

TEKNOLOGI INFORMASI



GEOGRAPHY AND TECHNOLOGY

G. Kono, K. Higuchi, and M.F. Higuchi
Hawaii Geographic Alliance 1999



Oh no, time to wake up
Turn off the alarm clock
Turn on the light
Listen to some tunes
All the electricity I just used,
Was geography and technology.

Geography and technology
World of your community
Geography and technology
See how the world comes to you
Geography and technology

Hurry up it's time to eat
All I want is some fruit and meat
Fruit comes from trees need water
too,
Using water true and blue.
GIS helped plan this you see,
To map and plan our community.

Geography and technology
World of your community
Geography and technology
See how the world comes to you
Geography and technology

Time to go, I'm so full.
Let the sing grind the food.
It does down the sewer system,
To be part of the waste water system.
All of this was planned with,
Geography and Technology

Geography and technology
World of your community
Geography and Technology
See how the world comes to you
Geography and technology

Jump in the car,
It's not so far,
Don't we need some gas
To go a little fast,
Did you guess, GIS
Helped in planning this the best

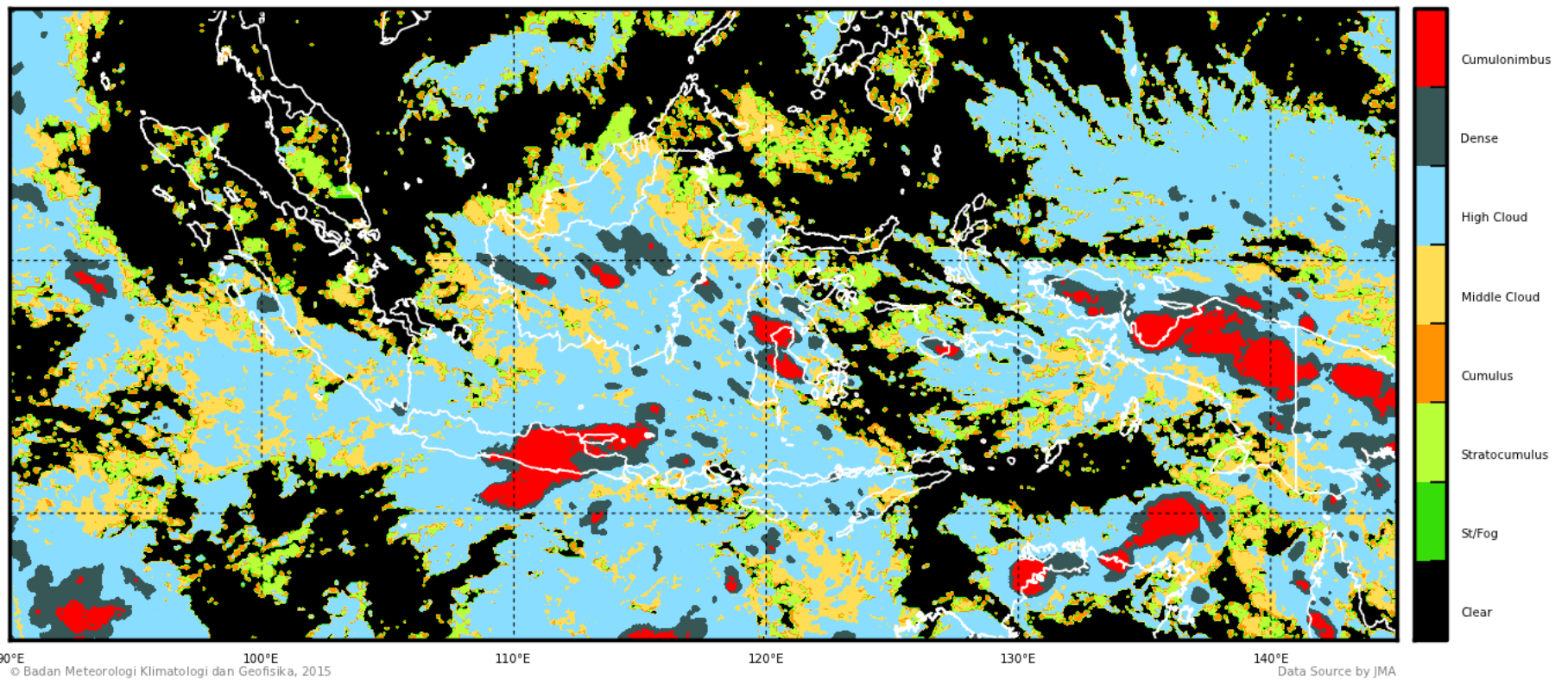
Geography and technology
World of your community
Geography and technology
See how the world comes to you
Geography and technology

Grab my papers and my books
Textbooks, notebooks, library books.
Even other things you use,
Pencils, magazines, and newspapers too.
The wood that made the paper and
goods,
Used geography and technology.
The world and community you see,
See how the world comes to you and me,
Through geography and technology.

Cloud Type

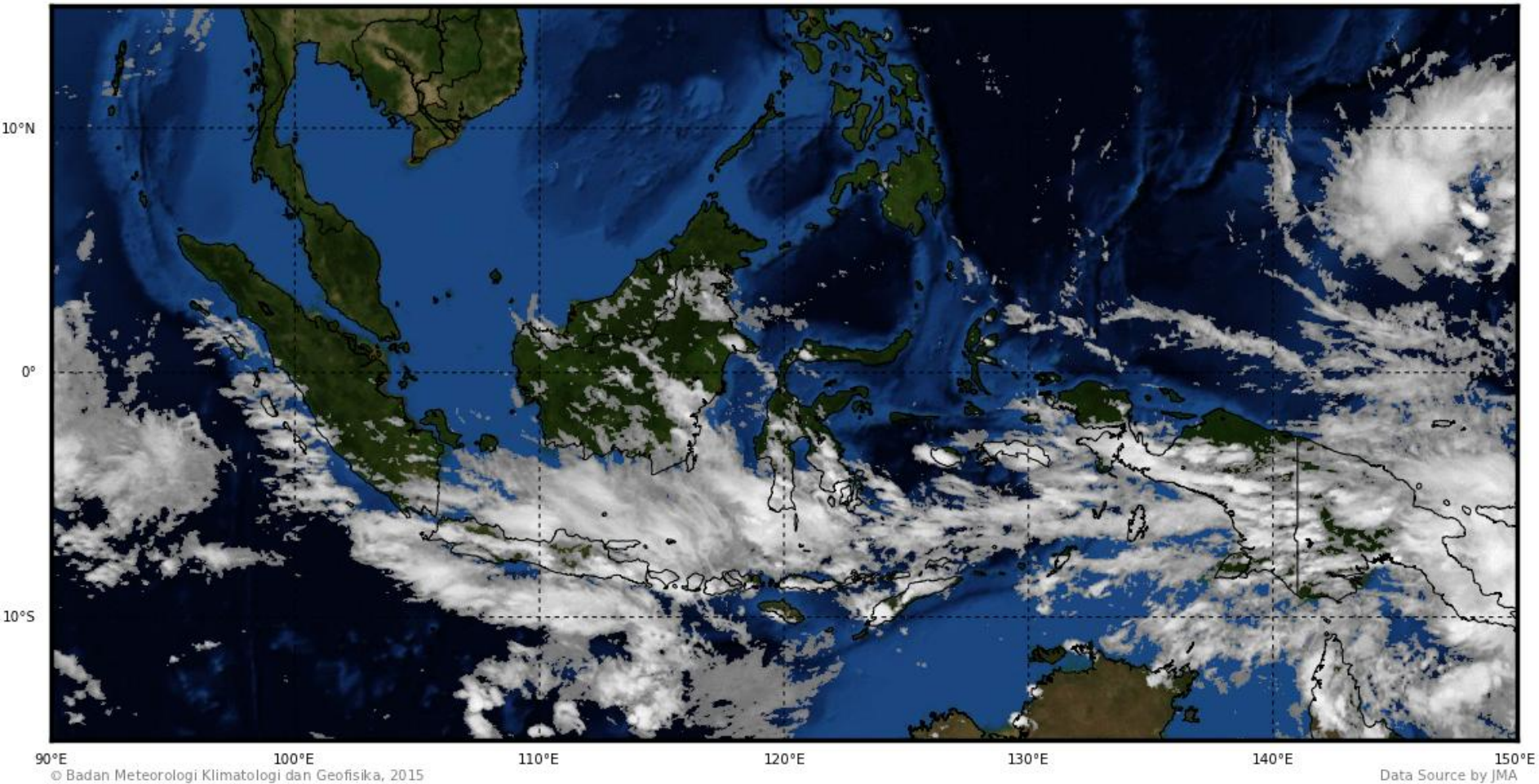
2015-02-11 : 13 UTC

Type



MTSAT Cloud

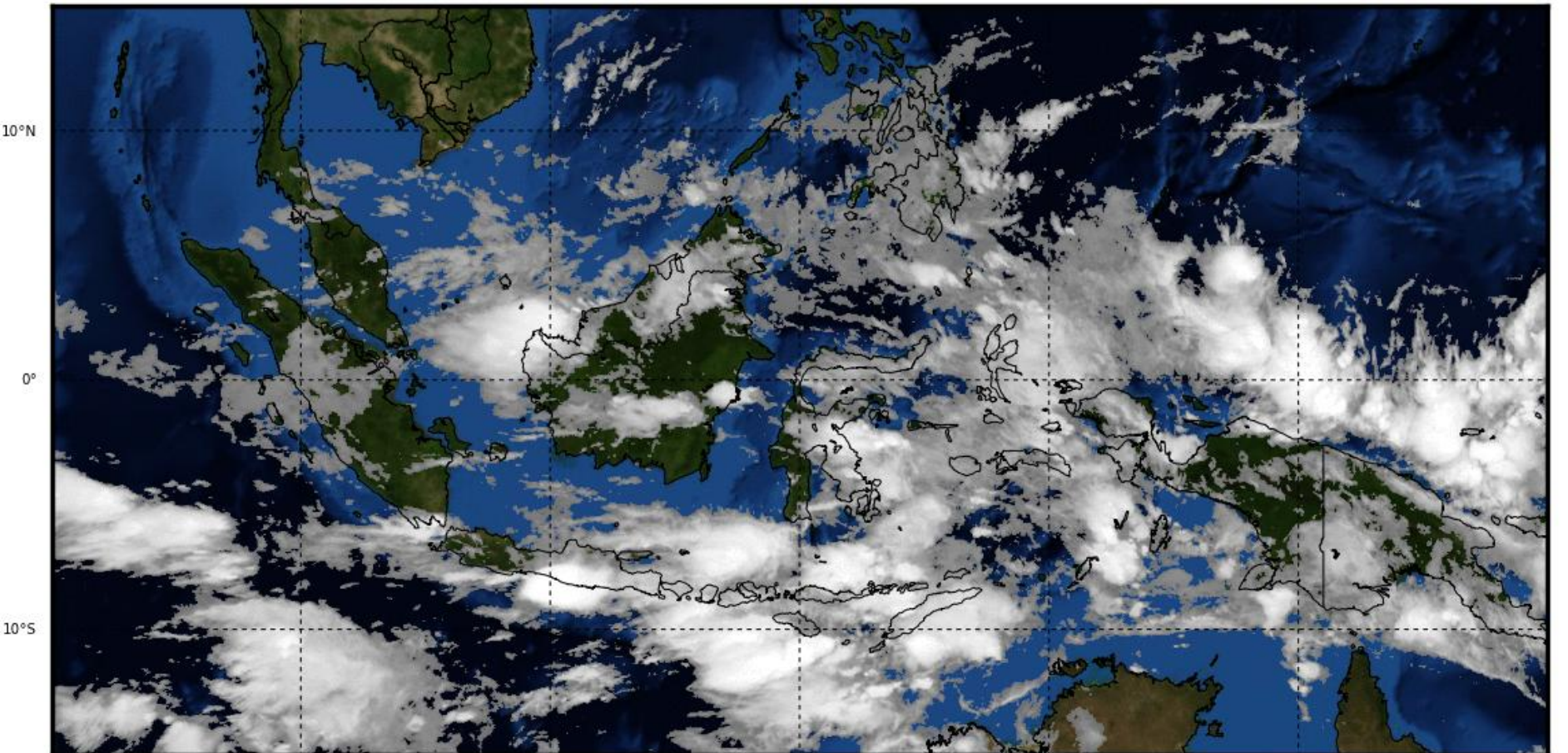
2015-02-12 : 14 WIB



Saat Hujan Abu G. Kelud

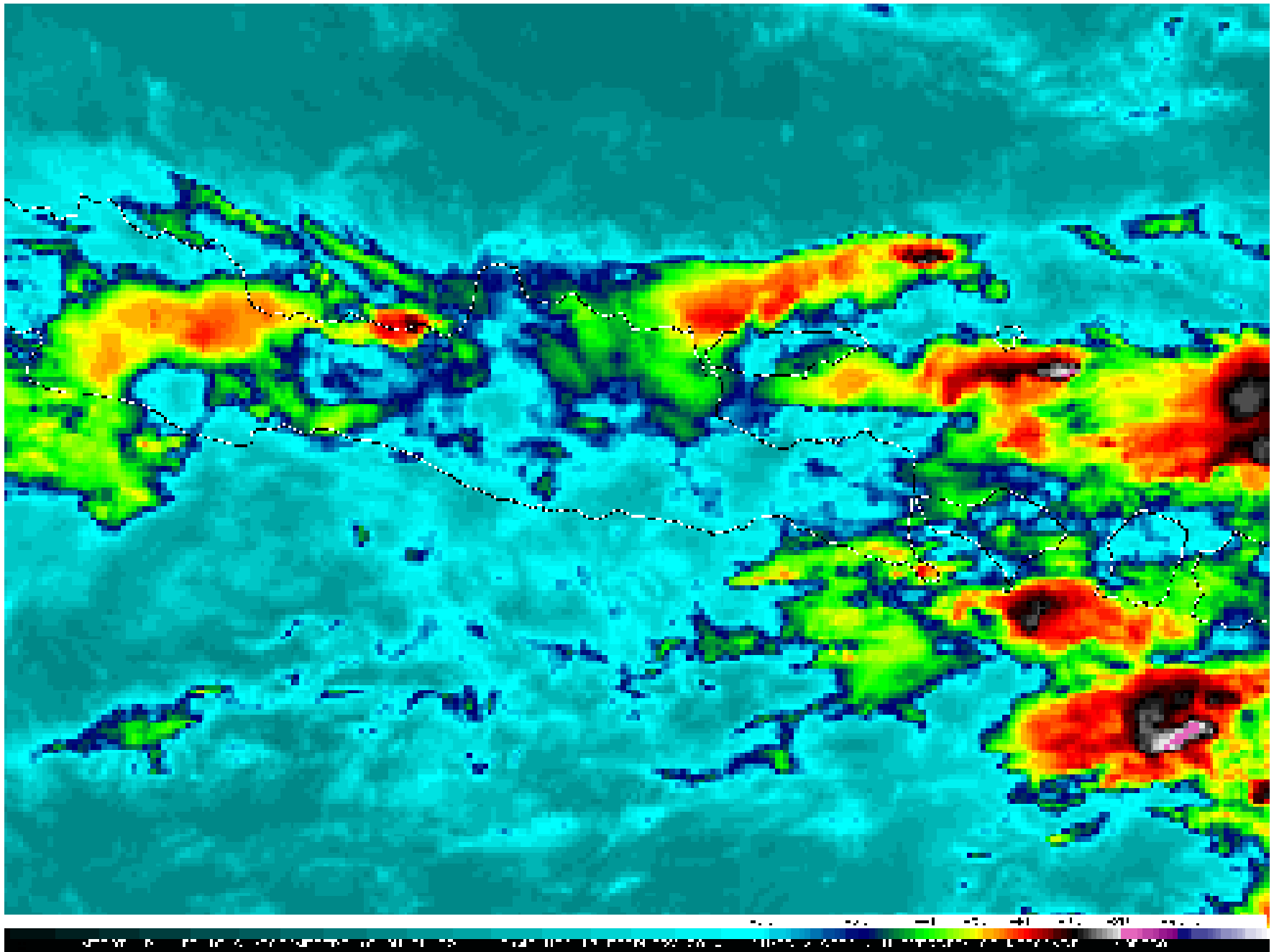
MTSAT Cloud

2014-02-14 : 03 WIB



90°E 100°E 110°E 120°E 130°E 140°E 150°E
© Badan Meteorologi Klimatologi dan Geofisika, 2014

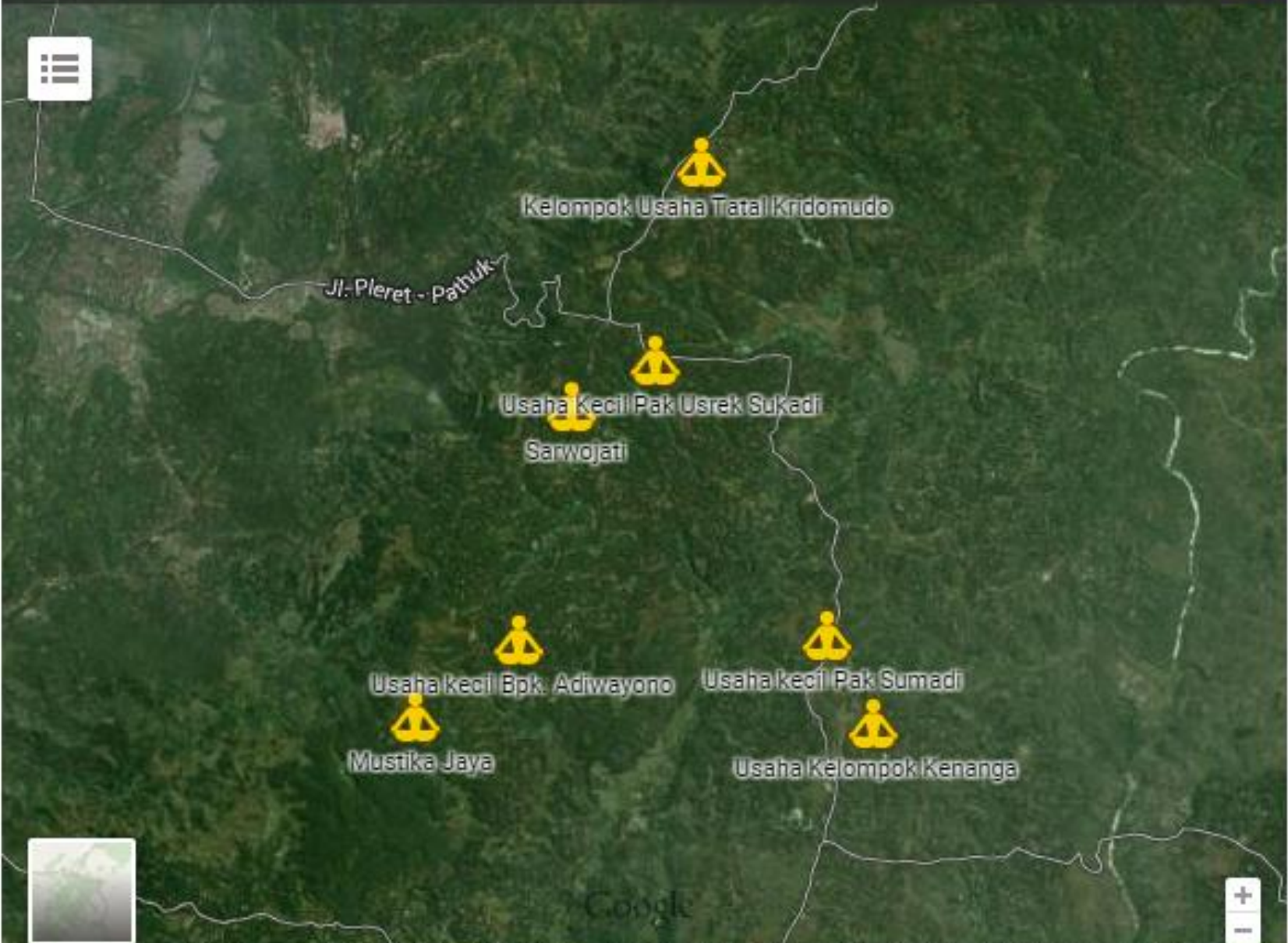
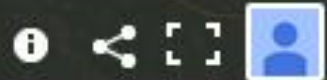
Data Source by JMA



