 8 Gb. How many e-books of 5.5 Mb can be stored in the flashdisk?

Larger units of INFORMATION


Answer:

The flashdisk has the capacity of 8 Gb = 8000 Mb. The e-book's "size" is 5.5 Mb. Thus, the flashdisk can be filled up to 8000/5.5 e-books, or around 1455 e-books ! (Compare to your bag, how many books can you store in it??? 5, 6, ... 10 books?)

NEXT

The Information Theory

The Information Theory

..... to be continued