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Interdisciplinary study programs

Vladan Devedzic



Outline

- Interdisciplinary, multidisciplinary, transdisciplinary...
- Examples from the University of Belgrade, Serbia
- Examples from cyber terrorism and cyber warfare



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Interdisciplinary, multidisciplinary, transdisciplinary...

- Intradisciplinary: working within a single discipline
- Crossdisciplinary: viewing one discipline from the perspective of another
- Multidisciplinary: people from different disciplines working together, each drawing on their disciplinary knowledge
- Interdisciplinary: integrating knowledge and methods from different disciplines, using a real synthesis of approaches
- Transdisciplinary: creating a unity of intellectual frameworks beyond the disciplinary perspectives

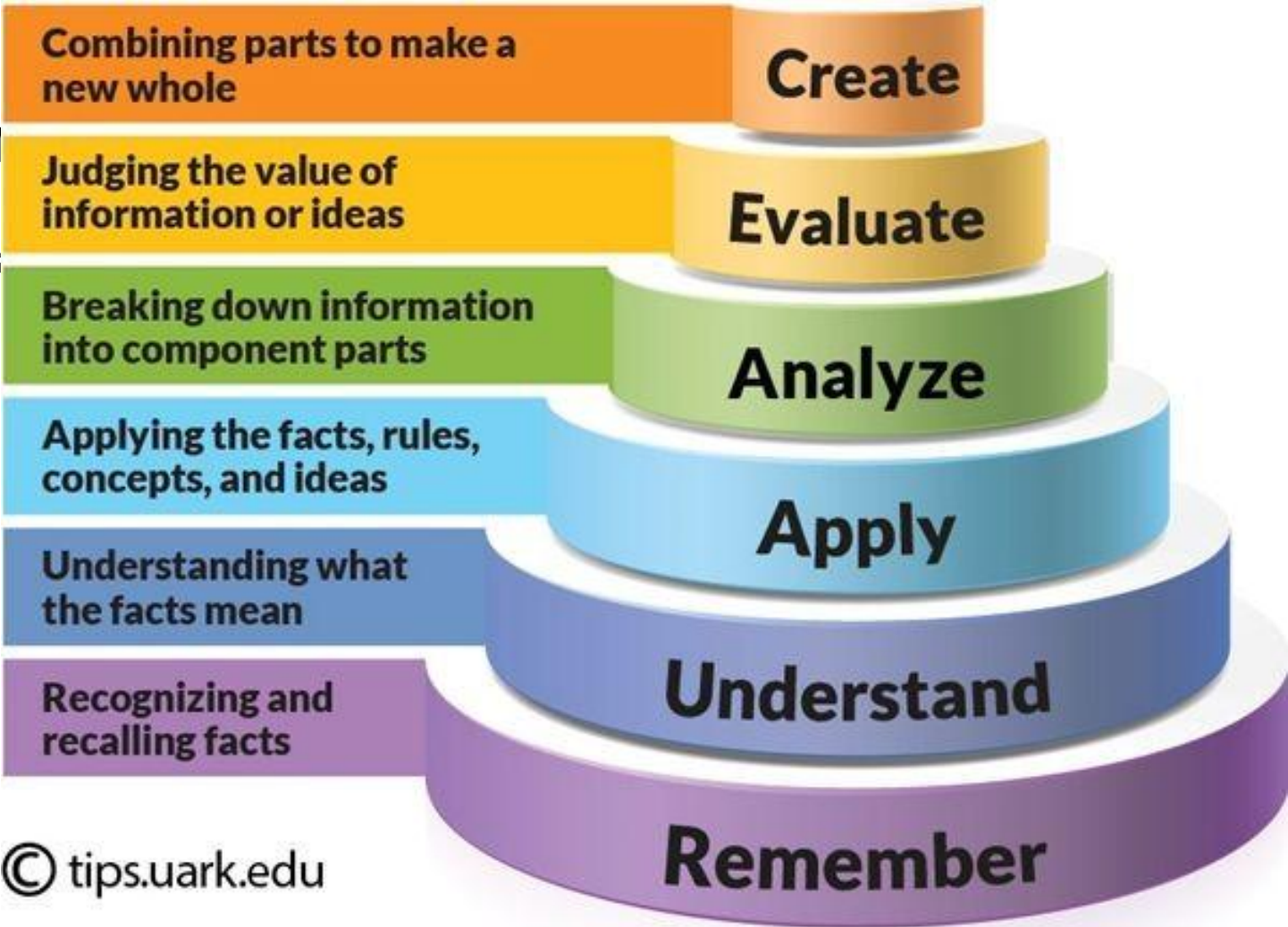
Examples from the University of Belgrade, Serbia