Letusan dari menit ke menit dari Satelit

<http://rovicky.wordpress.com/>

Peta Persebaran Industri Kerajinan Tangan di Kabupaten Bantul



Kelompok Usaha Tatal Kridomudo

Jl. Pleret - Patuk

Usaha Kecil Pak Usrek Sukadi
Sarwojati

Usaha kecil Bpk. Adiwayono

Usaha kecil Pak Sumadi

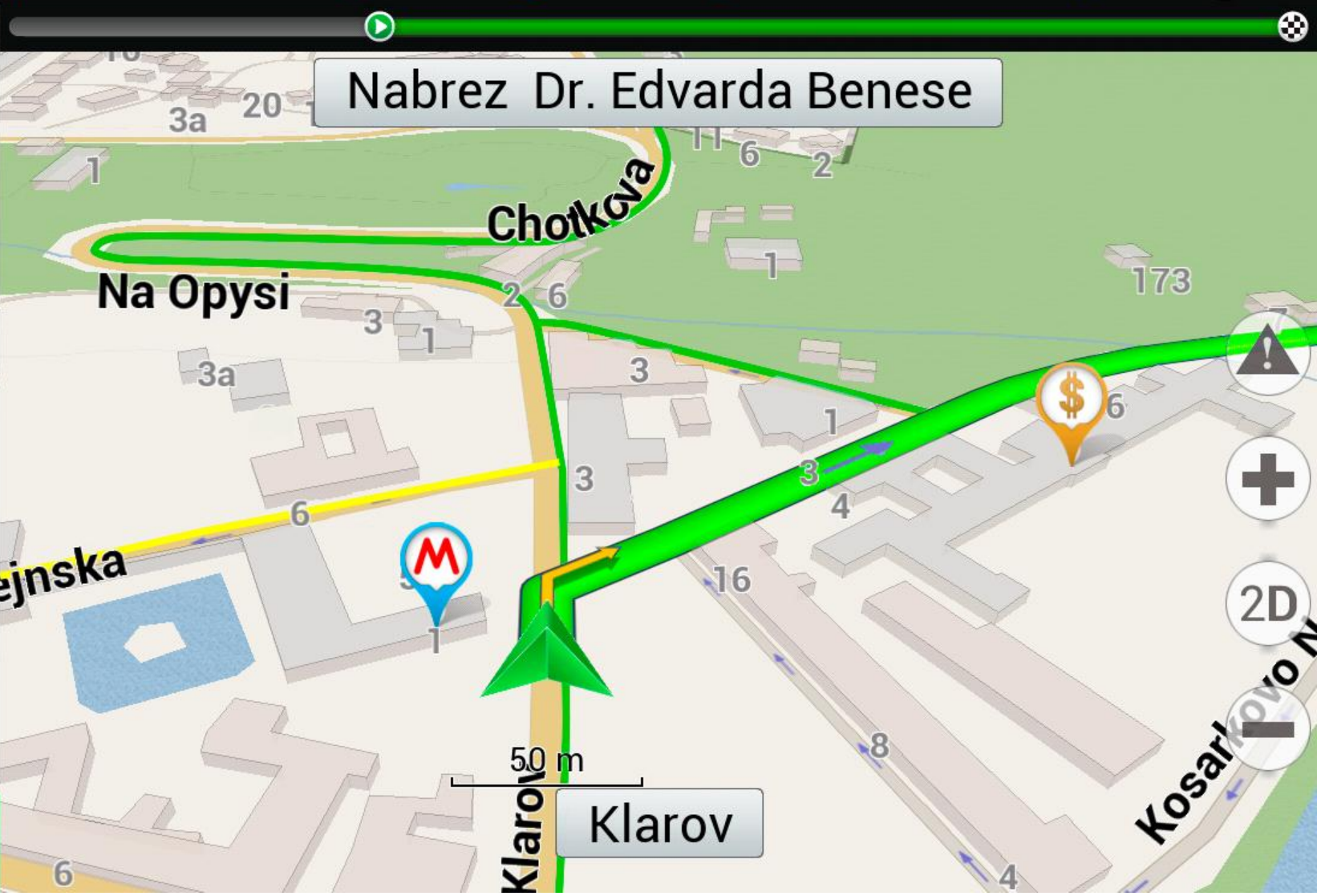
Mustika Jaya

Usaha Kelompok Kenanga

Google

Navigation sidebar with a yellow arrow pointing up and right. It contains the following information:

- 40 m
- 40 km/h
- Time left: 0:03
- Distance: 1.6 km
- Arrival time: 11:00
- Menu button



Map navigation controls on the right side:

- Warning icon (triangle with exclamation mark)
- Zoom in icon (+)
- 2D/3D toggle icon
- Map style icon (rectangle with vertical lines)



Mia arrived at school



George Washington High School

600 32nd Avenue
San Francisco, CA 94121, United States

Arrived 12 seconds ago

Edit Alerts

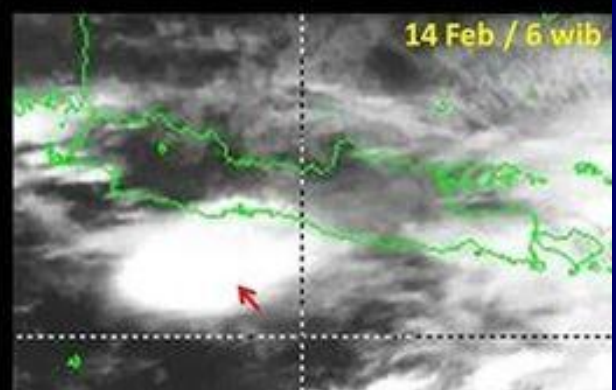
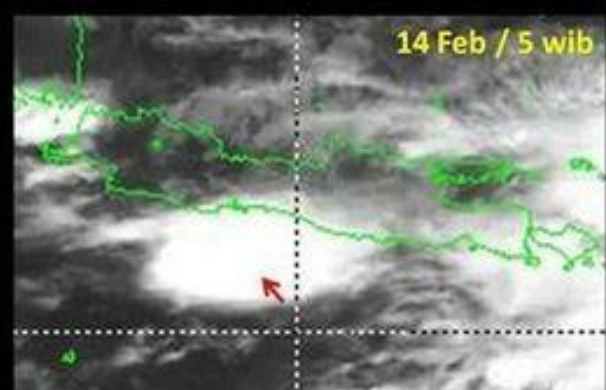
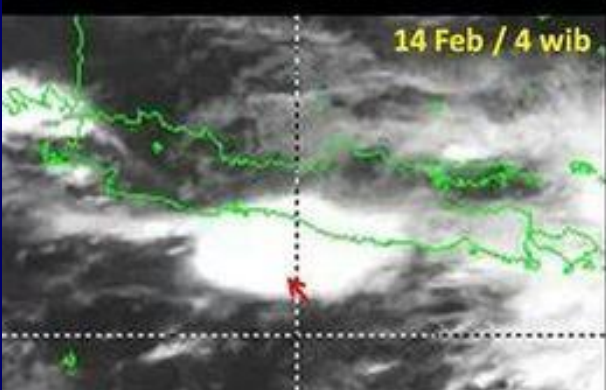
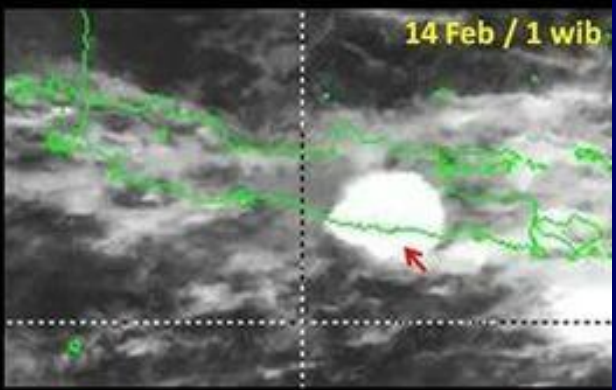
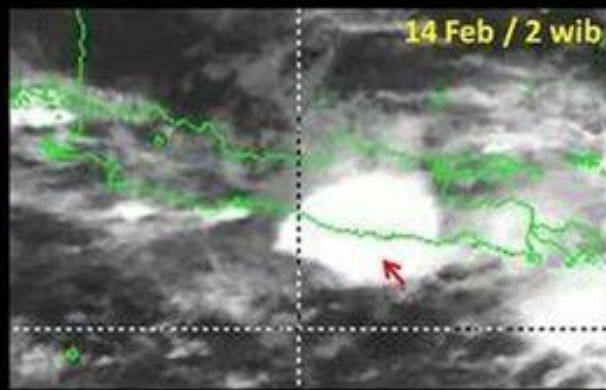
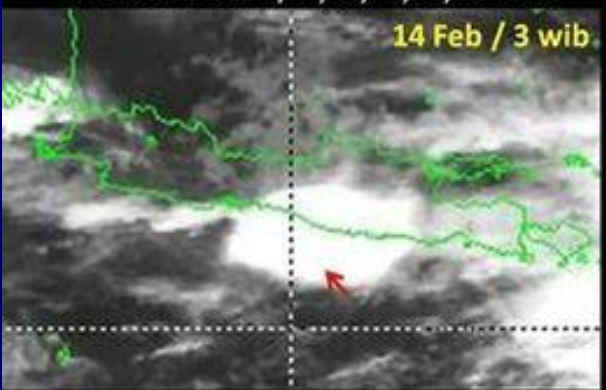
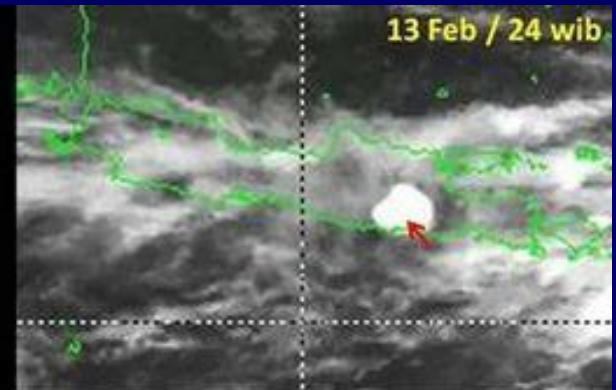
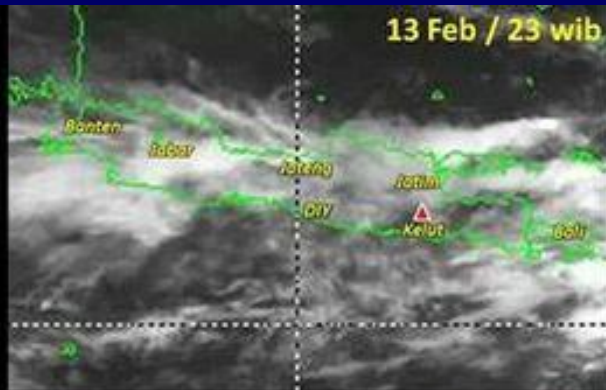
OK



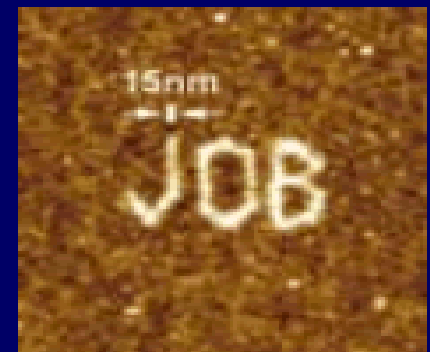
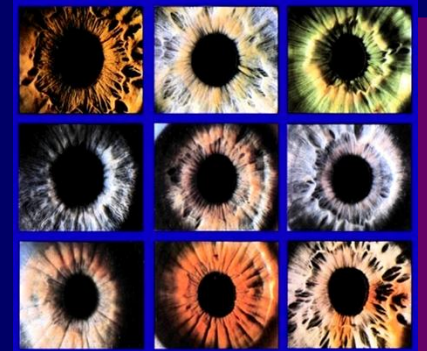
Sebaran Debu Vulkanik Letusan Gunung Kelud

Kamis 13 Feb 2014 pkl. 22.50 WIB

Citra Satelit Cuaca Himawari-7
13 Feb Pkl. 23, 24 wib
14 Feb Pkl. 1, 2, 3, 4, 5, 6 wib



- “**Geo-technology**, as one of the three most important emerging and evolving fields, along with **nanotechnology** and **biotechnology**” (2004, Gewin, Nature)。



Esensi Informasi dan Teknologi Informasi

Informasi telah menjadi menjadi ciri dunia modern, terutama karena:

- Pemanfaatan informasi di bidang ekonomi dan sosio-politik
- Perkembangan teknologi informasi untuk mendukung proses penciptaan, analisis, penyimpanan, pengkomunikasian, dan penyebaran informasi



Evolusi Abad Informasi

1. ABAD PERTANIAN (Sebelum 1957)

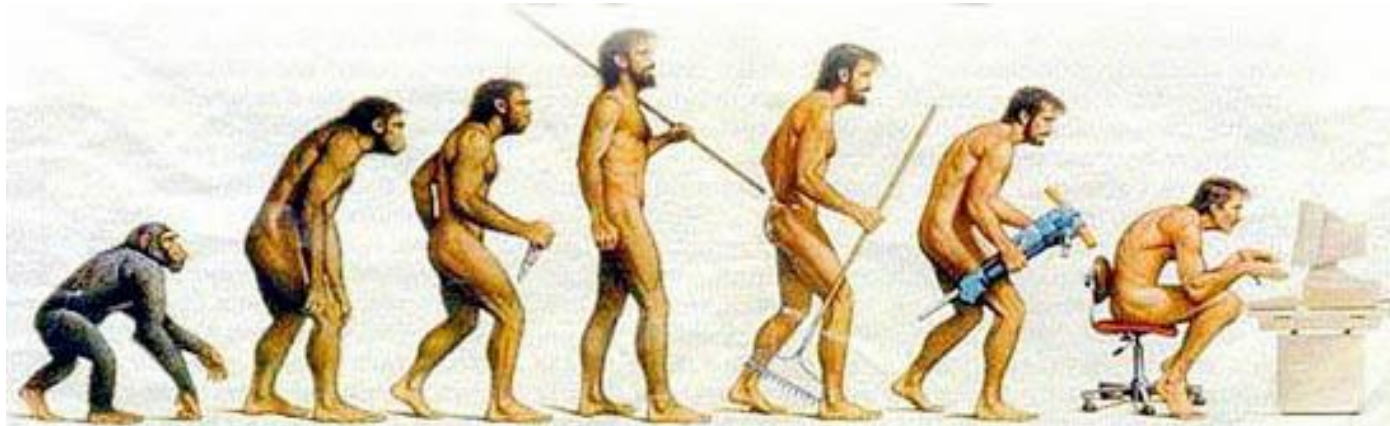
dimana pada masa manusia masih dominan bercocok taman informasi masih bergantung kepada kekuatan tangan manusia

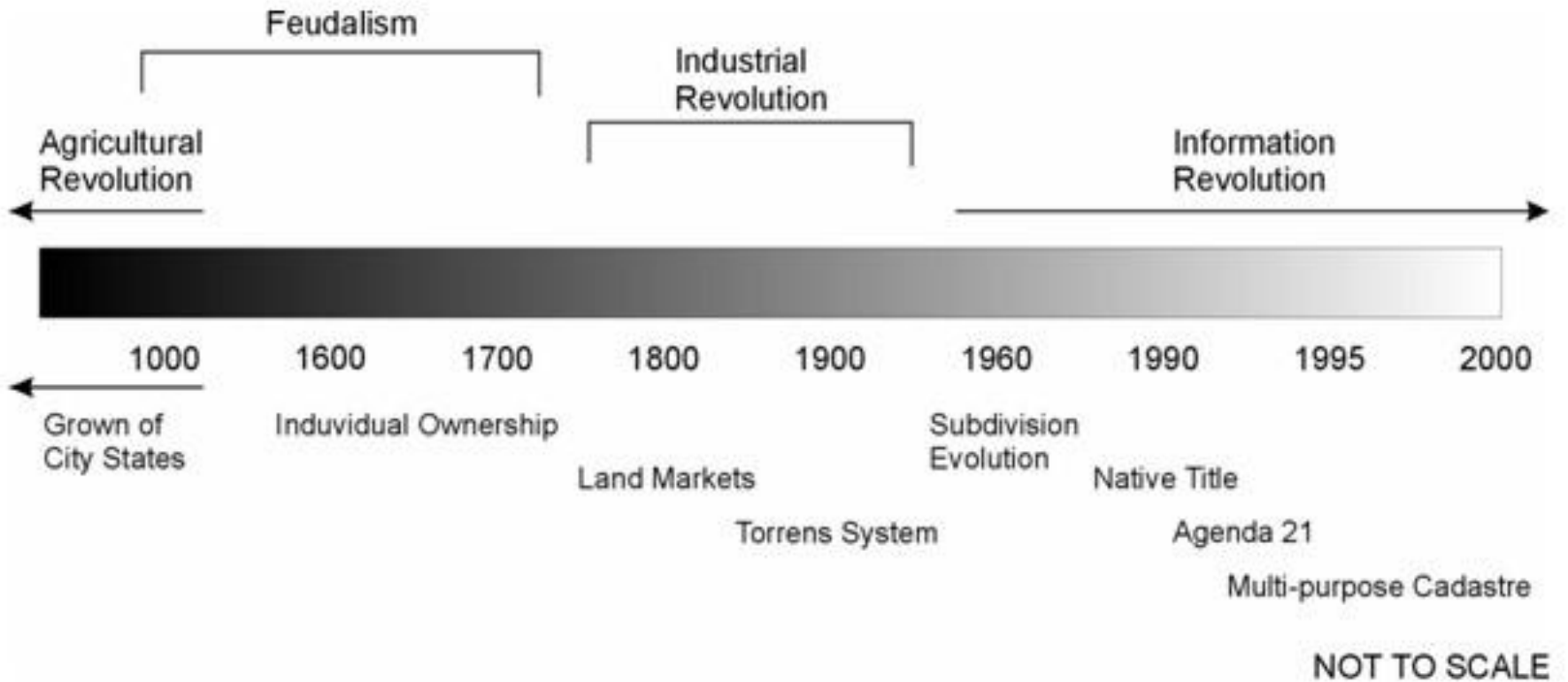
2. ABAD INDUSTRI (1800-1957)

manusia sudah banyak yang bekerja di pabrik (akibat dari revolusi Inggris dimana informasi sudah mengandalkan mesin walaupun masih harus dikendalikan oleh tangan manusia.

3. ABAD INFORMASI (1957-Sekarang)

informasi sudah jauh lebih mudah dan praktis.





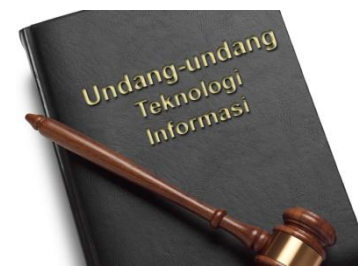
Evolution of people to land relationship. (Ting and others, 1999)

TI (teknologi informasi) = IT (*information technology*) = infotech = Telematika.

Teknologi Informasi

adalah suatu teknik untuk mengumpulkan, menyiapkan, menyimpan, memproses, mengumumkan, menganalisis, dan/atau menyebarkan informasi.

UNDANG-UNDANG REPUBLIK INDONESIA NOMOR 11 TAHUN
2008 TENTANG INFORMASI DAN TRANSAKSI ELEKTRONIK



Teknologi Informasi dan Komunikasi (TIK) = Teknologi Informasi + Teknologi Komunikasi

dimana :

Teknologi Informasi = segala hal yang berkaitan dengan proses, penggunaan sebagai alat bantu, manipulasi, dan pengelolaan informasi.

Teknologi Komunikasi = segala hal yang berkaitan dengan penggunaan alat bantu untuk memproses dan mentransfer data dari perangkat yang satu ke lainnya.

TIK =

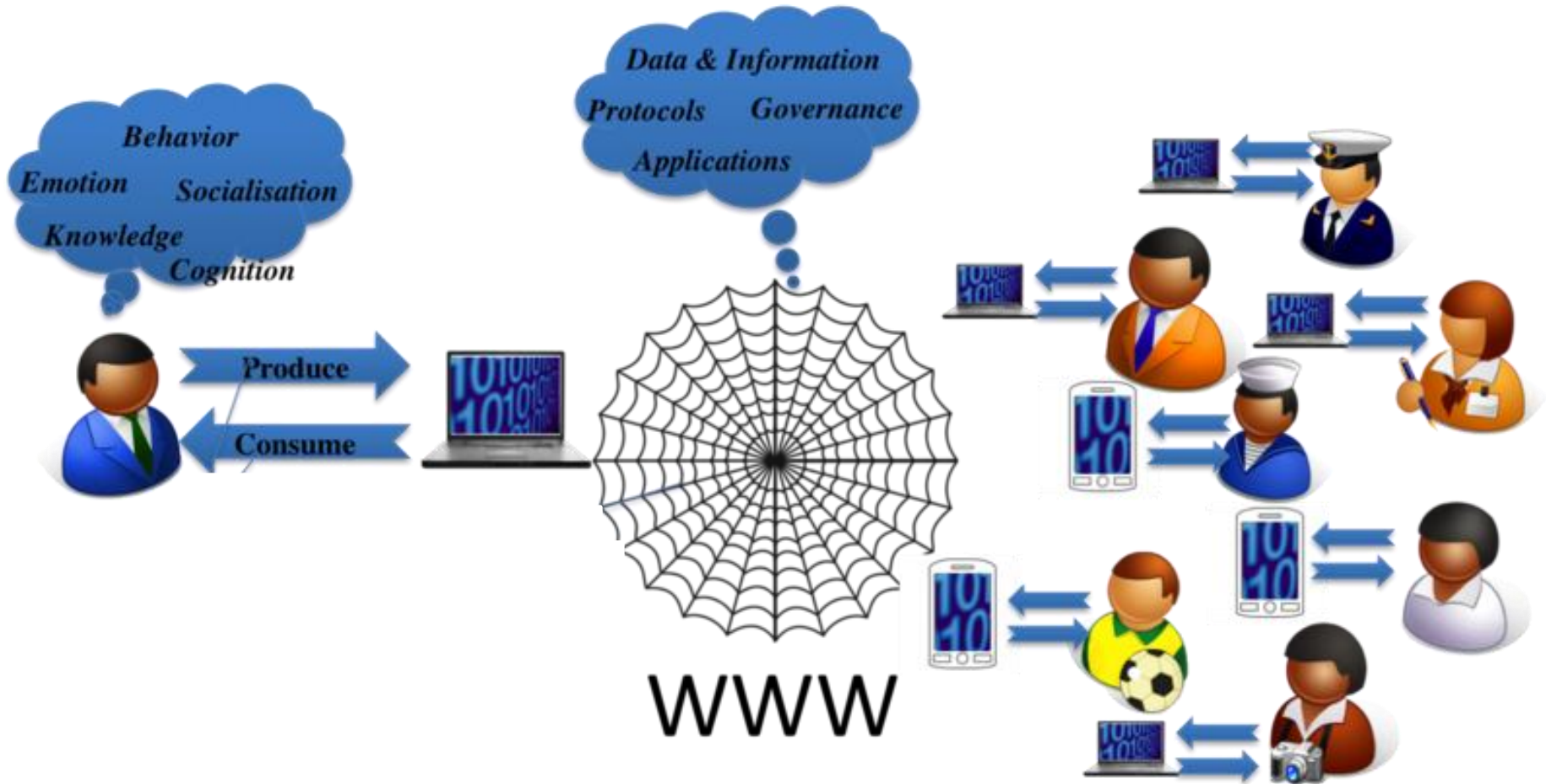
segala kegiatan yang terkait dengan pemrosesan, manipulasi, pengelolaan, dan transfer/pemindahan informasi antar media

(Puskur Diknas)

Profesional komputer sering disebut sebagai **pakar IT** atau **Business Process Consultants**,

Pada pembagian di sebuah perusahaan atau universitas yang berkaitan dengan teknologi perangkat lunak sering disebut **Departemen TI**.

