



Perspectiva Sistémica de la Informática

Presentación: J. Donald R. de Raadt

Asistente: Christian Britto

25 de octubre, 2018

09.00 – 16.00

Resumen

El apresurado desarrollo de la tecnología informática no ha sido acompañado por un correspondiente desarrollo cultural que permita asegurar que esta tecnología beneficie a la humanidad. No se han tomado en cuenta en el diseño informático aspectos sociológicos, éticos, económicos, jurídicos, etc que son imprescindibles para un vida humana culta y sana. Estos aspectos han sido afectados negativamente por la innovación tecnológica inspirada por la expectativa que la humanidad debe adaptarse al desarrollo tecnológico en vez de la tecnología adaptarse al desarrollo humano.

Parte de la responsabilidad de este impacto le atañe al profesional informático, quien se ha subordinado a los intereses comerciales de la empresa y no ha tomado en cuenta el impacto humano que tiene su profesión. Pero también comparten esta responsabilidad aquellos que tienen una misión pedagógica de preparar profesionales informáticos. Hay necesidad de alterar el programa educacional informático para incluir una dimensión más humana. No se trata simplemente de añadir al currículo ramos como la sociología o la ética; se necesita más. Se necesita un marco científico y educacional que presente la informática como un aspecto integral de la cultura humana y entrelazada con otros aspectos – sociológicos, éticos, históricos, etc – que debe armonizarse para beneficiar la humanidad. La investigación de esta armonía cultural y sistémica es el tema central de este seminario. Investigaremos como la cibernética en la naturaleza contribuye as su vitalidad y como sus principios integrados en el marco de la teoría general de sistemas pueden proveernos con una visión más humana en la educación del profesional informático.

Examinaremos temas que forman parte del libro *Information and Managerial Wisdom*¹, que has sido un texto base para programas educacionales informáticos en Australia, EEUU y en Suecia². Estos temas incluyen:

- I. informática como parte de la cultura humana
- II. retro-alimento cibernético, equilibrio social estable e información
- III. desinformación, misinformación y falsificación
- IV. información y aprendizaje

El seminario incluirá grupos de discusión para darle la oportunidad a los participantes de aplicar los conceptos cibernéticos a problemas actuales relacionados con la tecnología informática. Los participantes recibirán una copia impresa de las dispositivas presentadas durante el seminario.

1 de Raadt, J. D. R. (2015) *Information and Managerial Wisdom*. Second Edition. Melbourne Centre for Community Development. <<http://www.melbourneccd.org/books/imw.pdf>>

2 de Raadt, J. D. R. (1997) Design of an Undergraduate Programme in Informatics and Systems Science. <<http://www.melbourneccd.org/articles/wacra%2097.pdf>>

Notas Biográficas

J. Donald R. de Raadt se ha desempeñado como profesor universitario en Australia, USA y Suecia. En 1993, el gobierno Sueco lo nombró profesor catedrático y por once años dirigió el departamento de informática y ciencias de sistemas en la Universidad Técnica de Luleå. Fue presidente de la Sociedad Internacional de Ciencias de Sistemas (ISSS, USA) y de la Sociedad Sueca de Investigación Operacional (SOAF) y vicepresidente de la Federación Internacional de Investigación de Sistemas (IFSR, Viena). Ha ejercido un extensivo liderazgo internacional en la ciencia y filosofía de sistemas, laborando con un enfoque ético, humanista y comunitario. Es autor de siete libros sobre cibernética y administración, informática, ciencia de sistemas y sobre el cristianismo y la filosofía social. Sus artículos han sido publicado en las principales revistas internacionales de ciencia sistemática y ha participado como conferencista invitado en congresos en Australia, Estados Unidos, Europa y Latino-América.

Christian Maciel De Britto es un sociólogo brasileño. Su investigación científica es la aplicación del pensamiento sistémico multi-modal al desarrollo sostenible de comunidades rurales. Ha hecho uso de su experiencia informática en la industria para desarrollar un atlas social (<http://www.socioatlas.xyz/>) para la colaboración científica en el abordaje de problemas socio-ambientales. Es miembro del grupo de investigación *Epistemología y Sociología Ambiental* y del *Centro de Estudios Rurales de Paraná* (ambos reconocidos por el *Consejo Nacional para el Desarrollo Científico y Tecnológico del Brasil*). También colabora con grupos NGOs como YWAM (*Youth With a Mission*) y *Harvest Foundation* enseñando principios teóricos y prácticos para el desarrollo de la comunidad.