- [Social sciences and computing](#)
- [Intelligent systems](#)

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Examples from cyber terrorism and cyber warfare

- **Cybersecurity** (computer security, or IT security) is the protection of computer systems from the theft and damage to their hardware, software or information, as well as from disruption or misdirection of the services they provide
- Individuals or groups can use the **anonymity afforded by cyberspace** to threaten citizens, specific groups (i.e. with membership based on ethnicity or belief), communities and even the countries

Examples from cyber terrorism and cyber warfare

- Cyber terrorism
 - the use of **Internet-based attacks in terrorist activities**, including acts of deliberate, large-scale disruption of computer networks, especially of personal computers attached to the Internet, by the means of tools such as computer viruses
- Most common methods
 - IP spoofing (forging source IP address with the purpose of concealing the identity of sender)
 - password cracking (repeated attempts to identify a user account and/or password)
 - denial-of-service attacks (crashing and/or flooding services)
 - ...

Examples from cyber terrorism and cyber warfare

- Cyber warfare
 - the battlespace use and targeting of computers, online control systems and networks in warfare
 - offensive/defensive operations pertaining to the threat of cyberattacks, espionage and sabotage
 - short or no warning time, long response time (it is exactly the opposite in traditional warfare!)
 - the most connected nations (like USA) are the most vulnerable
 - much of the critical infrastructure (e.g. communication) is owned and operated by a private sector
- Most common methods
 - massive spying on other countries, on politicians, companies, government offices,...
 - massive theft of intellectual property from corporations
 - recording telephone calls
 - disruption of operation of infrastructure computers and satellites that coordinate other activities
 - disruption of power, water, fuel, communications, and transportation infrastructure
 - cyber propaganda (control of information in whatever form it takes, and influence of public opinion)
 - ...

Examples from cyber terrorism and cyber warfare

- 9/11 Twin Towers Attack
 - Al-Qaeda laptop was found in Afghanistan
 - hits on Web sites that contained "Sabotage Handbook"
 - Al-Qaeda actively researched publicly available information concerning critical infrastructures posted on Web sites
- Ahmedabad Bomb Blast (July 07, 2008)
 - a mail from alarbi_gujrat@yahoo.com was being sent by a group of terrorists
 - unsecured WiFi router from the house of a person named K.H. was used by terrorists
 - 3 more mails were sent after the blast from unsecured WIFI routers

Examples from cyber terrorism and cyber warfare

- 26/11 Mumbai Attack (November 26-29, 2008)
 - terrorists communicated with handlers in Pakistan through Callphonex using VoIP
 - the accused communicated to terrorists through kharak_telco@yahoo.com, accessed from 10 different IP addresses
- Blackout day (August 14, 2003)
 - attacks on power lines and plants in NYC, by a virus named BLASTER
- Food production threats
 - remotely accessing the processing control systems of a cereal manufacturer, changing the levels of iron supplement, and sicken and kill the children of a nation enjoying their food
 - that cyber terrorist will then perform similar remote alterations at a processor of infant formula

Examples from cyber terrorism and cyber warfare

- Grand theft of Sony Pictures' data (Nov 24, 2014)
 - creepy red skeleton on the computer screen of the CEO of Sony Pictures Studio
 - data stolen: vital trade secrets, yet to be released movie scripts, salary and contract information, personal information from thousands of Sony employees,...
 - data destroyed: thousands of hard drives and servers wiped out
 - B. Obama and FBI got involved, since in the end it was not just Sony - it was a first-class national security incident and a sneak preview of a cyber warfare
 - attributed to the government of North Korea
- Computer worm input in the US military base in the Middle East (2008)
 - malicious code implanted into a US military server by a foreign intelligence and spread out
 - all information has been delivered to a foreign military server for months before Pentagon discovered it!
 - the worst publicly revealed breach in the US military history