Selama beberapa tahun terakhir, telah menjadi jauh lebih mudah bagi orang-orang di Indonesia (dan banyak negara yang sama) untuk **online**.



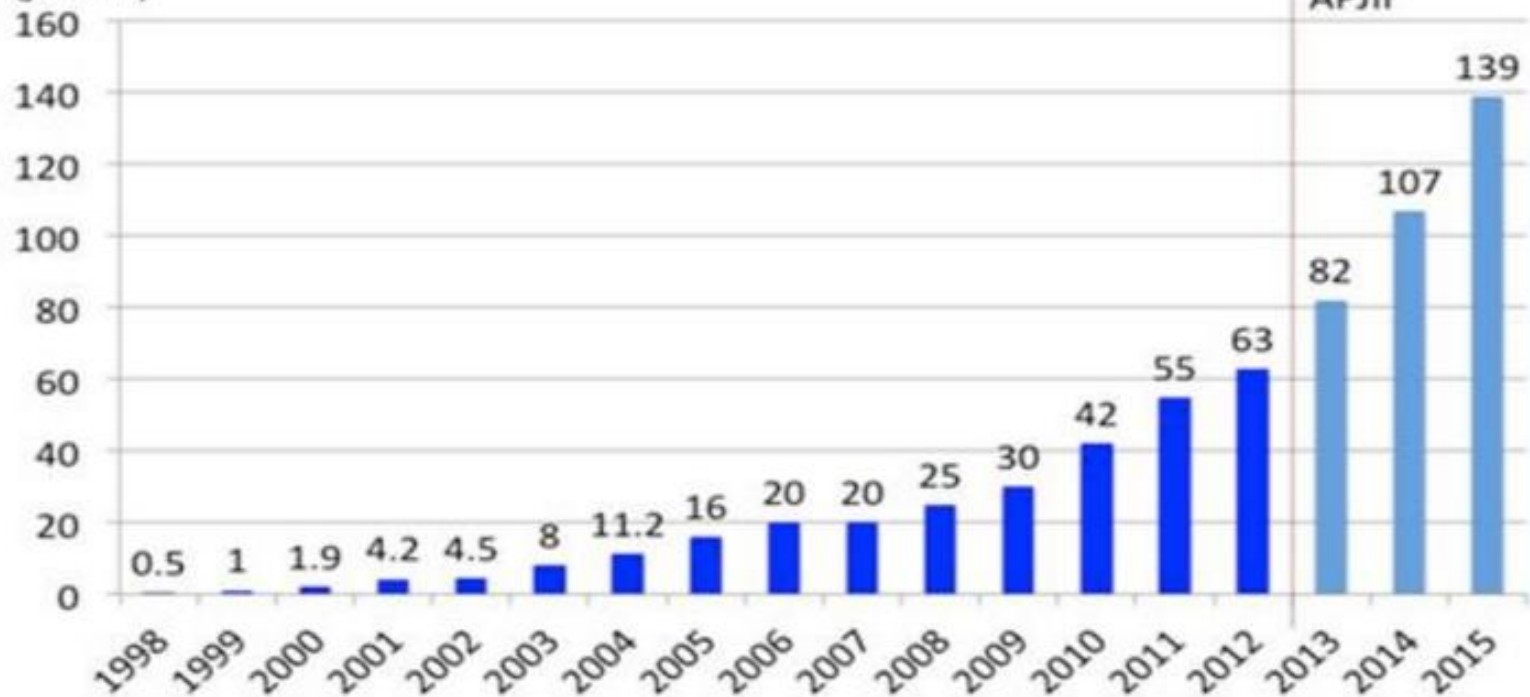
(cc-attrib Steffen Staab,
<http://west.uni-koblenz.de>)

Biaya komputer dan koneksi internet relatif telah turun secara signifikan, dan akses internet gratis sekarang tersedia di banyak perpustakaan, pusat-pusat komunitas dan ruang sosial.

Indonesia Internet Users



(jutaan)



DEMOGRAFI PENGGUNA INTERNET INDONESIA

JUMLAH PENGGUNA INTERNET DI INDONESIA BERTAMBAH

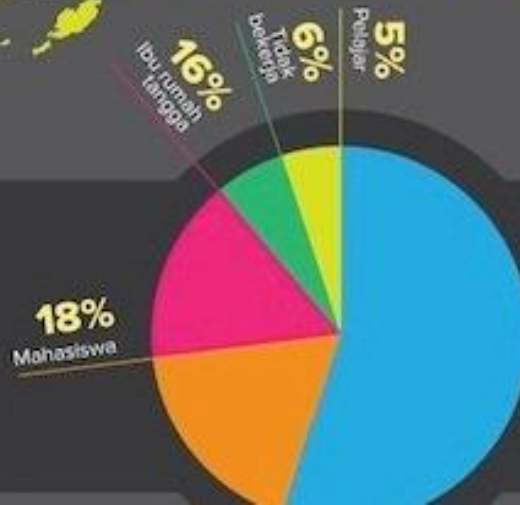


34,9%

dari total penduduk di Indonesia.



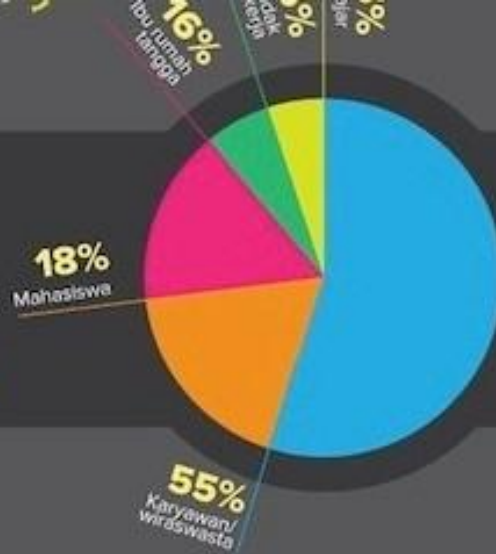
Usia Pengguna



Grafik Pengguna Internet di Tahun 2015
via CNNIndonesia.com

52juta

Usia Pengguna



Pengguna Internet Indonesia mengakses dengan:



Telepon Seluler



Laptop/notebook



PC Desktop



Tablet

Lima hal yang paling sering diakses pengguna internet Indonesia:

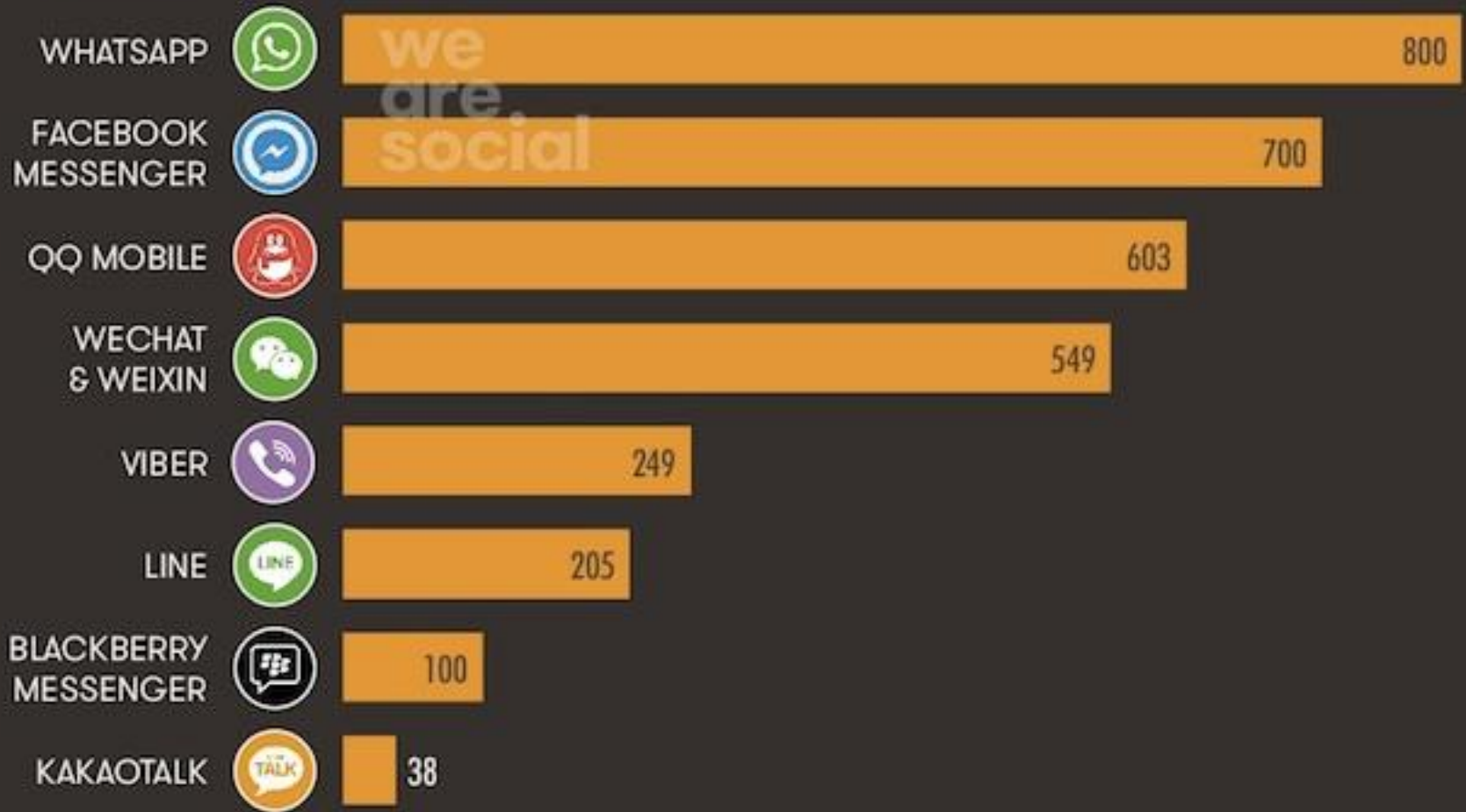


Grafik Pengguna Internet Berdasarkan Umur dan Perangkat Akses Pengguna Via CNNIndonesia.com

AUG
2015

CHAT APPS: ACTIVE USER NUMBERS

BASED ON ACCOUNTS THAT LOGGED IN AT LEAST ONCE IN THE MOST RECENT 30-DAY REPORTING PERIOD, IN MILLIONS



We Are Social • Sources: latest company statements, correct as at 01 August 2015

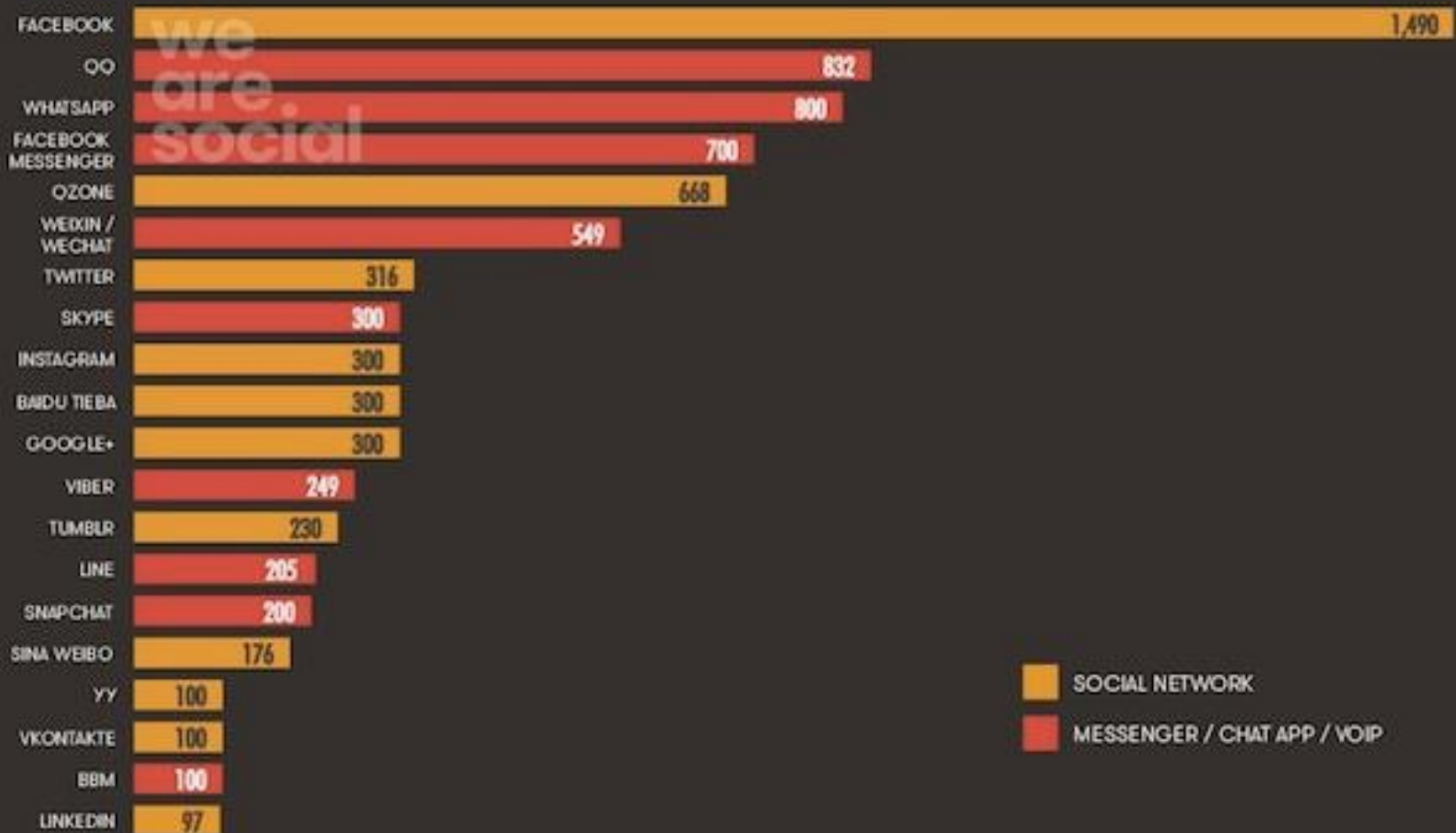
<http://wearesocial.sg> • @wearesocialsg

Grafik Pengguna Media Sosial Secara Global via id.techinasia.com

AUG
2015

ACTIVE USERS BY SOCIAL PLATFORM

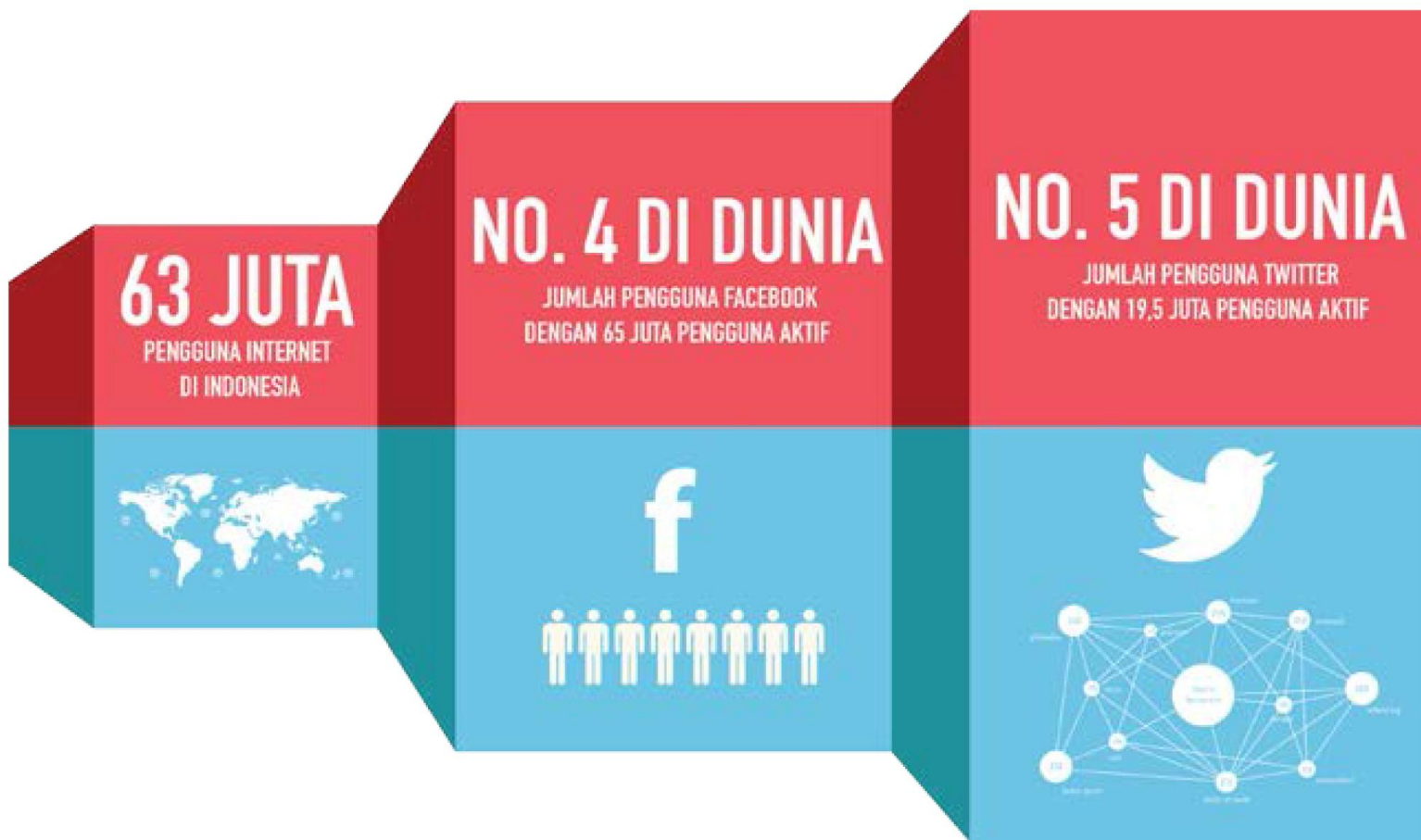
BASED ON ACCOUNTS THAT LOGGED IN AT LEAST ONCE IN THE MOST RECENT 30-DAY REPORTING PERIOD, IN MILLIONS



We Are Social • Sources: latest company statements, correct as at 01 August 2015

<http://wearesocial.sg> • @wearesocialsg

Grafik Pengguna Media Sosial secara Global via id.techinasia.com



Sumber : Kemenkominfo



SEJARAH IT

premechanical age (3000 BC-1450 AD)

tried to solve problems involving the representation, storage, and display information.

Writing, alphabets, paper and pen, the first books and libraries, early numbering systems, and tool like the abacus calculator.

mechanical age (1450-1840)

people began to use technology to build machines like the printing press and mechanical calculators to help improve access to information and increase the accuracy of available information.





electromechanical age (1840-1940)

increased the need for more advanced technology to support more sophisticated information systems.

Technologies that resulted from the harnessing of electricity helped meet this need.

