

what is information?

info-20002: foundations of informatics

What is information?

The word information derives from the Latin informare (in + formare), meaning to give form, shape, or character to. It is therefore to be the formative principle of, or to imbue with some specific character or quality.

P. Young (1987). The Nature of Information.

von Baeyer, H. C. (2003). Information: The New Language of Science. Chapter 3.

What is information?

In Oxford English Dictionary:

- From: “a teaching; an instruction; a piece of advice” ...
- To:
 1. "As a mathematically defined quantity divorced from any concept of news or meaning ...; spec. one which represents the degree of choice exercised in the selection or formation of one particular symbol, message, etc., out of a number of possible ones, and which is defined logarithmically in terms of the statistical probabilities of occurrence of the symbol or the elements of the message." (def. 2c)
 2. "Contrasted with data: that which is obtained by the processing of data." (def. 2d)

[1] Gleick, J. [The Information Palace](#)

[2] OED, [information](#)

Information in and out of context

- OED #1: Information as a fact

Mathematically defined quantity, Shannon's bits, out-of-context [1]. There is no distinction of values between:

- "4566 7450 2344 1935 AMEX 08/17"
- "I am floating like a butterfly"

- OED #2: Information as a subjective entity

Data is raw facts; information is processed data, within organisations, in a social context.

"A pragmatic definition defines the topic as the most valuable form of content in a continuum starting at *data*, encompassing *information*, and ending at *knowledge*." [2]

[1] Shannon, C. (1948). [A Mathematical Theory of Communication](#), Bell System Technical Journal (27)

[2] Grover, V., Davenport, T. H., [General Perspectives on Knowledge Management: Fostering a Research Agenda](#), J. of Management Information Systems (18)1



Alan Turing - Celebrating the life of a genius

from **Cambridge University** PLUS

08:13

HD

[Alan Turing - Celebrating the life of a genius](#) from [Cambridge University](#) on [Vimeo](#).

The original Enigma ciphertext

NCZW	VUSX	PNYM	INHZ	XMQX
SFWX	WLKJ	AHSH	NMCO	CCAK
UQPM	KCSM	HKSE	INJU	SBLK
IOSX	CKUB	HMLL	XCSJ	USRR
DVKO	HULX	WCCB	GVLI	YXEO
AHXR	HKKF	VDRE	WEZL	XOBA
FGYU	JQUK	GRTV	UKAM	EURB
VEKS	UHHV	OYHA	BCJW	MAKL
FKLM	YFVN	RIZR	VVRT	KOFD
ANJM	OLBG	FFLE	OPRG	TFLV
RHOW	OPBE	KVWM	UQFM	PWPA
	RMFH	AGKX	IIBG	

[1] [Stefan Krah's M4 project](#)

The decrypted text (plain text)

VONV	ONJL	OOKS	JHFF	TTTE
INSE	INSD	REIZ	WOYY	QNNS
NEUN	INHA	LTXX	BEIA	NGRI
FFUN	TERW	ASSE	RGED	RUEC
KTYW	ABOS	XLET	ZTER	GEGN
ERST	ANDN	ULAC	HTDR	EINU
LUHR	MARQ	UANT	ONJO	TANE
UNAC	HTSE	YHSD	REIY	ZWOZ
WONU	LGRA	DYAC	HTSM	YSTO
SSEN	ACHX	EKNS	VIER	MBFA
ELLT	YNNN	NNNO	OOVI	ERYS
	ICHT	EINS	NULL	

[1] [Stefan Krah's M4 project](#)

The decrypted text rearranged

VON VON JLOOKSJ HFFTTT EINS EINS DREI ZWO YY QNNS NEUN
INHALT XX BEI ANGRIFFF UNTER WASSER GEDRUECKT Y WABOS X
LETZTER GEGNERSTAND NUL ACHT DREI NUL UHR
MARQU ANTON JOTA NEUN ACHT SEYHS DREI Y
ZWO ZWO NUL GRAD Y ACHT SM Y STOSSE NACH X
EKNS VIER MB FAELLT Y NNN NNN OOO VIER Y SICHT EINS NULL

[1] [Stefan Krah's M4 project](#)

After clean up, normalise abbreviations and numbers

Von Looks: Funktelegramm 1132/19

Inhalt:

Bei Angriff unter Wasser gedrueckt, Wasserbomben.

Letzter Gegnerstandort 08:30 Uhr,

Marine Quadrat AJ 9863, 220 Grad, 8 Seemeilen, stosse nach.

14 Millibar faellt, NNO 4, Sicht 10.

[1] [Stefan Krah's M4 project](#)

English translation

From Looks: Radio signal 1132/19

Contents:

Forced to submerge during attack, depth charges.

Last enemy location 08:30h, Naval Grid AJ 9863,
220 degrees, 8 nautical miles, (I am) following (the enemy).
(Barometer) 1014 Millibar (tendency) falling,
North North East 4, visibility 10.

[1] [Stefan Krah's M4 project](#)

Chain of Information

- Encoded Text (Morse Code)
- Encrypted Text (Enigma Code)
- Decrypted Text (German raw)
- Post-processed Text (German clean)
- Translated Text (English plain text)

Chain of Information

- Encoded Text (Morse Code)
- Encrypted Text (Enigma Code) ← Cryptanalysis
- Decrypted Text (German raw) ← Linguistic
- Post-processed Text (German clean) ← Multilingual
- Translated Text (English plain text) ← Social Context



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Ackoff, R. (1989). **"From Data to Wisdom"**. J. of Applied Systems Analysis 16: 3–9

Rowley, J. (2007). **"The wisdom hierarchy: representations of the DIKW hierarchy"**. J. of Inf. Science, 33: 163-180

Zins, C. (2007). **"Conceptual Approaches for Defining Data, Information, and Knowledge"**. J. of the American Society for Information Science and Technology, 58 (4): 479–493.

Data, Information, Knowledge, Wisdom

- Data: know nothing (symbols)
- Information: know what, who, when, where (processed data)
- Knowledge: know how (actionable information)
- Wisdom: know why (evaluated understanding)

M. Zeleny (1987). "Management support systems: towards integrated knowledge management". Human Systems Management 7(1): 59–70