Examples from cyber terrorism and cyber warfare

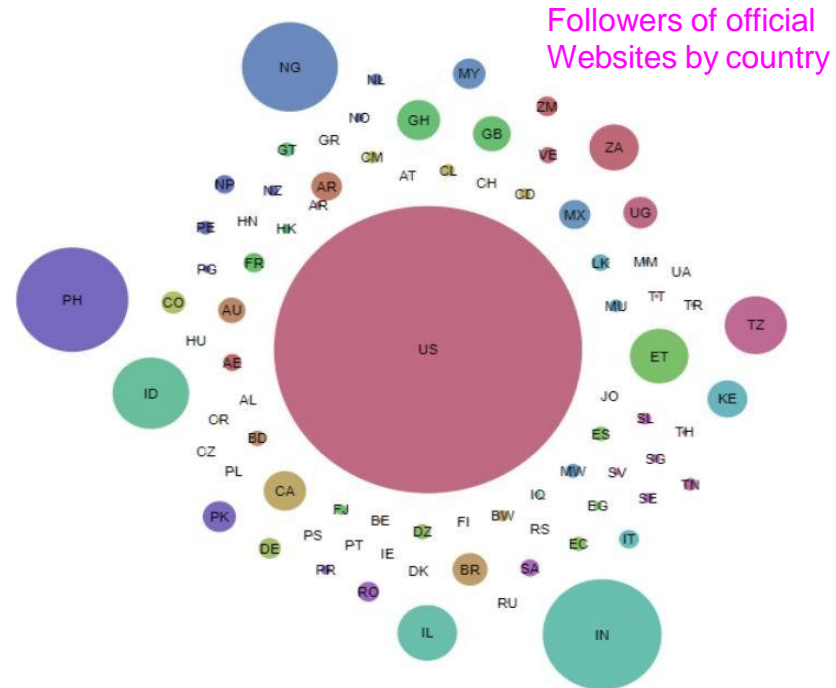
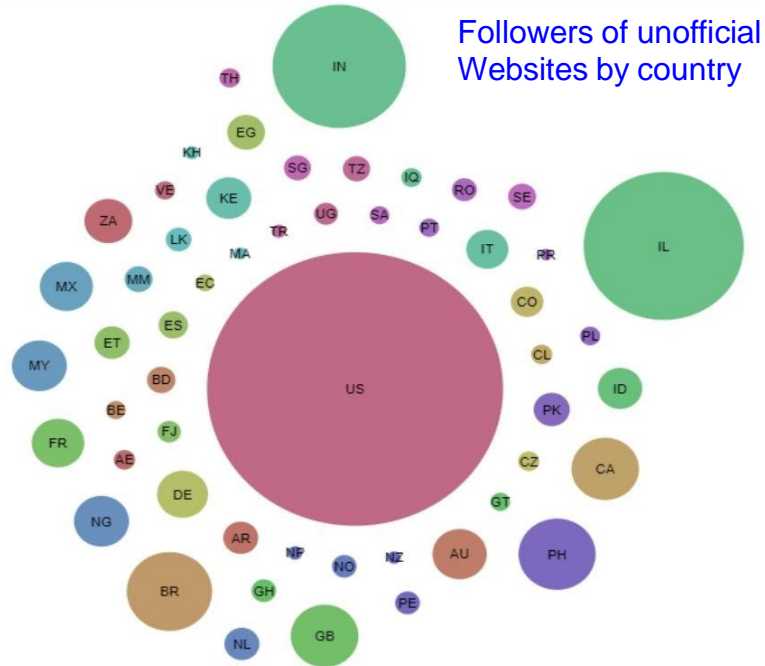
- Example master thesis:

New Internet technologies and foreign propaganda (M. Krstic)

- despite important changes in the forms, a large number of essential characteristics of foreign propaganda remains unchanged with regard to traditional patterns
- there is no radical change in propaganda due to the use of new Internet technologies
- case study: foreign propaganda of the state of Israel during the *Pillar of Defense* operation (2012)
 - identify relevant Facebook groups and similar Web communities (the Netviz application)
 - analyze content posted by official (state) and unofficial actors
 - identify indicators of sharing relevant content (likes, follows,...)
 - identify typical users (targeted subjects), taking into account differences in technologies used and languages typically spoken by the users
 - ...

Examples from cyber terrorism and cyber warfare

- Example master thesis:
New Internet technologies and foreign propaganda (M. Krstic)



Examples from cyber terrorism and cyber warfare

- Examples of hacking UB Websites
 - hacking a research group Website (GOOD OLD AI)
 - hacking an EU project Website (GRASS)
 - ransomware at Dropbox (GRASS)
- *Legal [hacking apps](#)*
- Cyberthreats of tomorrow can be much more scary than those of today
 - today, it is mostly about stealing our credit card information and information from our computers
 - tomorrow, it can be about stopping our cars, our communication lines, our vital industry, poisoning our food, our water, etc.

Examples from cyber terrorism and cyber warfare

- What can we do about it?
 - be cautious about opening email attachments
 - complete software updates
 - create difficult passwords
 - download anti-virus software
 - uninstall unused applications or services
 - ...
 - the more *each one of us* does so, the better
- Modern computer vision systems
 - [example 1](#)
 - [example 2](#)