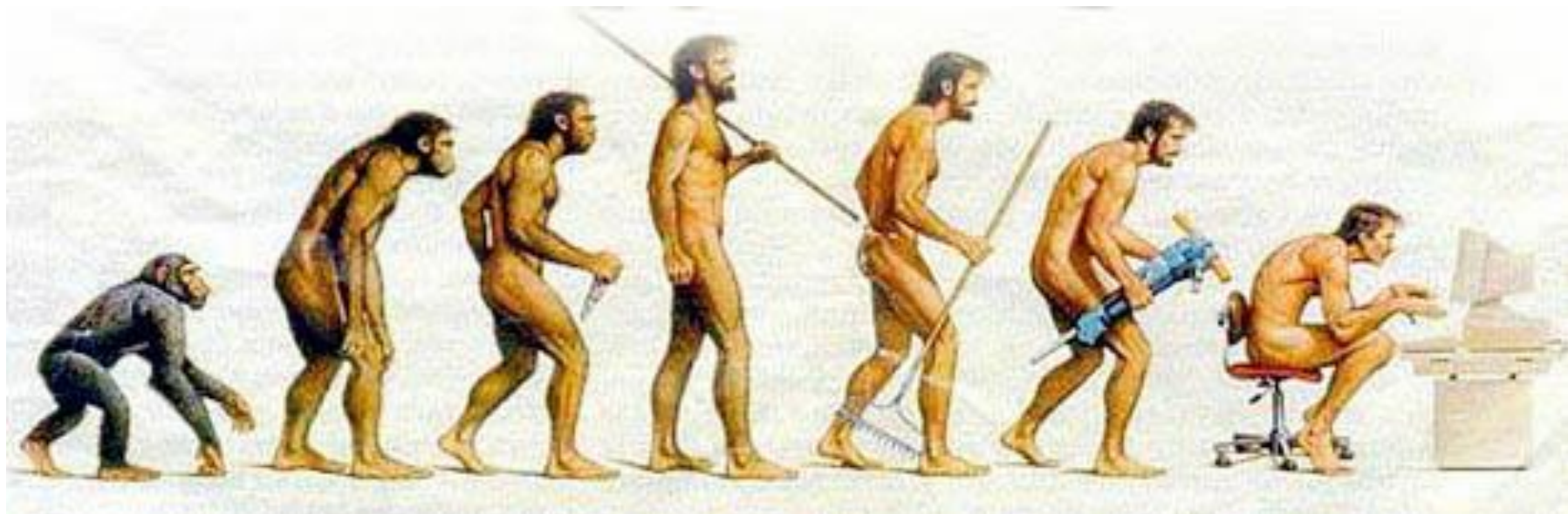
electronic digital technology age (1940-now)

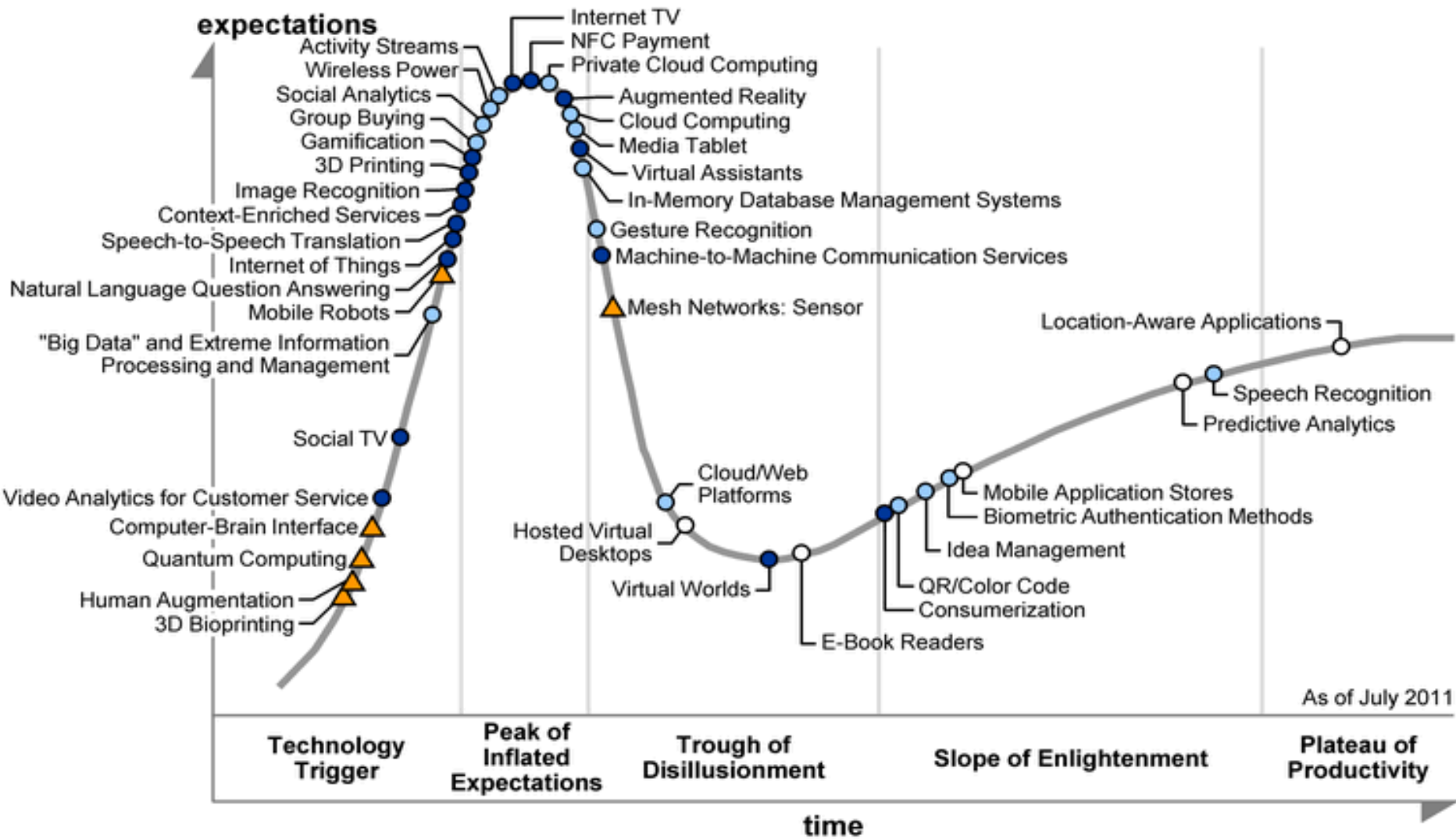
to create ever faster, more powerful, and more reliable technologies to help deal with the demands of our fast-paced world.

“Information Technology (IT) the handling of information by electric and electronic (and microelectronic) means.”

Here handling includes transfer, processing, storage and access, IT special concern being the use of hardware and software for these tasks for the benefit of individual people and society as a whole”

Eric Deeson, Harper Collins Publishers, Dictionary of Information Technology, Glasgow,UK,1991





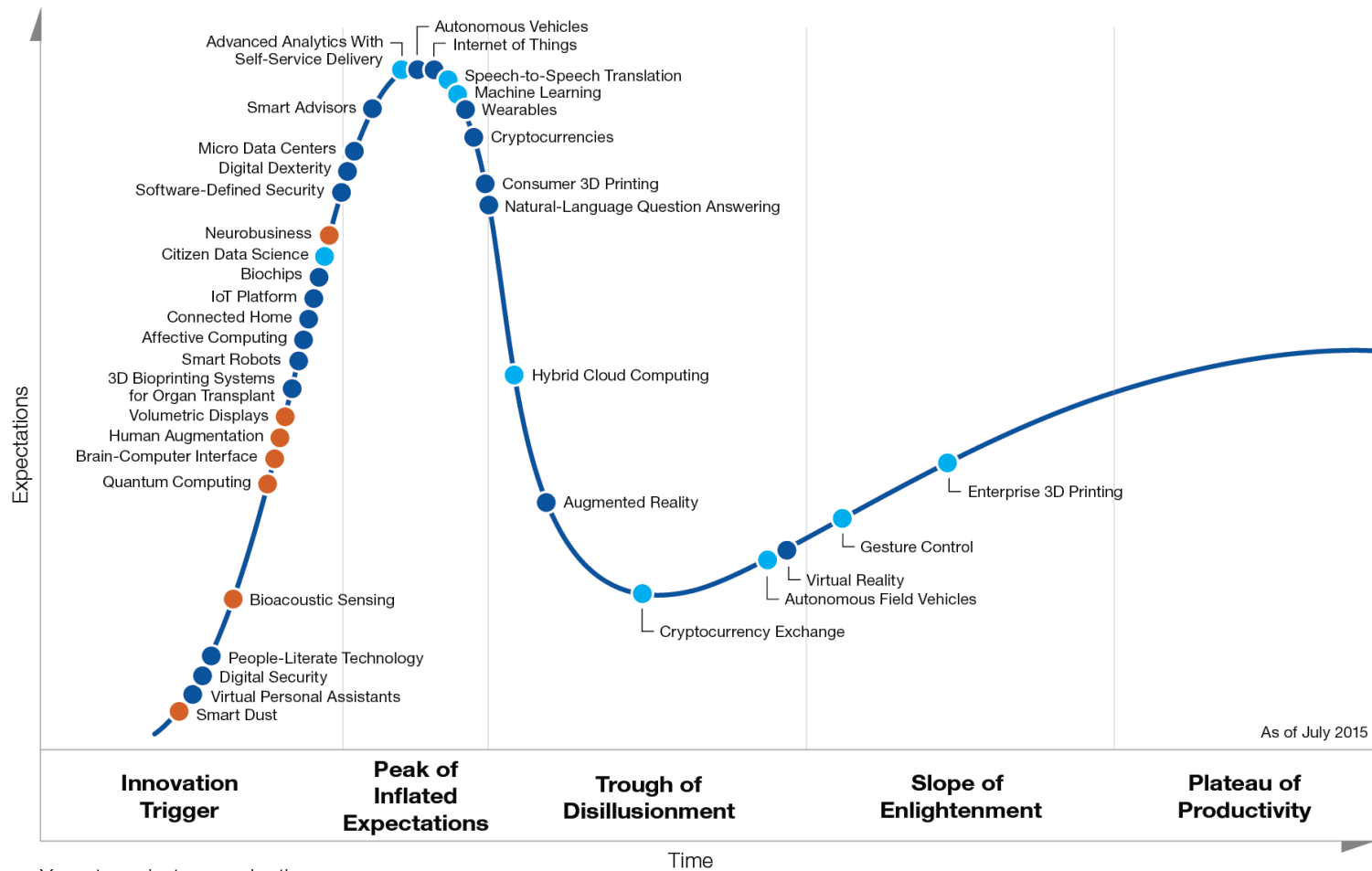
As of July 2011

Years to mainstream adoption:

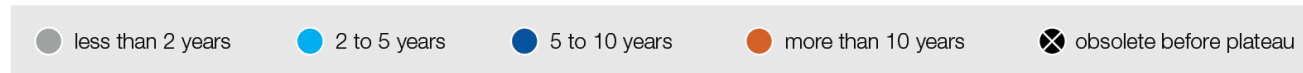
- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

Hype Cycle for Emerging Technologies (Gartner, 2011)

Emerging Technology Hype Cycle



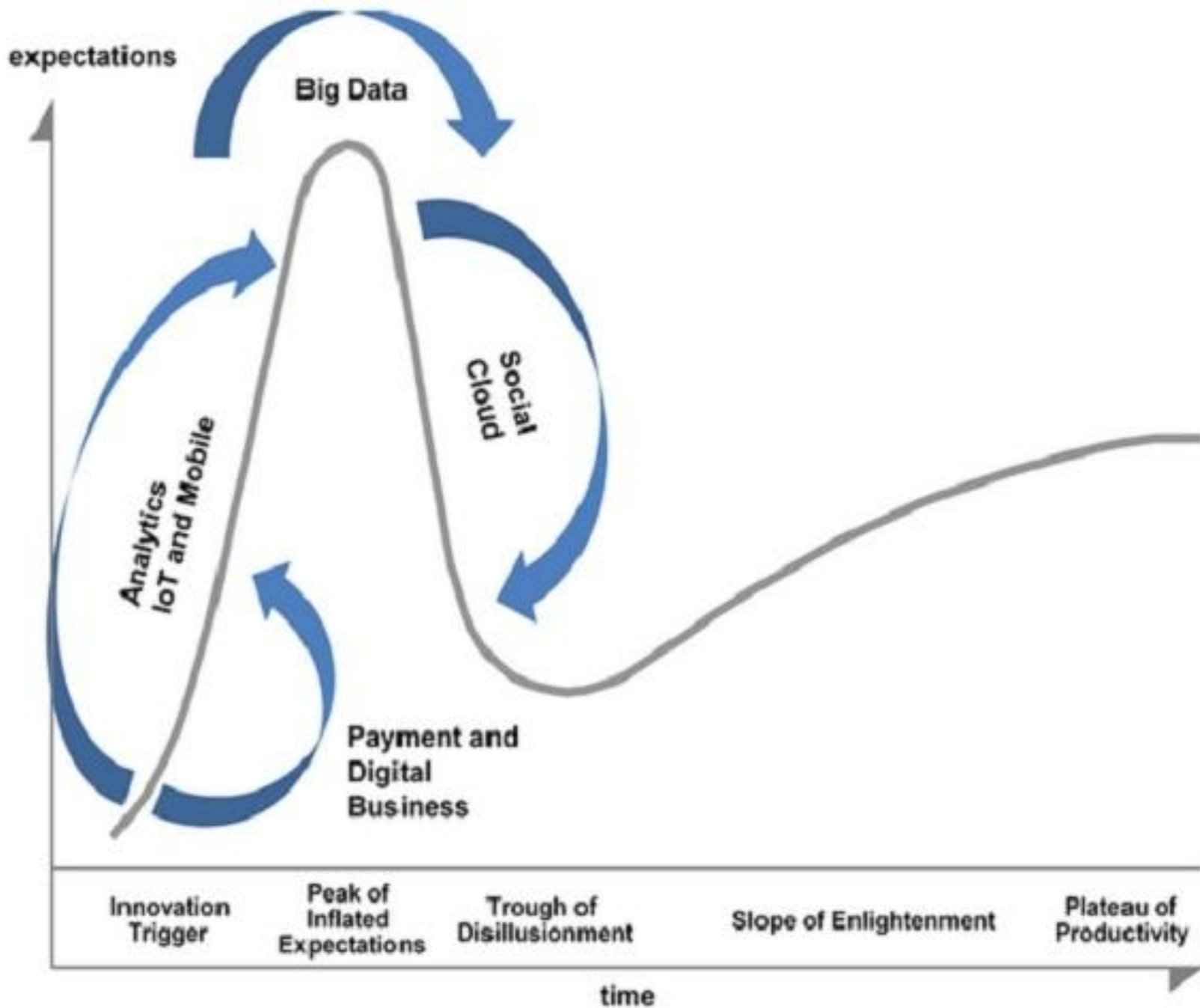
Years to mainstream adoption:



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<http://www.gartner.com/technology/about.jsp>

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Stock Symbol: IT (NYSE)
2012 Revenue: \$1.616 Billion
USD


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15-16 October 2013

[Gartner Symposium/ITxpo 2013 Tokyo, Japan](#)
15-17 October 2013

4 megatrend di dunia teknologi TIK sekarang



- **Mobile**

adopsi perangkat mobile yang luar biasa pesat menyebabkan cara orang bekerja, belajar, dan bermain berubah. Trend ini terlihat di mana-mana (apalagi di Indonesia) kita melihat orang berjalan kaki tapi matanya tertuju ke perangkat genggamnya, atau sekumpulan orang duduk di meja yang sama (misalnya di restoran), tapi semuanya sibuk dengan perangkat genggamnya.

- **Social**

Aplikasi-aplikasi sosial juga menjadi sangat populer, misalnya Facebook atau Twitter, yang sangat populer di semua kalangan, mulai dari anak-anak sampai orang dewasa. Aplikasi-aplikasi sosial ini sangat memudahkan orang untuk saling terhubung.

- **Big Data**

Kedua hal di atas (mobile dan sosial) mengakibatkan ledakan data yang luar biasa. Dengan pertumbuhan yang eksponensial, kita membutuhkan suatu teknologi analisa data yang baru untuk menganalisa data yang ukurannya sangat luar biasa besar itu, misalnya untuk menemukan peluang bisnis baru, mencegah penyebaran wabah penyakit, atau memerangi kejahatan.

- **Cloud**

Trend Awan ini semakin memperkuat ketiga megatrend tadi di atas. Teknologi awan memberikan kemampuan komputasi dan konektivitas yang merata di manapun. Bagi para pengambil keputusan, teknologi awan membuat TIK menjadi landasan yang strategis untuk bisnis.

Current Trends in TMT

- Smartphones
 - Mobile internet will make it compelling for everyone to own a smartphone
 - Cell phone base may reach 4 billion units in 2010 – growing 1.2 billion units/year
 - Smartphones just 5% of this market today – units growing 25% in tough economy
 - Key winners: Research in Motion, Apple - they have the software expertise
 - Losers: Nokia?
- Cloud Computing and Virtualization
 - Desktops are dead – new world is one desktop, anywhere, anytime, any device
 - Huge cost savings for enterprises
 - Enabled by advances in software and networking
 - Key winners: Citrix Systems, VMWare
 - Losers: Intel? Microsoft? Hard disk drive and DRAM manufacturers?

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How to respond to anti-innovation phrases

EVENTS
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WEBINAR
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SPECIAL REPORT
Top 10 Technology Trends 2015

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Trending Topics



Trends & PREDICTIONS
Top 10 Predictions for 2015: Digital Business Is Driving 'Big Change'



BIG DATA
Answering Big Data's 10 Biggest Vision and Strategy Questions



Mobile COMPUTING
A Supermarket Mobile App Case Study



Information SECURITY
Five Golden Rules for Creating Effective Security Policy



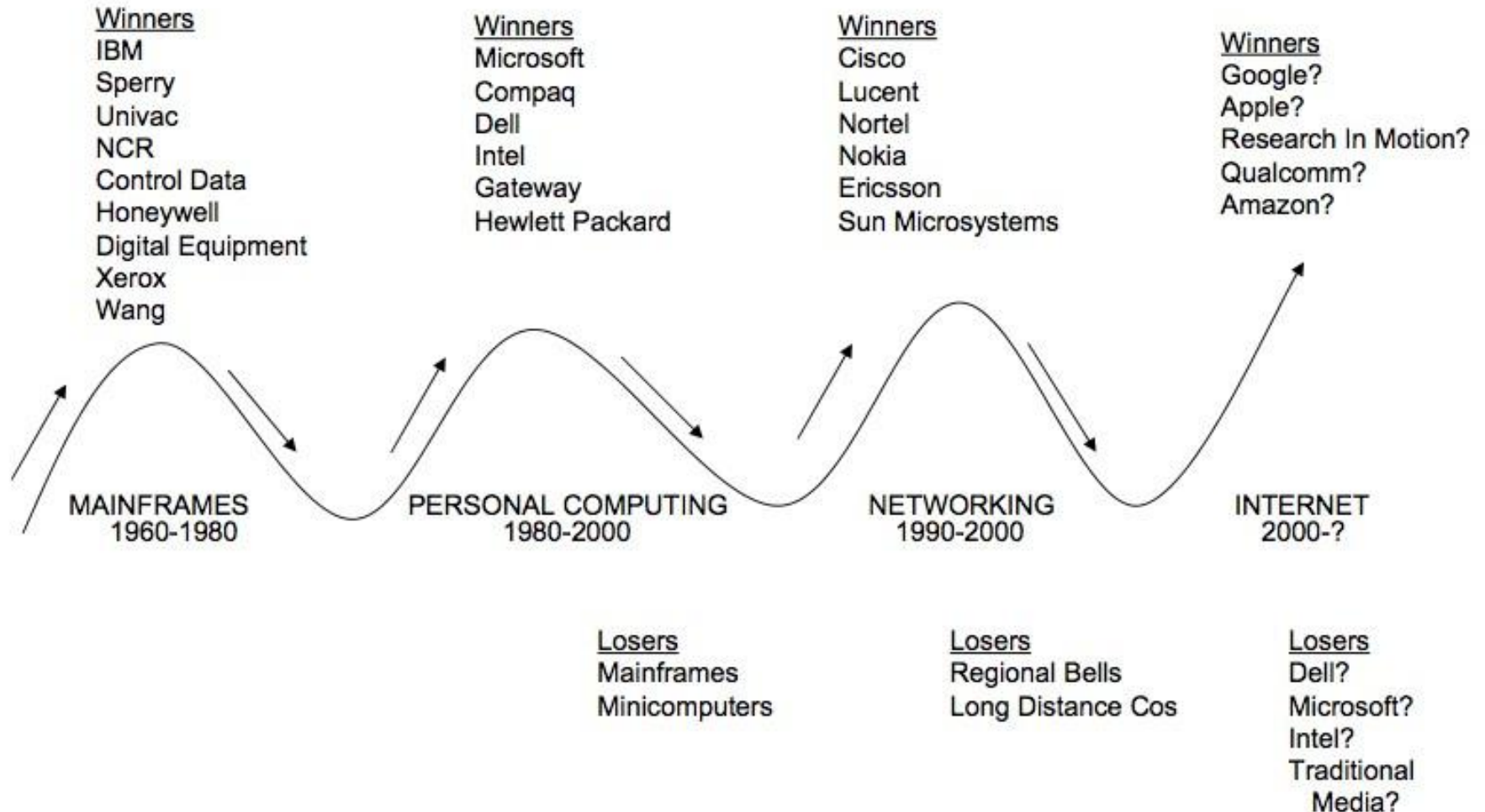
CLOUD
Top 10 Cloud Myths

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Technology Trends Create and Destroy Value



* The above stock selections are not intended to represent investments made by Coatue
 Source: Coatue analysis

3D Bio-printing

Tissue engineering brings disruptive innovation to medicine



"An emerging and interdisciplinary field that applies the principles of **engineering and the life sciences** toward the development of **biological substitutes** that restore, maintain, or improve tissue function."

