



Information and Communication Technology:

The INFORMATION THEORY (an INTRODUCTION)

The INFORMATION THEORY



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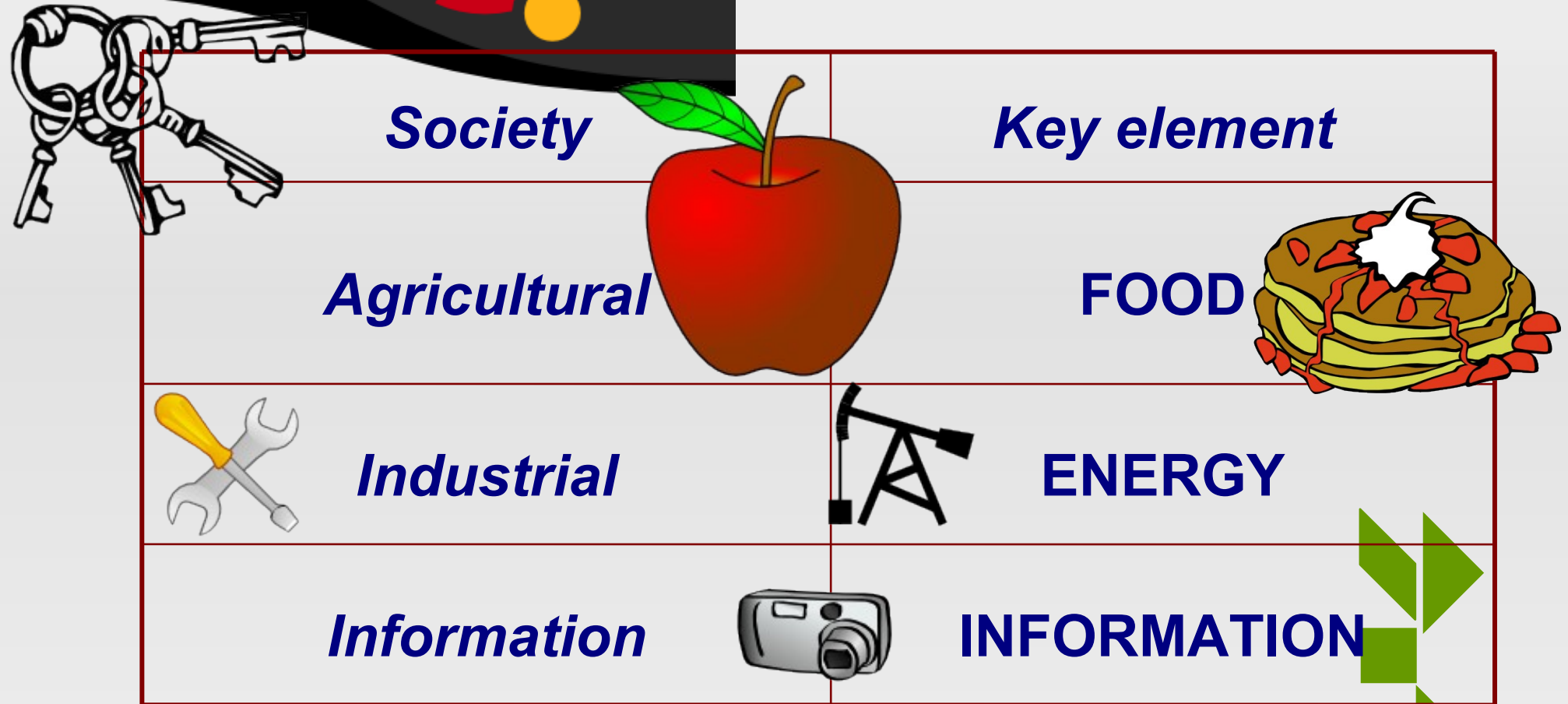


Yet, another extended meaning of
INFORMATION

The UNIT of INFORMATION

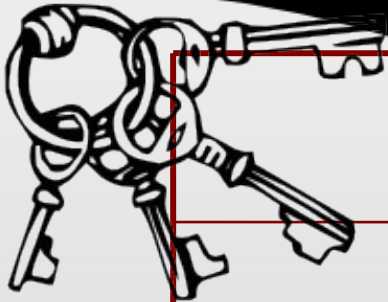
The UNIT of INFORMATION

Key element/basic resource



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

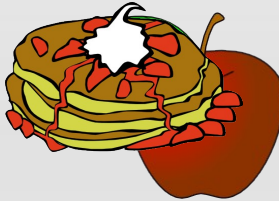
Key element/basic resource



Key element

UNIT

FOOD



kg, lbs, liter, oz



ENERGY

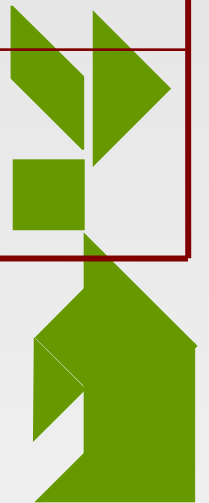


kWh, Joule,barrel

INFORMATION



????????



The SMALLEST UNIT of INFORMATION



will you marry me...???

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 =

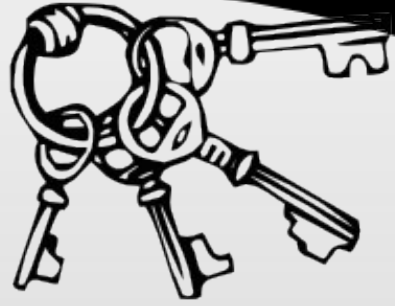
YA	TIDAK
BENAR	SALAH
TRUE	FALSE
ON	OFF
HITAM	PUTIH
NYALA	PADAM
YES	NO

1 0

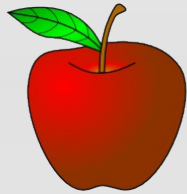
differs 2 things



The *VALUE* of an *INFORMATION*



2 BITS =
could differ 4 things



→ 00



→ 01



→ 10

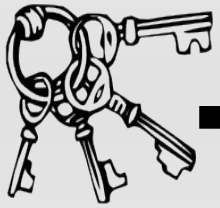


→ 11

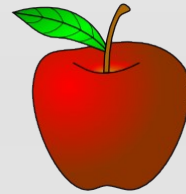


The *VALUE* of an *INFORMATION*

3 BITS $\equiv$ could differ up to 8 things



→ 000



→ 100



→ 001



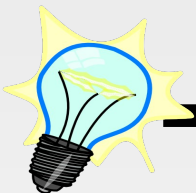
→ 101



→ 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

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???

550.000

X

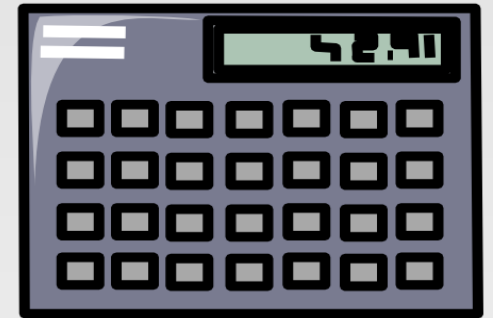
8 BIT

275 pages

X 40 lines/page in average

X 10 words/line in average

X 5 characters/word in average



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