Printing technology has hit an inflection point



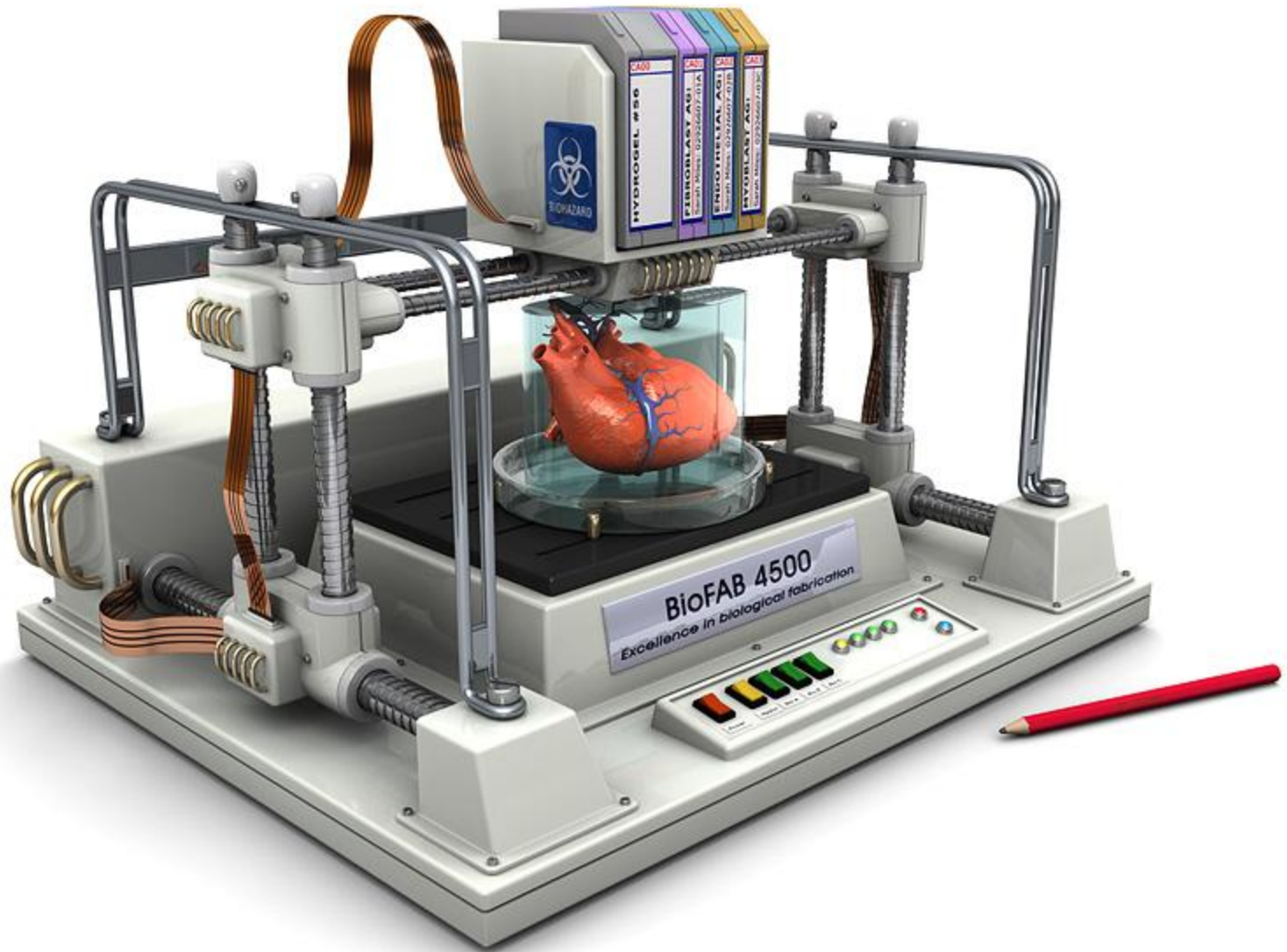
>10m



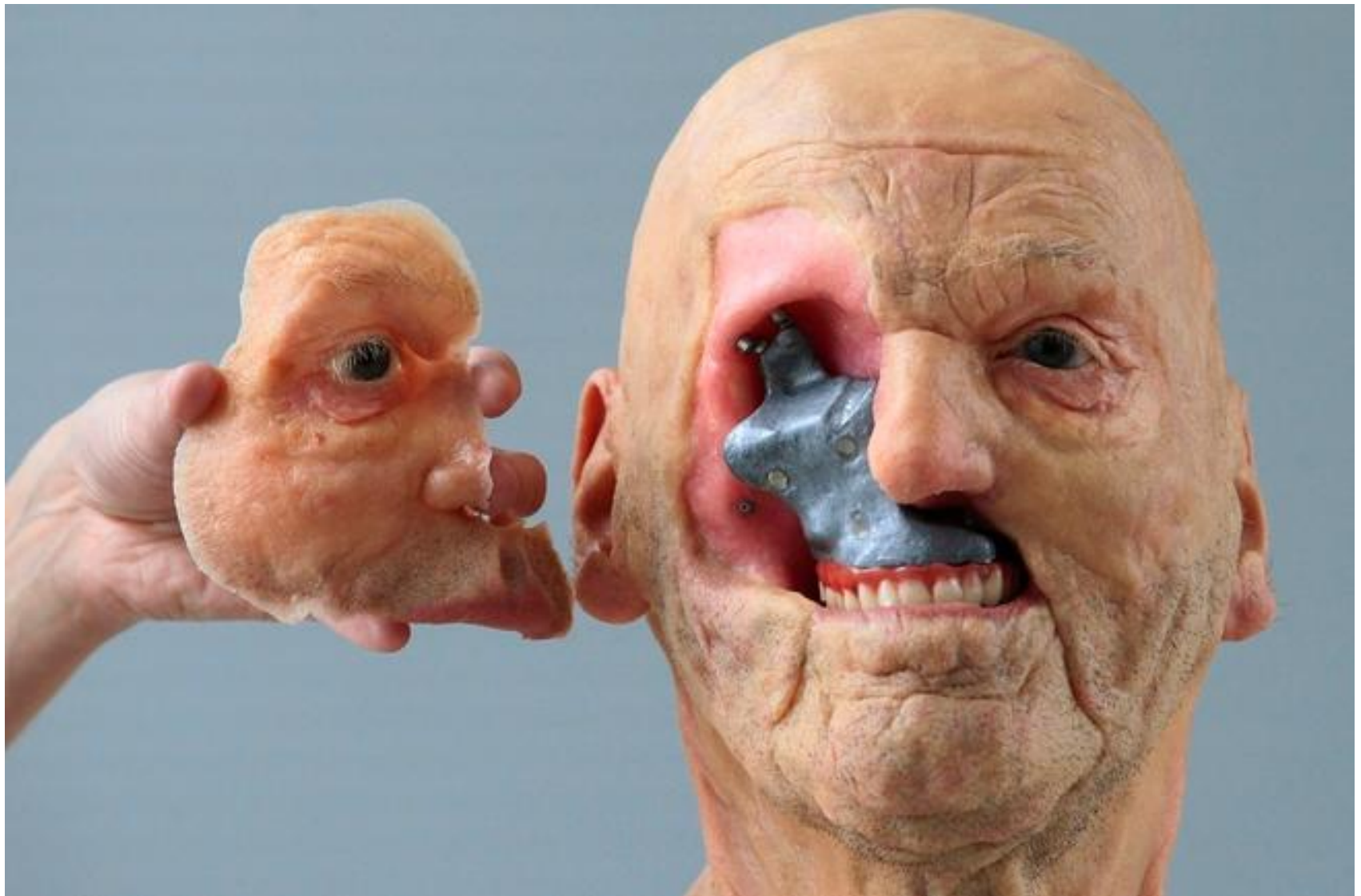
μm

2 dimensional

3 dimensional



Sometime next decade replacement human organs may be bioprinted to patient specification using technology derived from today's inkjet printers.



“Materialise, a Belgian-based 3-D printing company, presented a 3-D model of a complex facial prostheses in Leuven in January.”

Human Augmentation

Muskegon Community College
2010-2011 Lecture Series

**"The Future of Human
Augmentation"**

by Dr. Joseph Dvorak

Innovation Manager and Technology Futurist for
Research in Motion (The Blackberry People)

Recorded on Thursday October, 28th 2010

What do we mean by ‘Augmentation’?

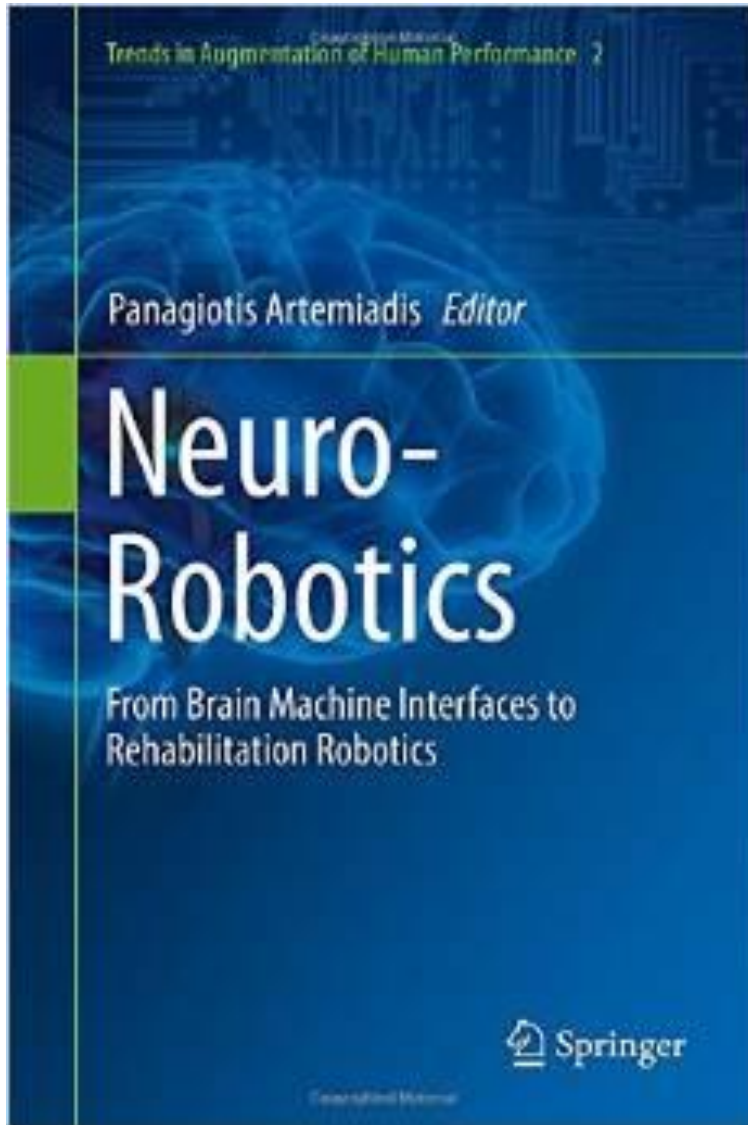
- ✓ Compensating for missing/injured capabilities
- ✓ Markedly improved traits and abilities
- ✓ Longer **AND** better life
- ✓ Improvement of the Human gene pool



Advances in Human Augmentation: We Can Rebuild Him

The "bionics" made popular by the futuristic 1970s television shows "**The Bionic Woman**" and "**The Six Million Dollar Man**" may finally be coming into their own.





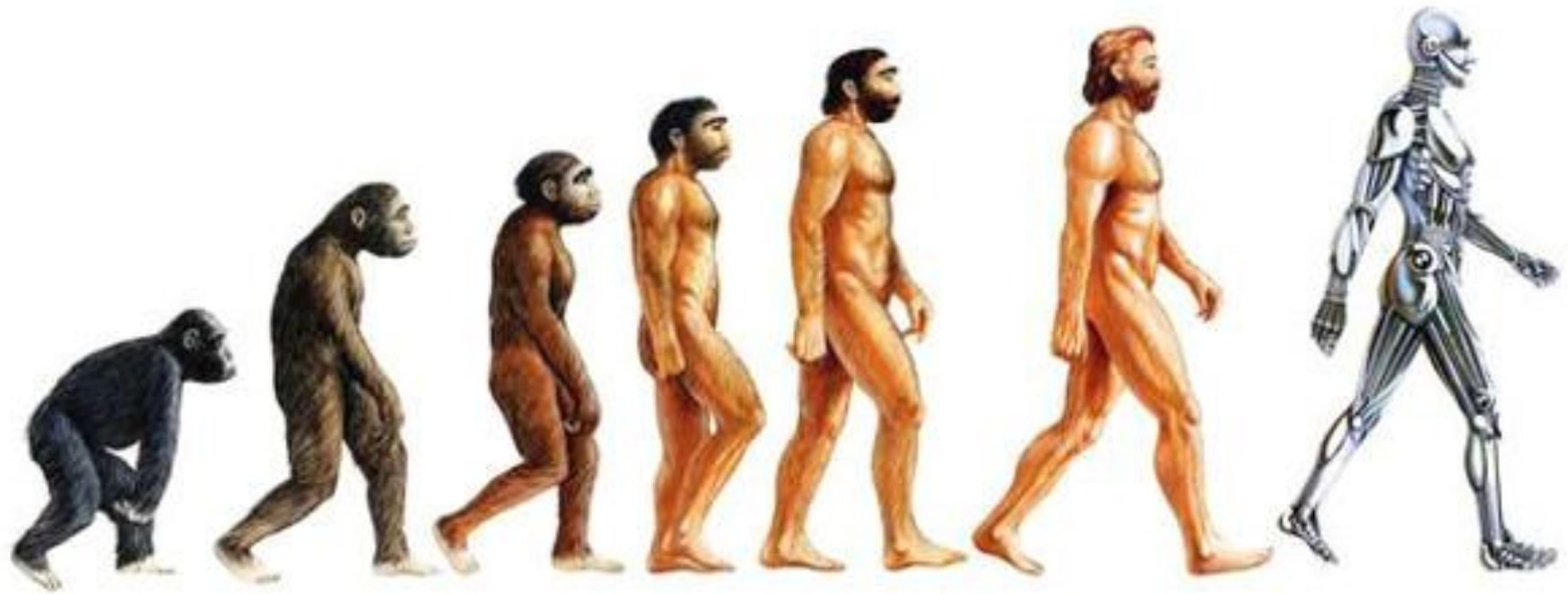
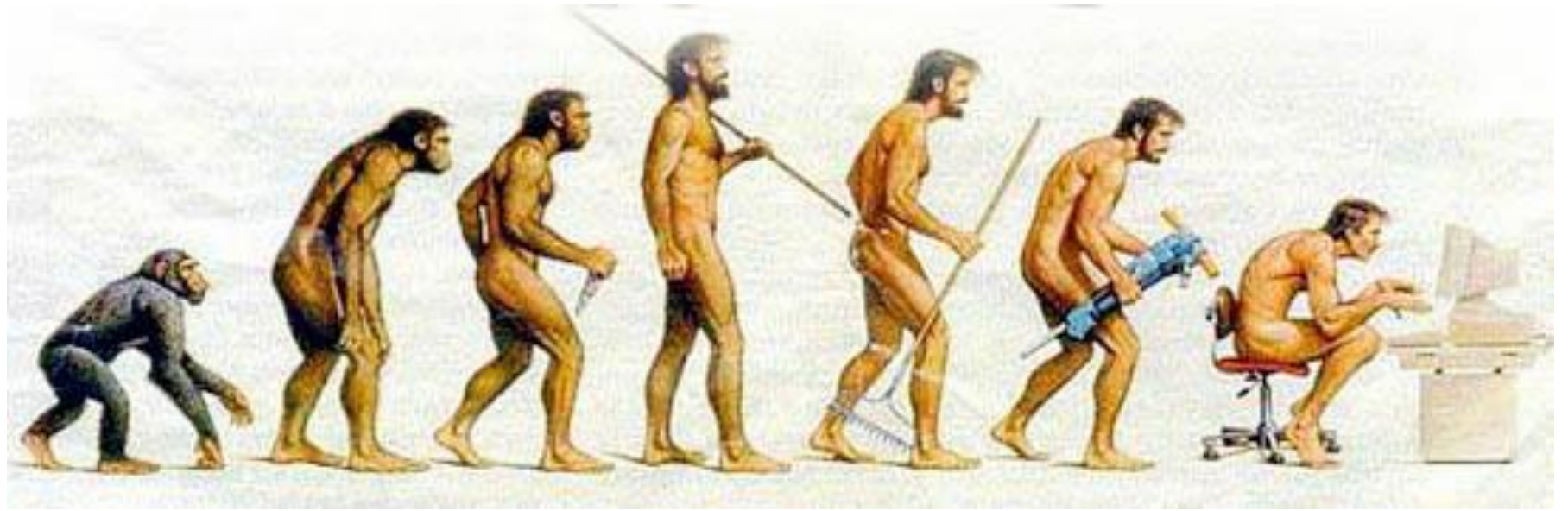
Neuro-Robotics: From Brain Machine Interfaces to Rehabilitation Robotics (Trends in Augmentation of Human Performance) Hardcover

– July 11, 2014

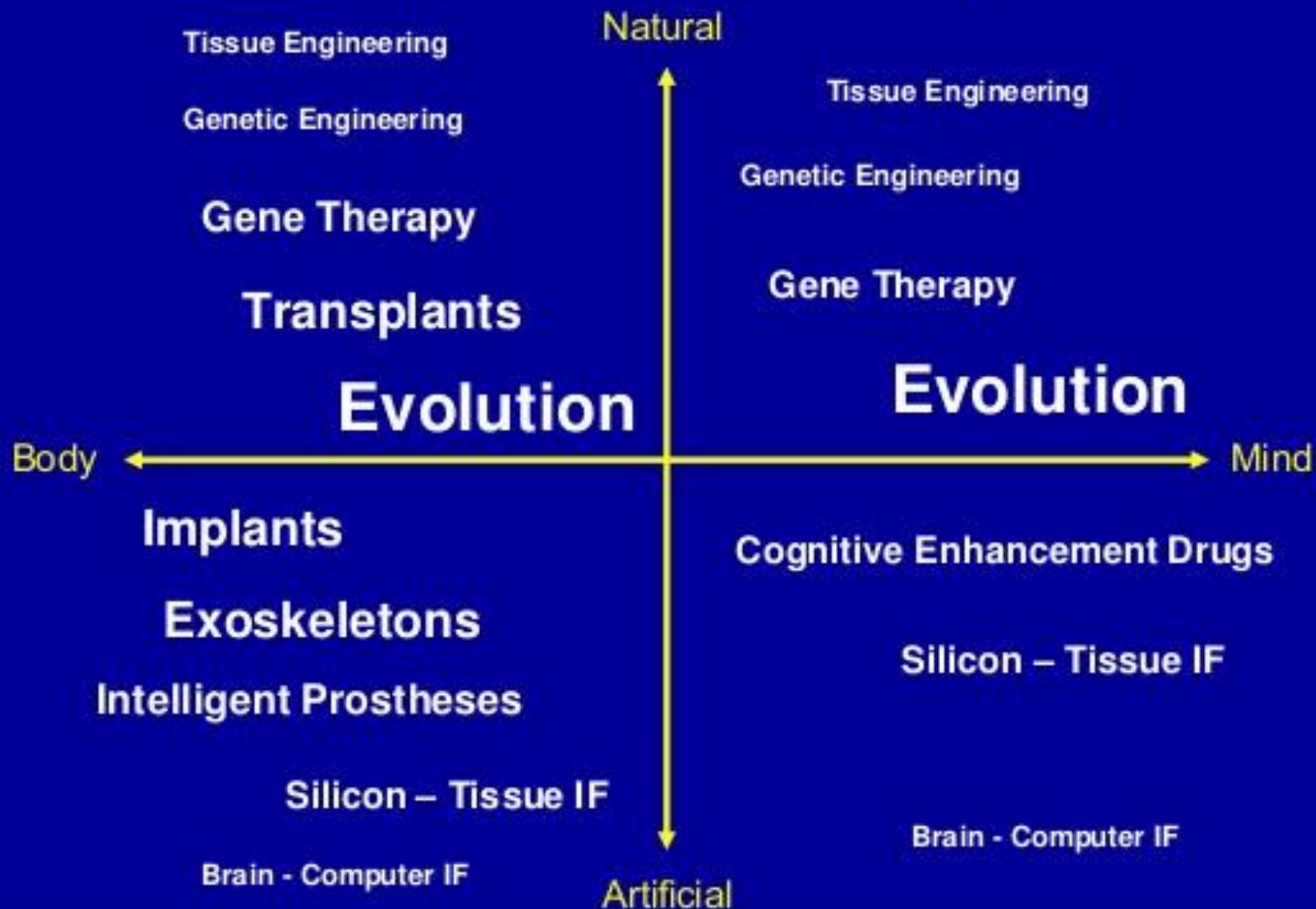
by Artemiadis (Editor)

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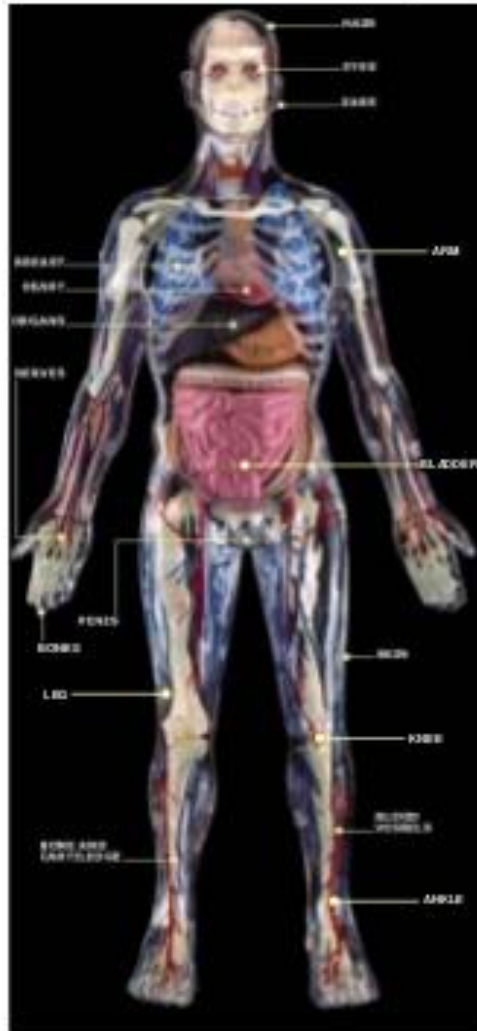


The Dimensions of Human Augmentation



Now Many Parts of our Bodies Have Artificial Replacements

Medicine and technology will now be concerned with **Enhancing**



... And More Are Coming



Cognitive Enhancement Drugs



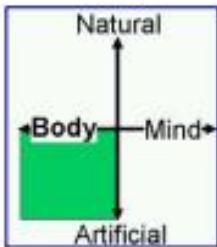
Artificial Spleen



Artificial Blood



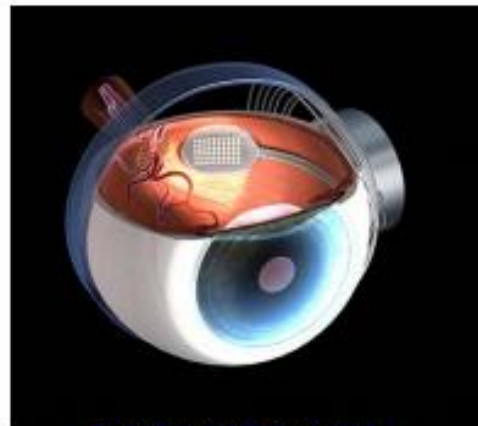
Artificial Pancreas



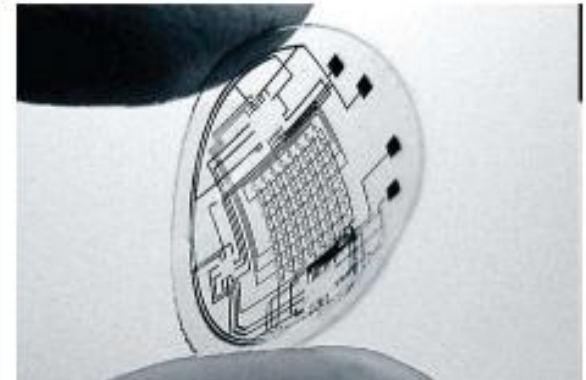
The Hu ↔ Si Interface

Nanoscale Engineering + Biotechnology + Neurotechnology

- Artificial eyes using arrays of CCD sensors to bypass damaged optic nerve
- Contact lens with embedded LED display
- Prostheses controlled by brain activity
- Prostheses that provide world class speed, strength



[Next-Generation Retinal Implant](#)



[Contact Lens Display System](#)



[Thought powered arm](#)



[Cheetah prosthesis](#)

“It will create/expand the ‘Biological Divide’”

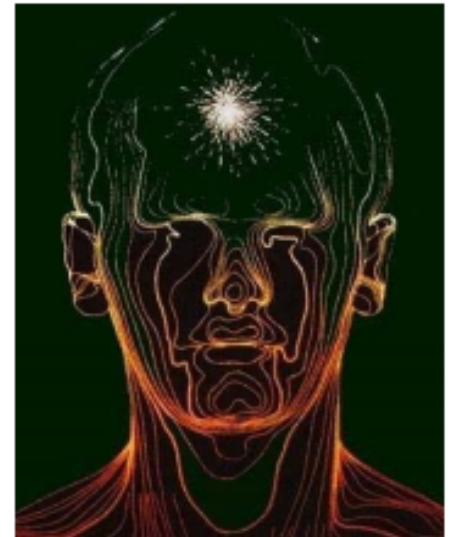
‘Ordinaries’



‘Normal’,
Empathetic

- A vocabulary has arisen describing the ‘Biological Divide’
 - Augments: those utilizing the technologies of Human Augmentation
 - Ordinaries: those who do not
- The big question: Can the Ordinaries compete with the Augments?

‘Augments’



Faster,
Stronger,
Smarter,
Healthier

Quantum Computing

Conventional Computer

On = 1
Off = 2 } Binary Digit = Bits

Quantum Computer

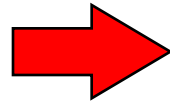
Quantum Computer store and Process data in 'Qubits'

Ribuan kali lebih cepat dan efisien dari IBM "Roadrunner" di Los Alamos yang kecepatannya mencapai 1.7 petaflops (1 petaflop = 10^{15} operasi per detik).

Bit VS Qubit

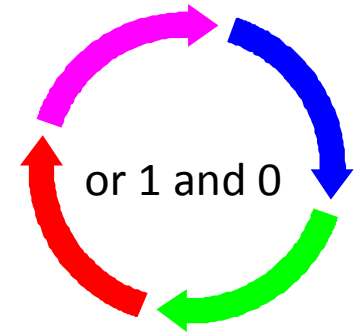
Classical Bit

- 0 or 1

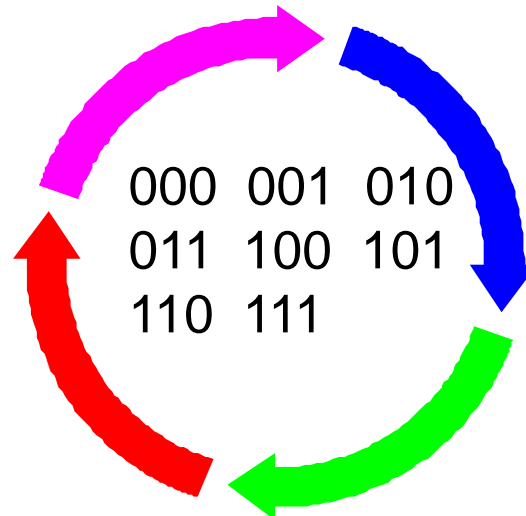
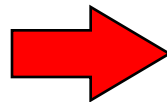


Qubit

0 or 1



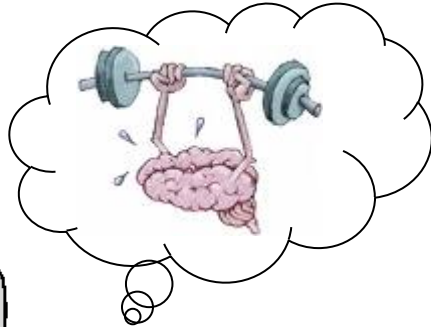
- 101



Quantum Computer atau komputer kuantum memanfaatkan fenomena 'aneh' yang disebut sebagai superposisi. Dalam mekanika kuantum, suatu partikel bisa berada dalam dua keadaan sekaligus. Inilah yang disebut keadaan superposisi. Dalam komputer kuantum, selain 0 dan 1, dikenal pula superposisi dari keduanya. Ini berarti keadaannya bisa berupa 0 dan 1, bukan hanya 0 atau 1 seperti di komputer digital biasa. Komputer kuantum tidak menggunakan Bits tetapi QUBITS (Quantum Bits).

Karena kemampuannya untuk berada di bermacam keadaan (multiple states), komputer kuantum memiliki potensi untuk melaksanakan berbagai perhitungan secara simultan sehingga jauh lebih cepat dari komputer digital. Kini Sebuah perkembangan teknologi baru telah lahir yaitu Komputer Quantum, debutnya pada tanggal 13 February, 20 tahun lebih cepat dari jadwal sebelumnya. Kemampuan komputasi nya yang luar biasa (dapat melakukan 64000 operasi secara simultan).

Classical



$$172475846743 = ?x?$$

Quantum



$$172475846743 =$$

$$870901 \times 198043$$

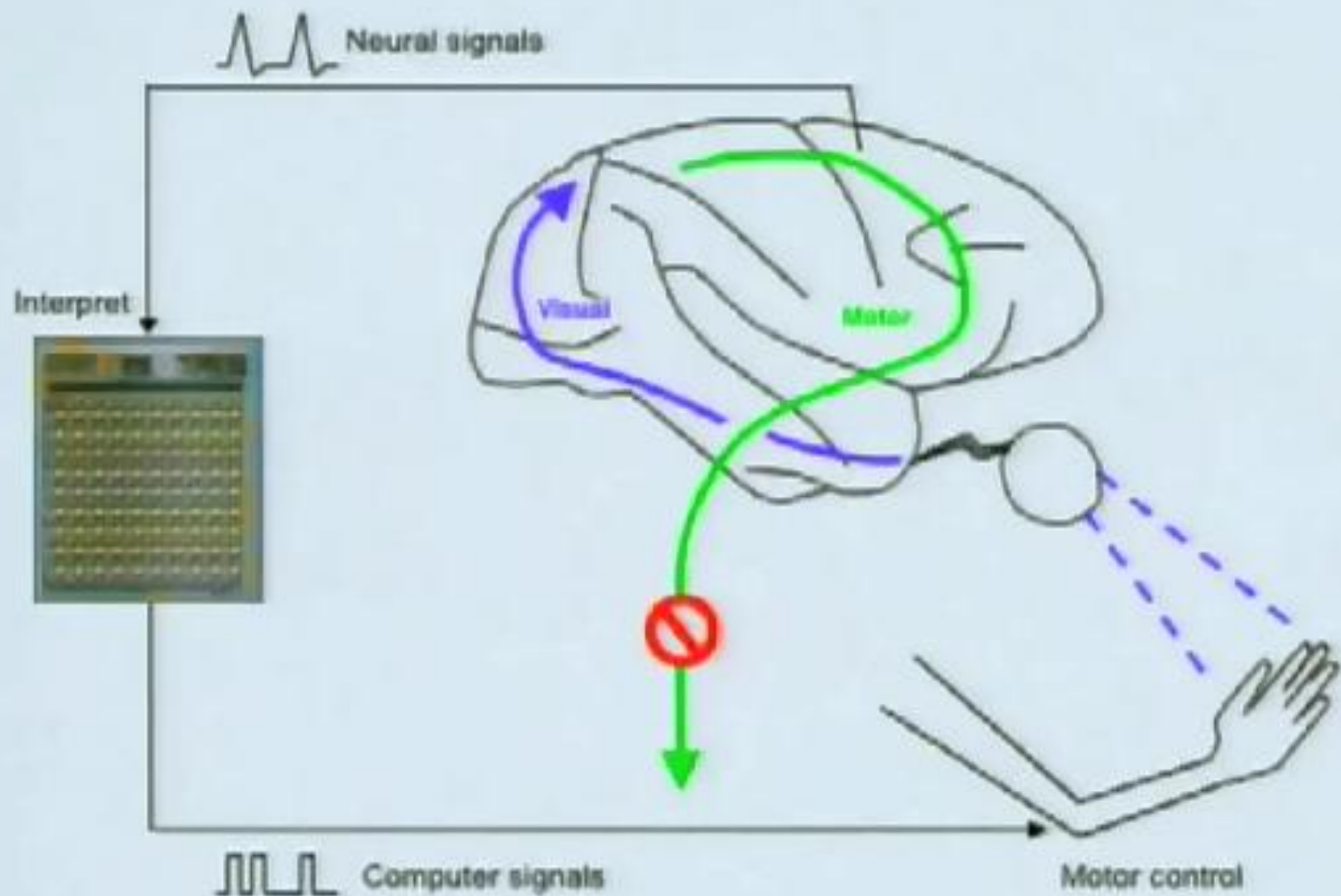
Brain-computer Interfaces

Problem: Millions are unable to move or communicate

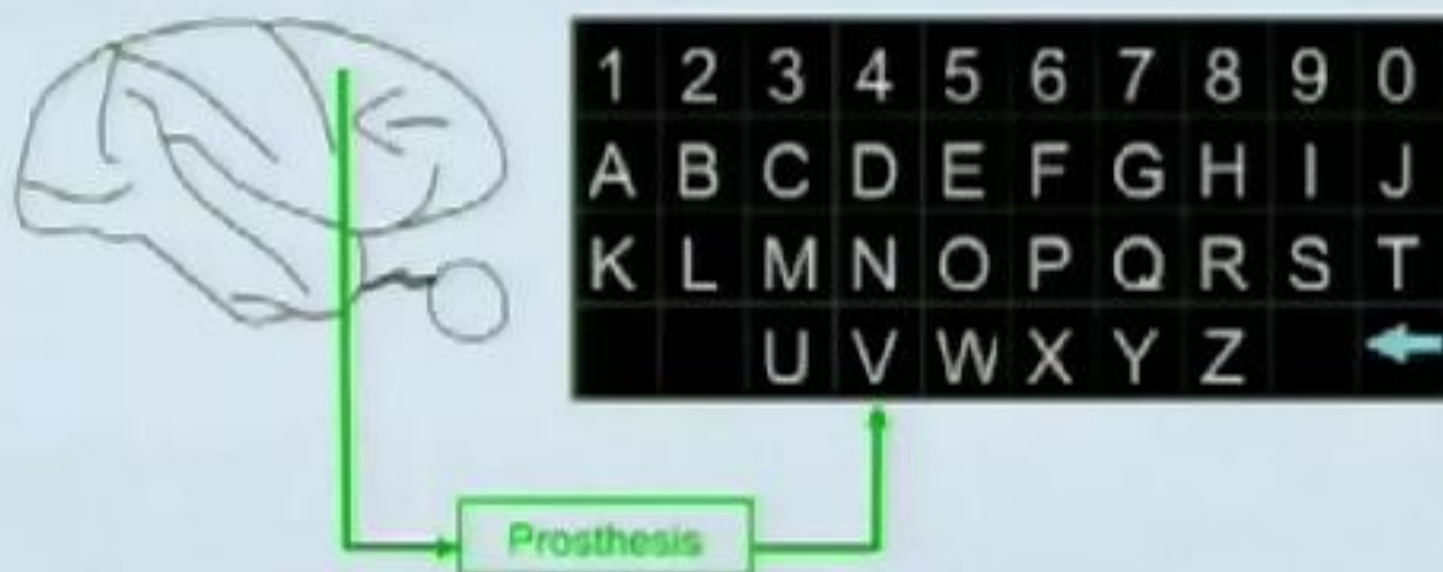
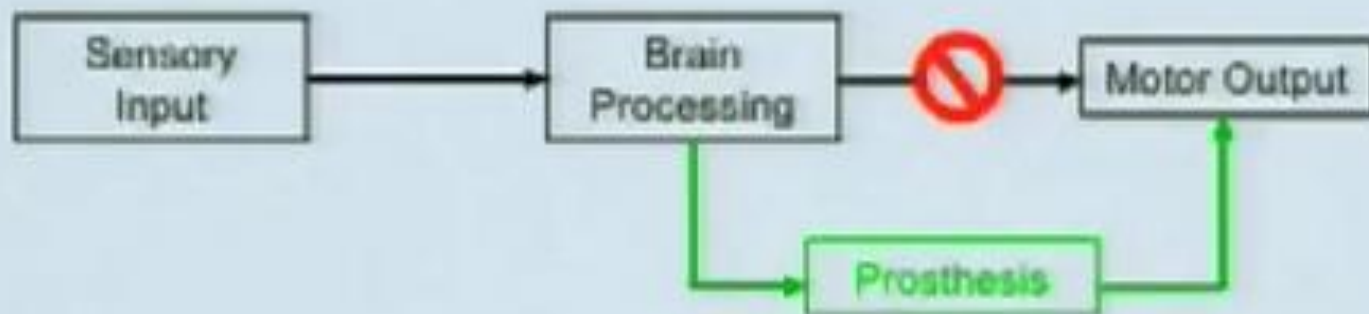


Christopher Reeves (Superman)

Potential solution: Interpret neural signals to guide prostheses



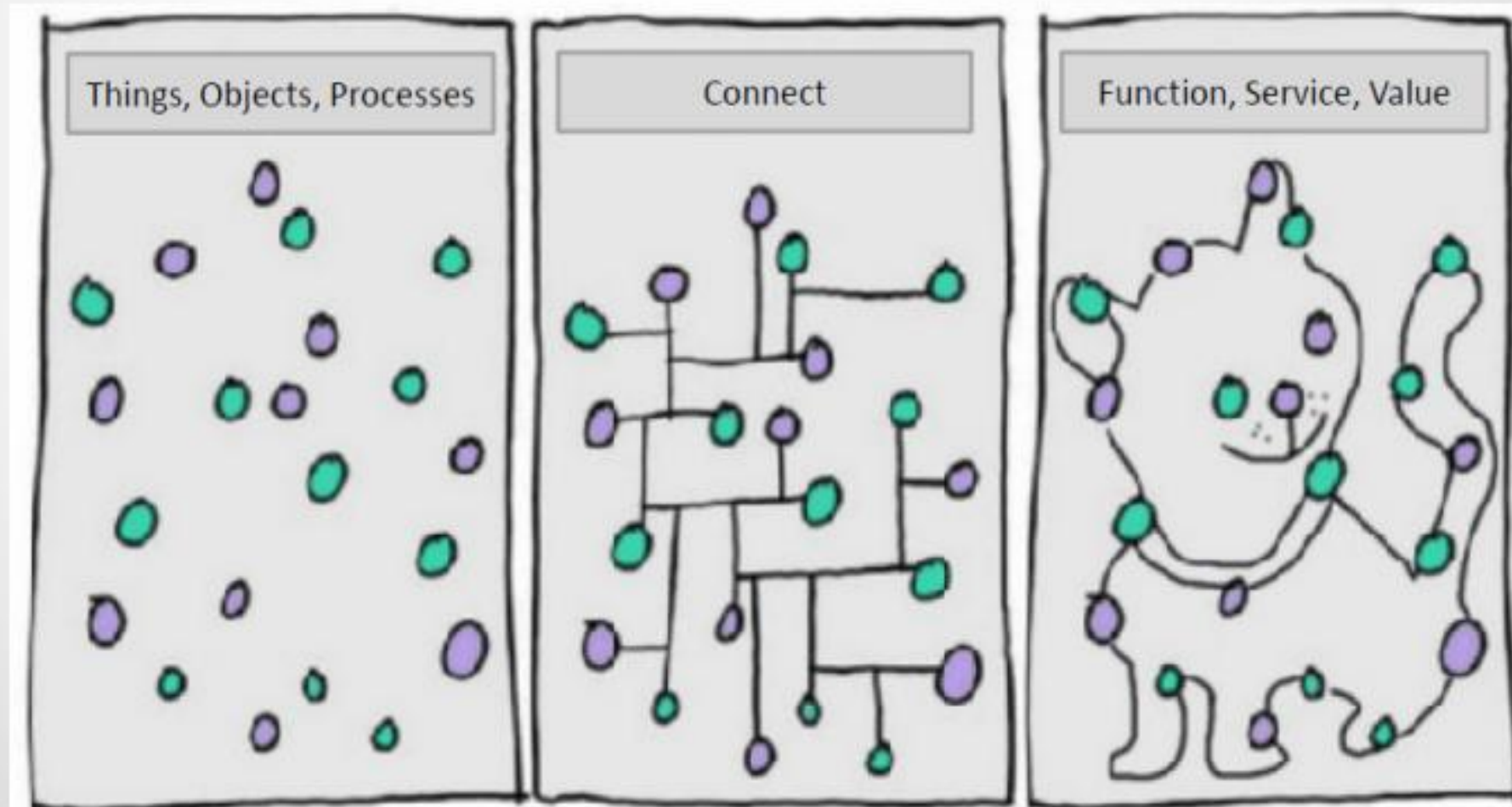
Neural Prostheses for Moving and Communicating



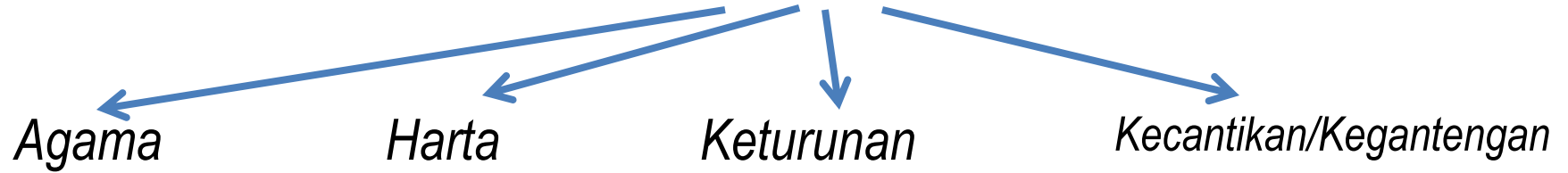
Mobile Robot



Value Creation by Industrial Internet



Menentukan Calon Istri/Suami



Expert Choice comparison SUITE Workgroup: taufik_hp@yahoo.com Project: Istri For Non-Commercial Use Only

taufik hery Resource Center Logout

Structure Measure Synthesize Allocate Iterate Reports

You have completed providing your judgments. These percentages are the relative priorities of the alternatives.

- Memilih Istri (100.00%)
 - Harta (0.79%)
 - Keturunan (2.80%)
 - Kecantikan (22.22%)
 - Agama (68.19%)

Show results as: Priority

No. ▲	Name	Participant results	Bar Graph
1	Sri	28.79%	
2	Rini	26.99%	
3	Ayu	44.22%	

These are the overall priorities of your alternatives. Please review them to see if they make sense to you. If not, you may have made a clerical error. You can navigate back (using the Navigation Box) to review and edit your judgments.

Navigation Box Steps: 1 ... 16 17 18 19 20 21 22 23 24 25 26 Evaluated: 18/18

Next Unassessed Previous Next

English Project status: Available but offline Version: 5.11.1

Sample_IT Portfolio....ahps Show all downloads...

Windows taskbar: 8:43 AM 4/9/2014

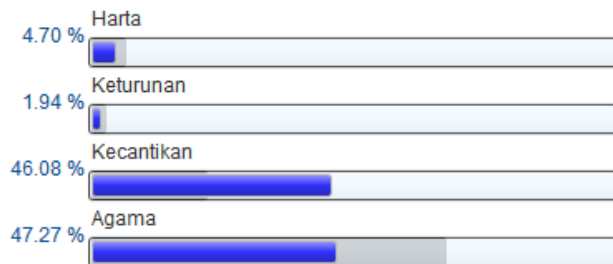
<http://trial.expertchoice.com/Comparison.aspx#Project/Evaluate/Default.aspx?resetproject=yes>

Select participant or participants group: [All Participants] ▼

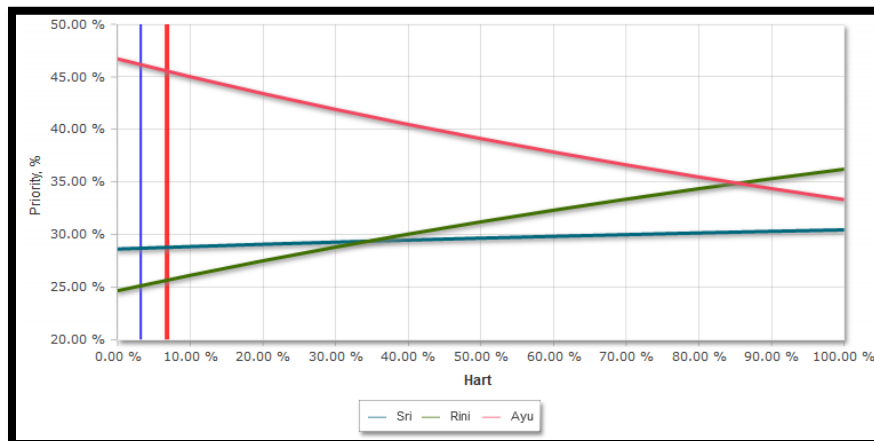
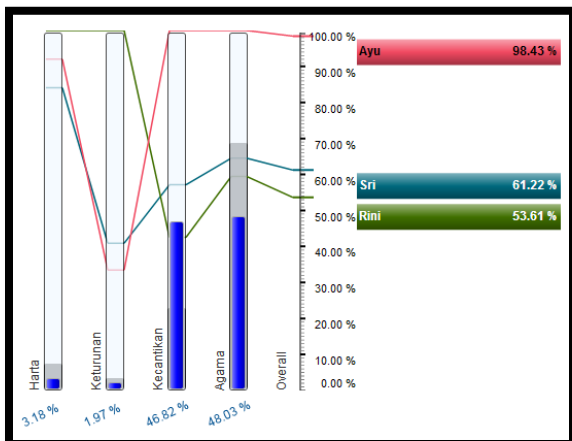
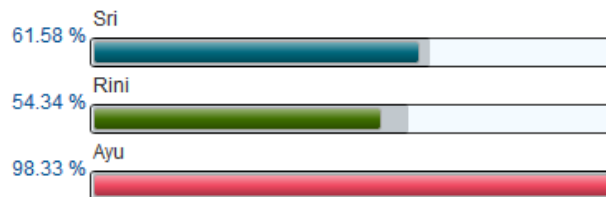
Download

		0			1	2	3	4
					Pairwise	Pairwise	Pairwise	Pairwise
		Cost	Risk	Total	Harta	Keturunan	Kecantikan	Agama
1	Sri	0.0000	0.0000	0.6354	0.8407	0.4091	0.5713	0.6452
2	Rini	0.0000	0.0000	0.5958	1.0000	1.0000	0.4251	0.5946
3	Ayu	0.0000	0.0000	0.9759	0.9201	0.3347	1.0000	1.0000

Objectives



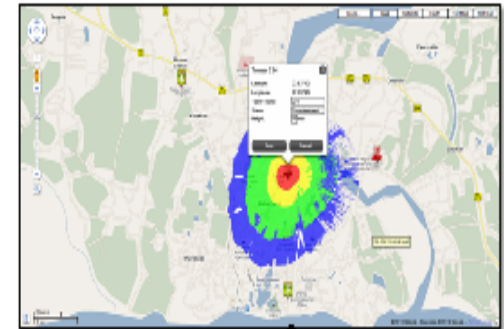
Alternatives



By 2015 global Internet traffic will be 4,8 zettabytes a year

By 2015 global Internet traffic will be 4,8 billion terabytes!

Timeline of GIS Platforms



1854 Paper Based
GIS

1962 Mainframe
Based GIS CGIS

1980s Desktop
Based GIS

1990s-2000s Web
Based GIS

2010- Cloud Based
Gis

Jaman Internet = Jaman batu

Klo di bilang bahwa kehidupan selalu berputar, maka kehidupan kita saat ini juga merupakan putaran dari kehidupan sebelumnya. Apa yang kita anggap sebagai sebuah kemajuan, secara dasar adalah proses kembali pada tataran kehidupan sebelumnya.... pusing ya? Mari kita sederhanakan....

Dulu, ada masa yang kita kenal sebagai jaman batu(prasejarah), kemudian jaman modern (jaman bersejarah) dan terakhir jamaninternet (cyber). Artinya setelah jaman modern, kehidupan kita saat ini dan ke depan, tak ubahnya mengikuti berbagai pola kehidupan di dunia batu.

1. Gambar sebagai alat bahasa

Saat ini kita banyak menggunakan icon, gambar dan simbol dalam mengkomunikasi sesuatu. Yang paling gampang dan sering digunakan adalah icon-icon yang berada di program komputer. Mengunaan icon ini merujuk kembali penggunaan piktogram, yakni penulisan huruf paku yang (lebih mirip gambar) oleh manusia purba di dinding gua. >> Penggunaan piktograf pada dasarnya merupakan bentuk komunikasi secara sederhana, sedang penggunaan icon adalah upaya menyerdahkan komunikasi.

2. Hak Kepemilikan

Klo mo cari informasi sesuatu, gooling aja. dunia cyber memiliki apapun secara tidak terbatas. Semuanya gratis. bahkan kita bisa mendapatkan program, lagu, video dan apapun secara gratis. Banyak orang yang men"share" berbagai file yang dimiliki tanpa berpikir untung rugi. Internet telah menyediakan apapun, sama seperti alam menyediakan semuanya pada jaman batu. pada jaman batu, yang namanya binatang itu gratis, tinggal bagaimana seseorang mampu berburu di alam liar.

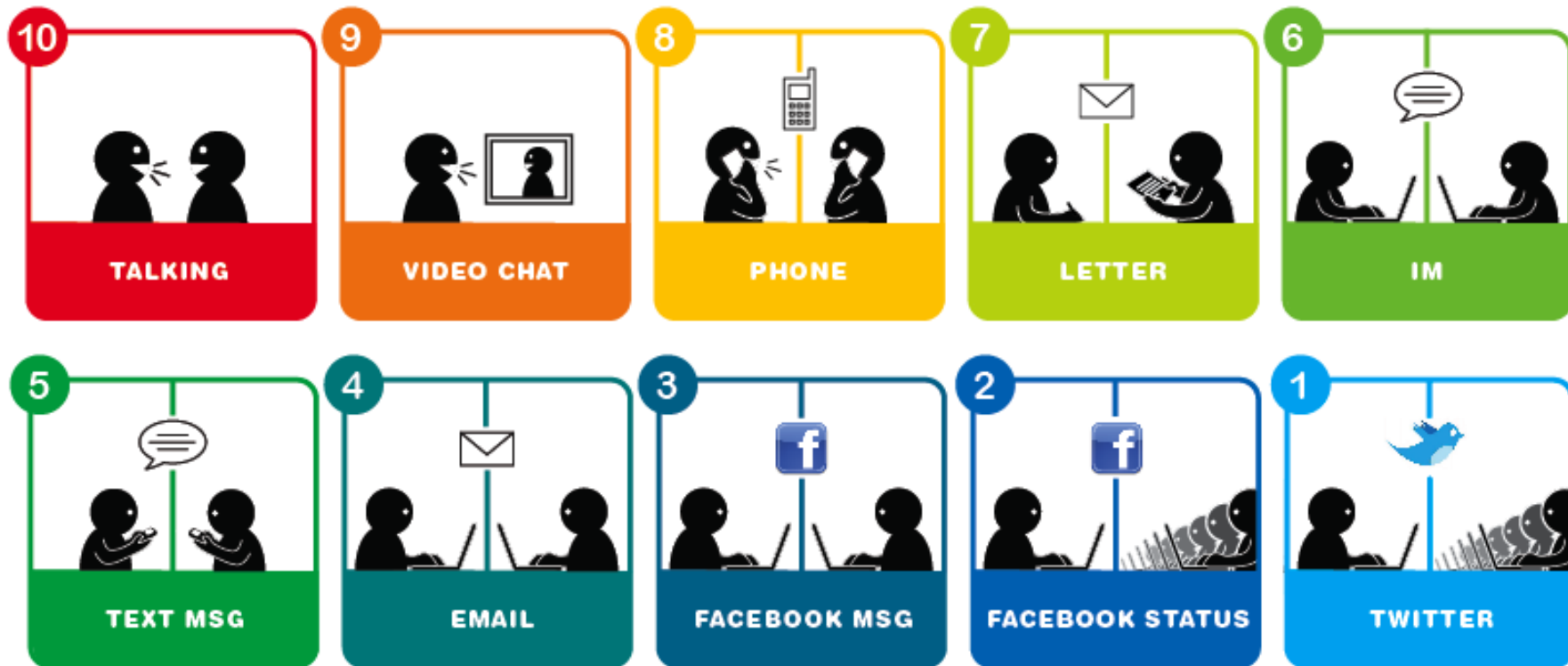
>> Manusia purba tak perlu berpikir tentang hak milik, karena alam telah menyediakan. teknologi juga melakukan hal sama, memudahkan orang saling berbagi.

3. Status Individu

Jaman batu, manusia berinteraksi tanpa batas ruang dan waktu, mereka berkumpul dalam gua-gua, kelompok kecil di alam bebas dan membangun strata strata sosial yang sederhana. Kini email, teleconference, videocall, blog dan sebagainya membuat sesama manusia dalam dunia cyber saling berhubungan secara sederhana dan menembus sekat-sekat strata sosial yang dibangun dalam jaman modern.

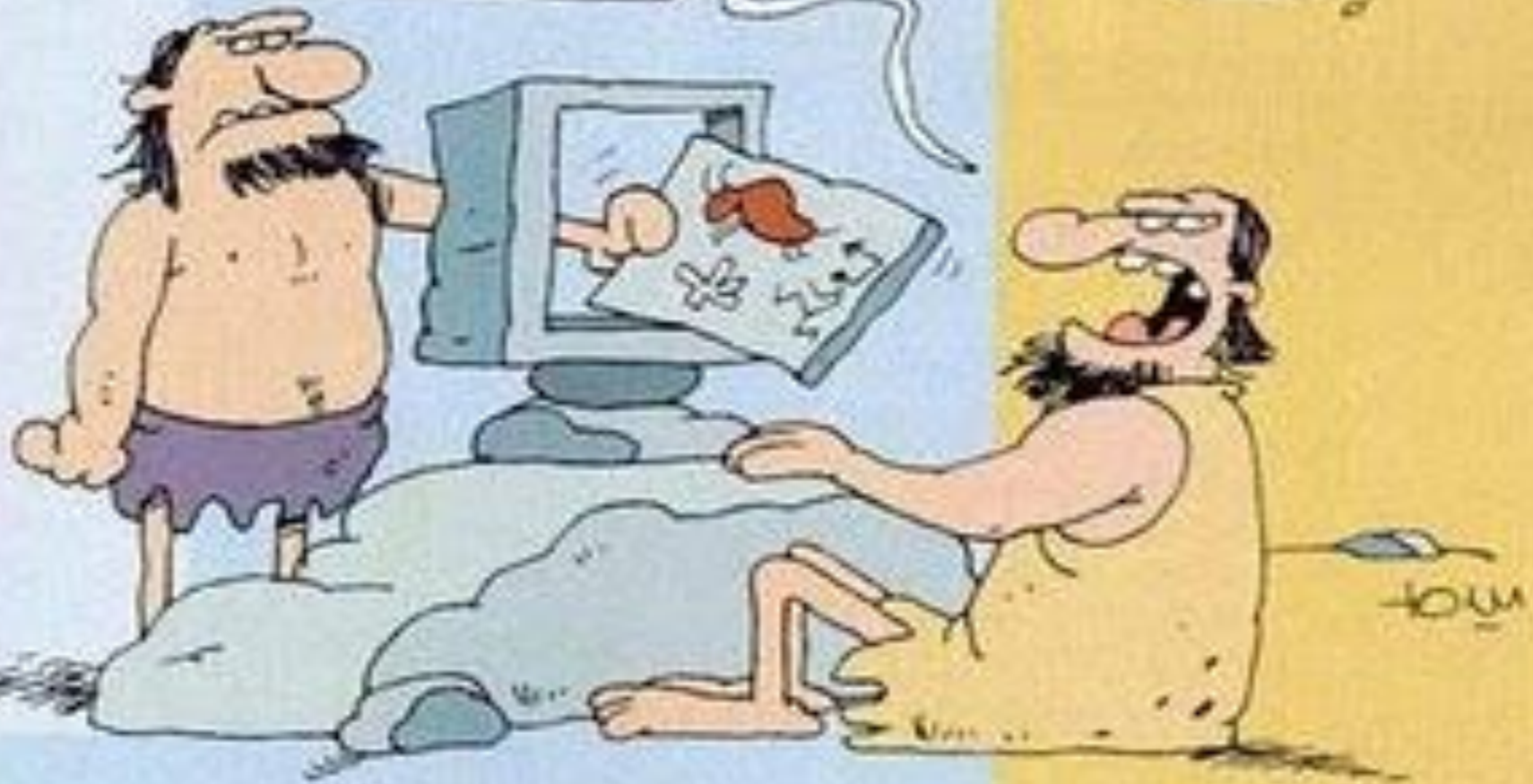
>> Manusia kembali menjadi satuan individu bukan sebagai anggota dari kelompok strata sosial tertentu. masyarakat purba adalah masyarakat tanpa strata sosial, sedang masyarakat cyber menafikkan strata sosial.

10 LEVELS OF INTIMACY IN TODAY'S COMMUNICATION



What is it?

You have new mail!



OK...Print!!



ESENSI INFORMASI DAN TEKNOLOGI INFORMASI

Informasi telah menjadi menjadi ciri dunia modern, terutama karena:

- Pemanfaatan informasi di bidang ekonomi dan dan sosio –politik
- Perkembangan teknologi informasi untuk mendukung proses penciptaan, analisis, penyimpanan, pengkomunikasian, dan penyebaran informasi.



TI di Fakultas Geografi ?



Geotechnologies

Geotechnologies

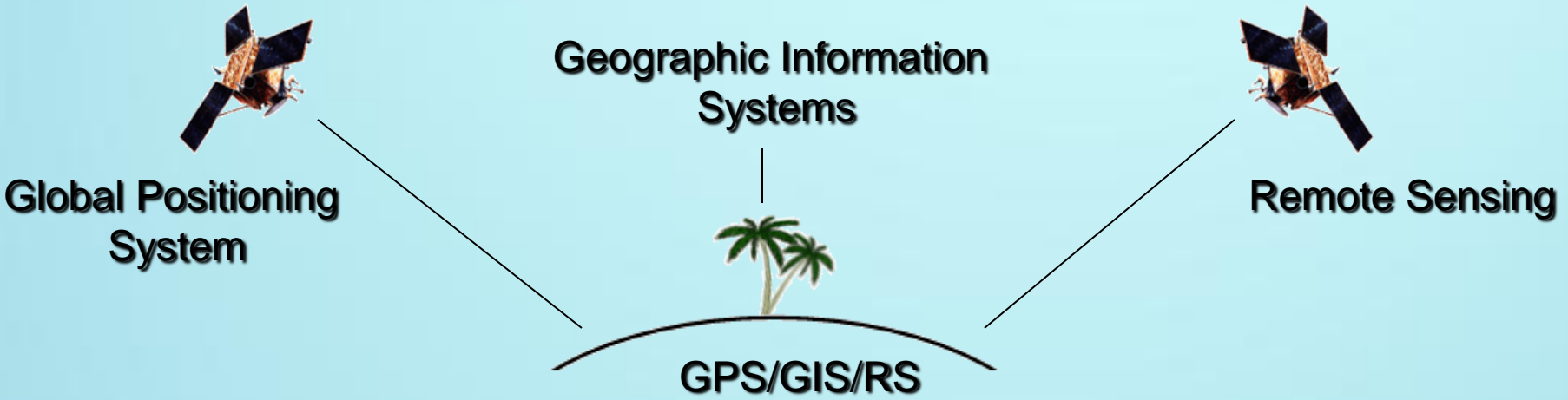
The various hardware and software platforms and peripherals that make possible the electronic creation, storage, manipulation, and analysis of geographic data (e.g., GIS, RS, Disaster Management)

(Nanotechnology)

Geotechnology

(Biotechnology)

Geotechnology is one of the three "mega technologies" for the 21st century and promises to forever change how we conceptualize, utilize and visualize spatial information in research, education and commercial applications



Where

What

Today's Focus
 → Why and So What

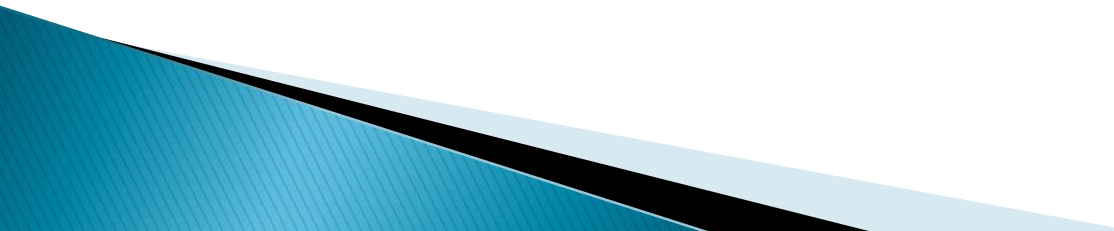
Mapping involves precise placement (delineation) of physical features
 (graphical)

← Descriptive Mapping

Prescriptive Modeling →

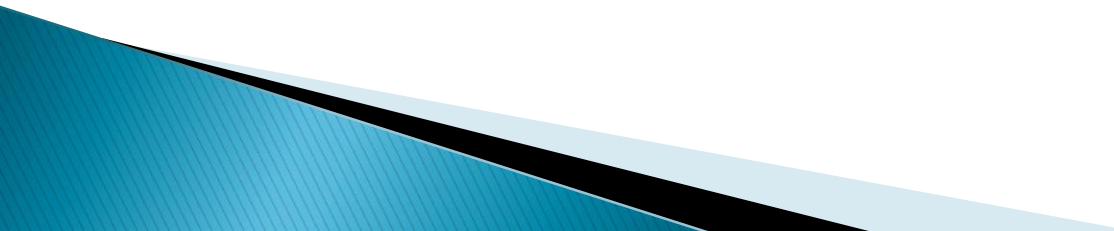
Analysis involves investigation of spatial relationships
 (numerical)

What is the FIELD of Geographic Information Science?

1. GIS (Geographic Information Systems)
 2. Cartography
 3. Remote Sensing (and Satellite Imagery)
 4. GPS (Global Positioning Systems)
 5. Spatial Statistics and Spatial Modeling
- 

Geography and Technology

- ▶ Geography affects us in many ways:
 - Our natural environment
 - Our human environment

 - ▶ Geography has become a high tech discipline
 - Earth Observation
 - Global Positioning Systems (GPS)
 - Geographic Information Systems (GIS)
- 

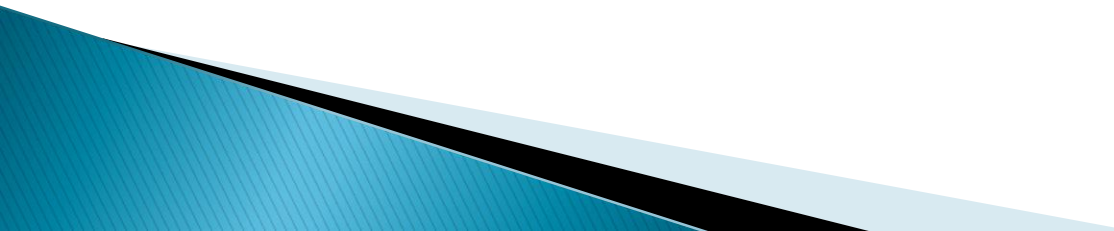
Common analysis functions of GIS

1. Search (thematic search, search by region)
2. Location analysis (buffer, corridor, overlay)
3. Terrain analysis (slope/aspect, drainage network)
4. Flow analysis (connectivity, shortest path)
5. Distribution (nearest neighbor, proximity, change detection)
6. Spatial analysis/statistics (pattern, centrality, similarity, topology)
7. Measurements (distance, perimeter, shape, adjacency, direction)

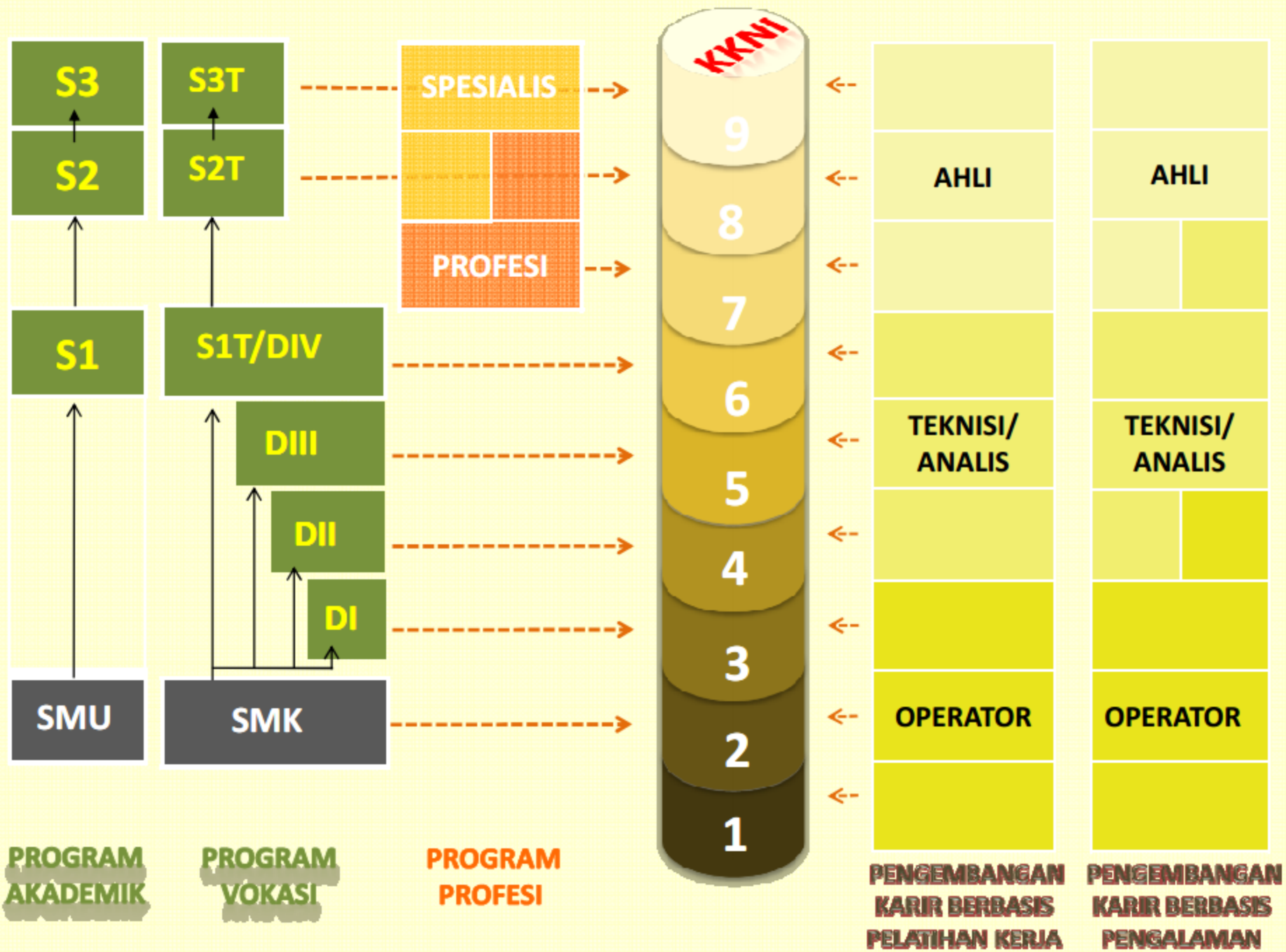
Contemporary Spatial Analysis and Modeling

1. Spatial Autocorrelation
2. Geographically Weighted Regression
3. Spatial Metrics
4. Voronoi Method
5. Multi-criteria Decision Making and Analytical Hierarchy Process
6. Fuzzy Logic
7. Cellular Automata
8. Artificial Neural Network
9. Weight of Evidence
10. Markov Chain
11. Agent Based Model

GIS based on many disciplines and technologies

- Geography
 - Cartography
 - Computer science
 - Mathematics
 - Statistics
 - Remote sensing/GPS/surveying
 - Telecommunications/Internet
 - Operations research/information science
- 

No	Staf	Role	Tanggung Jawab
1	SIG Manager	Management Operational SIG Enterprise	<ul style="list-style-type: none"> • Perencanaandancoordinator visiSIG DEPHUT • Manager untukimplementasi SIG • Pengaturanprioritaspengembangansistem • Koordinatoragensidankegiatanluar • Manager untukkegiatankontraktandenganvendor
2	SIG Analyst Koordinator	Koordinator Teknis System	<ul style="list-style-type: none"> • Koordinator teknis SIG • Koordinator teknis implementasi danservice • Koordinator kegiatan internal • Manager untukkegiatan support teknis sistem • Coordinator untukkegiatan training • Koordinator dan penanggung jawab permasalahan performasistem aplikasi dandatabase
3	Koordinator Service Data	Koordinator Data	<ul style="list-style-type: none"> • Konfigurasi Database • Implementasi Data model • Keamanan Database • Performance tuning • Data backup dan recovery • Replikasi Data • DBMS software upgrades danservice packs • Design Data model • Data validation danquality control topology, domains • Version management • Spatial data management • Data loading, spatial index tuning, DBMS statistics
4	Koordinator Service Aplikasi	si Koordinator Aplikasi	<ul style="list-style-type: none"> • Pengembangan dan Penyelenggaraan standard programming • Pengembangan aplikasi dan pemeliharaan program • Support aplikasi • Performa tuning aplikasi • Pembangunan web service • Administrator web service • End user requirement dan support • Performa dan tuning web service • Deployment dan pengukuran statistic Web services
5	Koordinator Service IT	Koordinator Infrastruktur H/S	<ul style="list-style-type: none"> • Administrator Hardware dan network system • Performa tuning dan troubleshooting sistem • System backup dan recovery • Upgrade Software danservice packs

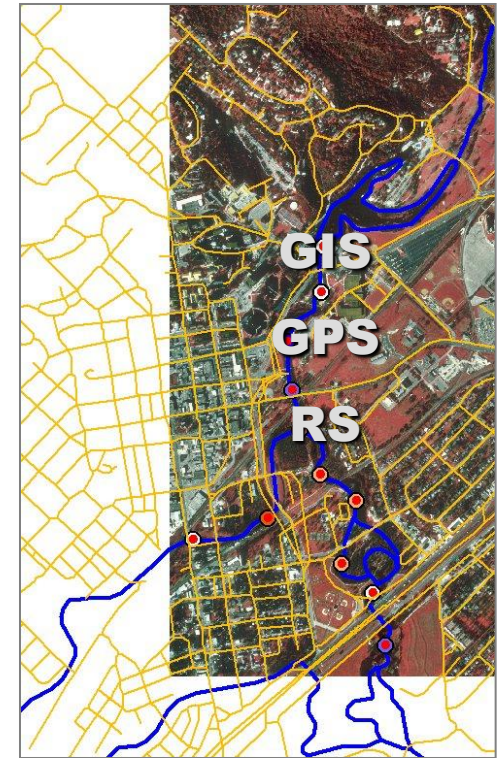


According to Canalys there were approximately 41 million GPS units sold in 2008, and in 2009 the number of GPS enabled cell phones in use had exceeded 27 million.

Points of interest, addresses (lines or points), and aerial or road data is all stored in a database that is accessed by your device.

Geospatial job market booming

- ▶ "In a period of nationwide economic downturn, the geospatial industry offers hope. ...tens of thousands of trained workers are needed to fill positions that are going begging," said Emily Stover DeRocco, head of the US Labor Department's Employment and Training Administration .
- ▶ Geospatial industry expected to grow from \$3 billion in revenues in 1997 to \$21 billion by 2007.



(US Labor Department Calls First Geospatial Technology Industry Executive Forum, Colorado Springs, Colorado, April 10, 2003)

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Academic Research
- ◆ Advertising Management & Sales
- ◆ Advertising Analysis
- ◆ Aerial Photographic Services
- ◆ Aerial Survey Flight Planning
- ◆ Aeronautical Charting Services
- ◆ Air Quality Analysis & Smog Warning Services
- ◆ Airborne Digital Video Imagery Services
- ◆ Airborne Hyperspectral Imaging Services
- ◆ Airborne Laser Topographic Mapping Systems
- ◆ Airborne Lidar Mapping Services
- ◆ Airborne Radar Imaging Services
- ◆ Aircraft Noise Analysis & Reporting Services
- ◆ Airspace & Airport Planning Support
- ◆ Animal Feeding Operations (AFO) Siting & Management
- ◆ Animal Inventory Management Support
- ◆ Animated Walkthrough & Flyby Design Services
- ◆ Aquatic Remote Sensing Services
- ◆ Archaeological Policies Studies Support
- ◆ Archaeological Site Conservation Support
- ◆ Archaeological Site Distributions Modeling
- ◆ Architectural Visualization Services
- ◆ Artificial Neural Network Applications Services
- ◆ Augmented Reality Support Services
- ◆ Automated Map/Chart Production Services
- ◆ Automated Mapping/Facilities Management Automated Vehicle Tracking Services
- ◆ Avalanche Warning Services
- ◆ Aviation Weather Nowcasting & Forecasting
- ◆ Bathymetric Charting Services
- ◆ Benthic or Deep Sea Ecology Studies
- ◆ Biodiversity Gap Analysis
- ◆ Biological Community Assessments
- ◆ Biological Impacts & Ecological Risk Modeling
- ◆ Biomass, Biofuels & Waste Energy Applic. Studies
- ◆ Bird's Eye (Axiometric) View Support Services
- ◆ Business-Domain Expert (BDE) Consulting
- ◆ Cadastral Mapping Services
- ◆ CADD Integrated Facilities Design Services
- ◆ Cartographic Services
- ◆ Change Detection Analysis
- ◆ City Guide Support Services
- ◆ Climate Analysis/Reporting
- ◆ Close Range Photogrammetric Services
- ◆ Coastal & Littoral Zone Management
- ◆ Coastal Habitats Studies

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Coastal Monitoring Services
- ◆ Cogeneration Energy Applications Studies
- ◆ Collaborative Spatial Decision Support
- ◆ Community Network Support
- ◆ Community Outreach & Case Mngmt. Support
- ◆ Comparable Sales Analysis
- ◆ Competitive Intelligence Support
- ◆ Competitor Analysis
- ◆ Computer-Aided Dispatch Support
- ◆ Consumer Spending Analysis
- ◆ Corridor Mapping Services
- ◆ Crime Pattern Analysis
- ◆ Crop Inventory Management Support
- ◆ Crop Scouting Support Services
- ◆ Crop/Soil Spatial Analysis
- ◆ Cultural & Archaeological Tourism Support
- ◆ Cultural Landscape Analysis
- ◆ Cultural Preservation Studies
- ◆ Cultural Resources Management Support
- ◆ Customer Acquisition & Retention Support
- ◆ Customer Base Determination Studies
- ◆ Customer Buying Trend Analysis
- ◆ Customer Information Systems (CIS)
- ◆ Customer Profiling Services
- ◆ Customer Relationship Management (CRM)
- ◆ Customer Service Support
- ◆ Data Acquisitions & Systems Maintenance
- ◆ Data Collection & Analysis
- ◆ Data Conversion Services
- ◆ Data Vendor Services
- ◆ Datalogging Services
- ◆ Delivery/Service Route Planning
- ◆ Demand Forecasting Analysis
- ◆ Demographic Analysis
- ◆ Development Impact Assessments
- ◆ DGPS Reference Station Services (Int. Broadcast)
- ◆ DGPS Reference Station Services (Wide Area Augmentation Systems – WAAS)
- ◆ DGPS Reference Station Services (Wireless)
- ◆ Digital Airborne Topographic Imaging Systems
- ◆ Digital Terrain Modeling (DTM/DEM)
- ◆ Diorama & Scale Model Production Services
- ◆ Direct Mail Marketing Support
- ◆ Disaster Management/Damage Assessment
- ◆ Disaster Mitigation Studies
- ◆ Disaster Planning/Response Support

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Distance Education Support
- ◆ Document Management Systems Support
- ◆ Drive-time Analysis/Modeling
- ◆ Drought Measurement & Forecasting Services
- ◆ Dust & Hail Storm Warning Services
- ◆ Dynamic Event Modeling
- ◆ E911 Dispatch Support
- ◆ Earthquake & Tsunami Warning Services
- ◆ Eco-Tourism Support
- ◆ Economic Base Analysis
- ◆ Economic Development Studies
- ◆ Education Administration Support
- ◆ Ekistics Studies
- ◆ Election Campaign Management Support
- ◆ Electronic Atlas Publishing
- ◆ Embedded Spatial Applications (ASIC) Services
- ◆ Emergency Response Management Support
- ◆ Employee Ridesharing Support
- ◆ Engineering Network Analysis
- ◆ Enterprise Resource Planning (ERP)
- ◆ Enterprise Spatial Application Integration (ESAI)
- ◆ Environmental Impact Studies
- ◆ Environmental Monitoring & Protection Support
- ◆ Environmental Remediation Support
- ◆ Environmental Risk Assessment
- ◆ Epidemiological Research Support
- ◆ Expert Systems Integration Services
- ◆ Exploratory Cartographic Visualization Research
- ◆ Exploratory Spatial Data Analysis (ESDA)
- ◆ Facility & Asset Management
- ◆ Facility Mix Analysis
- ◆ Facility Model analysis/Planning Support
- ◆ Facility Performance Modeling
- ◆ Feasibility Studies Support
- ◆ Field Automation Support Services
- ◆ Financial Analysis Support
- ◆ Fire Growth Modeling
- ◆ Fire Insurance Risk Analysis
- ◆ Fleet & Logistics Management Support
- ◆ Flooding & Mudslide Monitoring & Forecasting
- ◆ Forest Fire Tracking & Forecasting Services
- ◆ Forest Preservation & Harvesting Support
- ◆ Freedom of information (FOIA) Initiatives
- ◆ Geo-indexed Statistical Reporting Services
- ◆ Geo-Targeted Marketing Services
- ◆ Geodata Collection & Production Services

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Geographic Information Systems (GIS) Services
- ◆ Geographic Risk Analysis Services
- ◆ Geography Education (K-12) Support Services
- ◆ Geologic Surveys & Analysis Services
- ◆ Geospatial Data Modeling (Entity-Relationship-ER)
- ◆ Geospatial Domain Modeling (Unified Modeling Language-UML)
- ◆ Geospatial Independent Software Vendor
- ◆ Geospatial Project Management
- ◆ Geospatial Services Marketing Support
- ◆ Geospatial Services Pattern Language Initiatives
- ◆ Geothermal Energy Applications Studies
- ◆ GIS Applications Programming Services
- ◆ Global Change Research Studies
- ◆ Government (Public Administration) Market Visualization Support
- ◆ GPS Integration Services
- ◆ Ground Control/Truth Services
- ◆ Ground Penetrating Sensing Services
- ◆ Harbors, Jetties & Piers Planning & Maint Support
- ◆ Hardware Sales, Integration & Maint Services
- ◆ Hazard Management & Emer.Planning Studies
- ◆ Hazardous Materials Management Support
- ◆ Health Care Planning & Delivery Support
- ◆ Heat Recovery Applications Studies
- ◆ Heritage Management & Historic Preserv. Support
- ◆ Highway Maintenance Support
- ◆ Housing Search Services
- ◆ Human Resources Management Support
- ◆ Hurricane & Tornado Warning & Alert Services
- ◆ Hydro-Electric Power Studies
- ◆ Hydrodynamic Modeling
- ◆ Hydrographic Survey Services
- ◆ Ice Charting Services
- ◆ Ice Storm Monitoring & Forecasting Services
- ◆ Inertial Survey Services
- ◆ Information Architecture Design Support
- ◆ Infrastructure Management Support
- ◆ Insurance Risk Analysis
- ◆ Integrated Forestry Database (IFDB) Management
- ◆ Integrated Hydrographic Survey Systems
- ◆ Integrated Maritime Surveillance
- ◆ Integrated Marketing Segmentation System
- ◆ Integrated Pest Management Studies
- ◆ Integrated Waste Management (IWM) Systems
- ◆ Intelligent Route Planning Services

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Intelligent Transportation Systems (ITS)
- ◆ Intelligent Vehicle Highway Systems (IVHS)
- ◆ Interactive Dynamic Event Modeling
- ◆ Interactive (3D) Dynamic Event Modeling Services
- ◆ Interactive (Plan View) Dynamic Event Modeling
- ◆ Interactive Decision Mapping Services
- ◆ Internet Geographic White & Yellow Pages
- ◆ Internet Map & Information Services
- ◆ Internet Multi-player Gaming Support
- ◆ Internet Spatial Marketplace Services
- ◆ Intranet Map & Information Services
- ◆ Isochronic Mapping Services
- ◆ Isothermal Contour Mapping Services
- ◆ Knowledge Management Services
- ◆ Land Information Systems (LIS)
- ◆ Land Irrigability Mapping
- ◆ Land Ownership Tracking Services
- ◆ Land Use Analysis
- ◆ Land Valuation/Tax Management Support
- ◆ Landscape Design Services
- ◆ Lifestyle Clustering Analysis
- ◆ Lifestyle Resources Mapping Services
- ◆ Lightning Strike Analysis
- ◆ Litigation/Forensic Support Services
- ◆ Location Based Data Management
- ◆ Locational Quotient Analysis
- ◆ Location Scouting Services (Film & Video)
- ◆ Location Services
- ◆ Location-Allocation Modeling
- ◆ Location-Based Billing Support Services
- ◆ Location-based Mobile Game Support Services
- ◆ Locks & Canals Management Support
- ◆ m-Commerce Support Services
- ◆ Map & Chart Publishing
- ◆ Map Accuracy Assessment Studies
- ◆ Map Animation Services
- ◆ Map Digitizing/Scanning Services
- ◆ Marine Buoys Support & Maintenance Support
- ◆ Marine Navigation & Pilotage Support
- ◆ Marine Remote Sensing Services
- ◆ Marine Weather, Wind/Current Nowcasting & Forecasting Services
- ◆ Market Optimization Analysis
- ◆ Market Research & Segmentation Services
- ◆ Market Selection Analysis
- ◆ Market Survey Analysis

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Market Visualization Support
- ◆ Marketing Automation Support
- ◆ Mass Transit Management Support
- ◆ Master Community Planning
- ◆ Media Planning Support
- ◆ Mortgage Lending Pattern Analysis
- ◆ Multimedia Map Design Services
- ◆ Natural Resource Damage Assessment
- ◆ Natural Resource Extraction Support
- ◆ Network Modeling
- ◆ Nautical Charting Services
- ◆ Ocean Dumping Detection Services
- ◆ Oil Spill Impact & Risk Assessment Modeling
- ◆ Oil Spill Monitoring Services
- ◆ Oil Spills Response & Contingency Planning
- ◆ Online Spatial Services
- ◆ Open Source Initiatives Support
- ◆ Open Standards Initiatives Support
- ◆ Operations & Maintenance Applications Services
- ◆ Orthographic Mapping Services
- ◆ Outdoor Advertisement Placement Support
- ◆ Panoramic Photographic Services
- ◆ Parking Lot Management Support
- ◆ Permit Application Management Support
- ◆ Personal Navigation Services
- ◆ Petroleum Distribution Management Support
- ◆ Petroleum Finding/Drilling Support
- ◆ Petroleum Price Tracking Research
- ◆ Petroleum Well Management Support
- ◆ Photogrammetric Services
- ◆ Photovoltaics Applications Studies
- ◆ Physiographic Mapping Services
- ◆ Pipeline information Systems (PIS)
- ◆ Planimetric Mapping Services
- ◆ Political Boundary Analysis/Redistricting
- ◆ Population Studies
- ◆ Precision Farming Support
- ◆ Prescription Mapping Services
- ◆ Private Land Use Planning
- ◆ Product Sales & Distribution Analysis
- ◆ Productivity/Yield Analysis
- ◆ Professional Engineering Services
- ◆ Professional Survey Mapping Services
- ◆ Promotion Testing Support
- ◆ Property Inventory Analysis
- ◆ Property Valuation Services

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

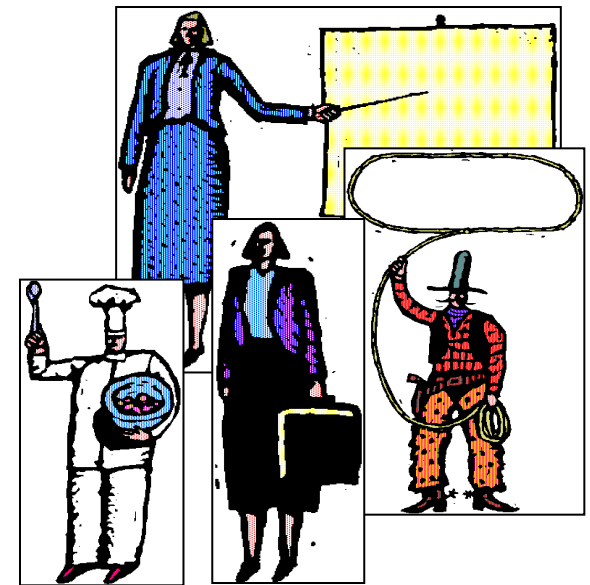
- ◆ Public Event Management Support Services
- ◆ Public Transit Operations Management
- ◆ Real Estate Acquisitions Support
- ◆ Real Estate Appraisal Services
- ◆ Real Estate Atlas Publishing
- ◆ Real Estate Listings Management
- ◆ Real Estate Locator Services
- ◆ Real Estate Management Support
- ◆ Real Estate Market Modeling
- ◆ Real Time Tidal Atlas Services
- ◆ Real-time Vehicle Tracking
- ◆ Red Tide Mapping Studies
- ◆ Regional Planning Analysis
- ◆ Regional Transportation Planning
- ◆ Regulatory Analysis & Reporting
- ◆ Regulatory Compliance Support
- ◆ Remote Collaboration Support
- ◆ Resource Allocation Analysis
- ◆ Response Time Analysis
- ◆ Retail Competitive Analysis
- ◆ Retail Drive Time Analysis
- ◆ Retail Predictive Modeling
- ◆ Retail Product Placement Analysis
- ◆ Retail Site Selection Support
- ◆ Retail Trade Area Analysis
- ◆ Risk Management & Analysis
- ◆ River Crest Forecasting & Flood Assessment Road Map Publishing Services
- ◆ Route/Delivery Support
- ◆ Rural Studies & Design Services
- ◆ Sales Force Automation (SFA) Support
- ◆ Sales Ratio Studies
- ◆ Sales Territory Analysis
- ◆ Satellite Radar Imaging Services
- ◆ Satellite Remote Sensing/Image Analysis
- ◆ Satellite-based Fisheries monitoring
- ◆ Scientific Data Publishing Services
- ◆ Seafloor Classification Studies
- ◆ Search & Rescue Support
- ◆ Sensor Monitoring Support
- ◆ Service Provider Trade Area Analysis
- ◆ Site Design Services
- ◆ Site Evaluation & Modeling
- ◆ Site Location Planning
- ◆ Site Selection Strategic Support
- ◆ Site-Specific Agriculture Support Services

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Site-Specific Nowcasting & Forecasting Weather
- ◆ Social Policy Analysis
- ◆ Social Sector Organization Membership Management Support
- ◆ Social Sector Pro Bono Spatial Services
- ◆ Soil Series Mapping Services
- ◆ Solar Thermal Applications Studies
- ◆ Space Inventory Allocation Support
- ◆ Spatial Application Usability Testing Services
- ◆ Spatial Applications Content Provider
- ◆ Spatial Behavior Data Mining
- ◆ Spatial Cognition Research Studies
- ◆ Spatial Content Provider Services
- ◆ Spatial Data Analysis Services
- ◆ Spatial Database Management Services
- ◆ Spatial Decision Support Systems (SDSS)
- ◆ Spatial Modeling & Simulation
- ◆ Store Optimization Analysis
- ◆ Strategic Loan Planning Support
- ◆ Strategic Planning & Marketing Implementation
- ◆ Street & Highway Construction Management
- ◆ Target Marketing Services
- ◆ Teaching/Training Support
- ◆ Technical Writing & Documentation Services
- ◆ Tele-Presence Support
- ◆ Telecommunication Infrastructure Management
- ◆ Thermal Monitoring Studies
- ◆ Time Series Mapping Studies
- ◆ Title Insurance Support Services
- ◆ Toxic Plume Forecasting
- ◆ Trade Area Definition/Evaluation
- ◆ Traffic Management Support
- ◆ Traffic Route & Flow Optimization Analysis
- ◆ Transportation Network Modeling
- ◆ Transportation Planning & Research
- ◆ Traveler Information System Support
- ◆ Tree Height and Stand Density Studies
- ◆ Trouble/Outage Management Support
- ◆ Urban Crisis Management Support
- ◆ Urban Studies & Design Services
- ◆ Utilities Planning & Research Services
- ◆ Vacant Land Studies
- ◆ Vegetation Vigor Classification Studies
- ◆ Vehicle Tracking Services
- ◆ Video Logging Support Services
- ◆ Virtual Reality Modeling Services (realistic)

Jobs, tasks, and professions using GIS and geospatial technologies...are you ready?

- ◆ Visual Impact & Landform Analysis (Viewshed)
- ◆ Volcano Monitoring Services
- ◆ Volumetric Modeling Services
- ◆ Voyage Risk Assessment Support
- ◆ Wastewater/Stormwater Systems Hydraulic Modeling
- ◆ Water Distribution Systems Management Support
- ◆ Water Quality Assessment Services
- ◆ Water Quality/Pollutant Transport Studies
- ◆ Wave & Tidal Energy Applications Studies
- ◆ Web-based GIS Services
- ◆ Wetlands Classification Studies
- ◆ Wildfire Ecology Studies
- ◆ Wildlife Habitat Suitability Studies
- ◆ Wildlife Tracking Studies
- ◆ Wind Energy Applications Studies
- ◆ Wind Farm Development Support
- ◆ Wireless Cell Locations Siting/Modeling
- ◆ Wireless Location-Based Services (LBS)
- ◆ Work Management Support
- ◆ Zoological Research and Analysis



**Impressive listing.
There are and will be more.**

Source: ESRI 2001

Skilled Workforce

- ▶ Students are stronger in many skill areas
 - Critical thinking
 - Pattern recognition
 - Design
- ▶ Technical expertise higher
 - Programming
 - Database management
 - File management
- ▶ Geographically literate
 - Increased awareness about GIS

SEKIAN