| PROGRAMACIÓN | | |
|--------------------|--|--------------|
| Horario | Temas | Presentación |
| SEMINARIO PARTE I | | |
| 09.00-9.50 | I. Informática como parte de la cultura humana | Donald |
| 9.50-10.20 | discusión: Especialización científica (Ortega y Gasset) | Grupos |
| 10.40-11.30 | II. Retro-alimento cibernético, equilibrio social estable e información y desinf | Donald |
| 11.30-12.00 | discusión: Intervalo de Sucesos e Inestabilidad (Estress) Social | Grupos |
| SEMINARIO PARTE II | | |
| 13.00-13.50 | III. Desinformación y ruido | Donald |
| 13.50-14.20 | discusión: Misinformación, Desinformación y Falsificación | Grupos |
| 14.40-15.00 | IV. Información y aprendizaje (reconocimiento de patrones) | Donald |
| 15.00- 15.30 | discusión: China y el Crédito Social | Grupos |
| 15.30-16.00 | discusión general; cierre | Christian |

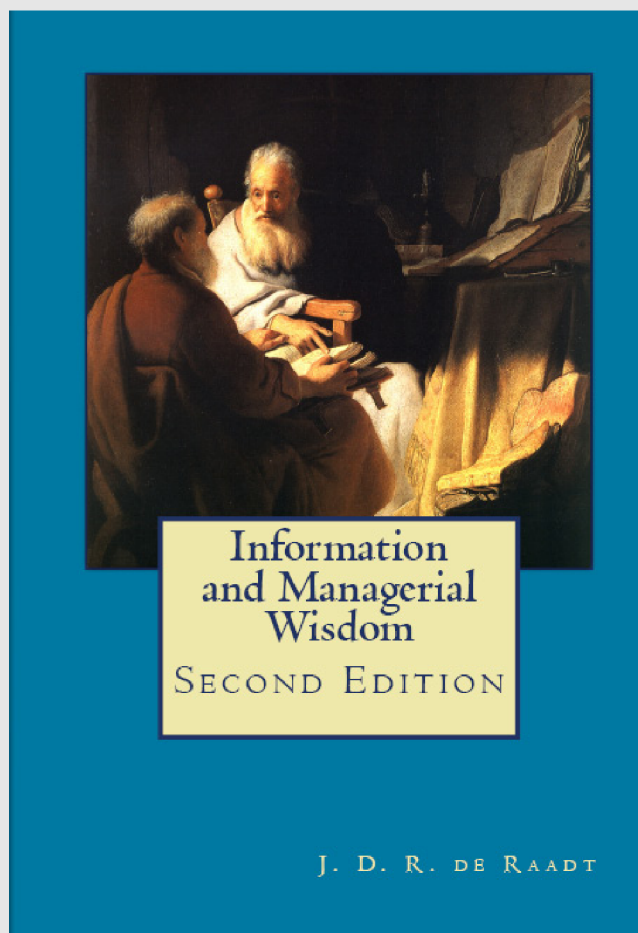
Seminario

Perspectiva Sistémica de la Informática

14º Congreso Brasileiro de Sistemas, 2018

J. D. R. de Raadt
www.melbourneccd.com

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CIBERNÉTICA

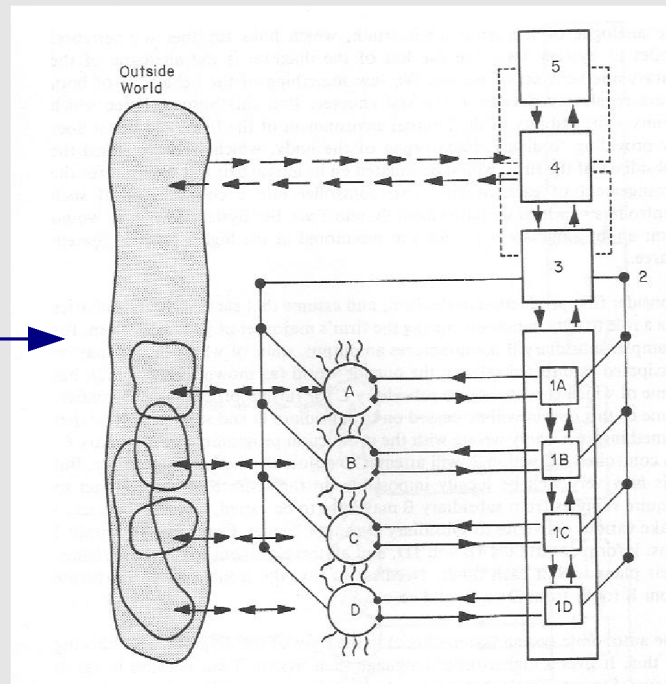
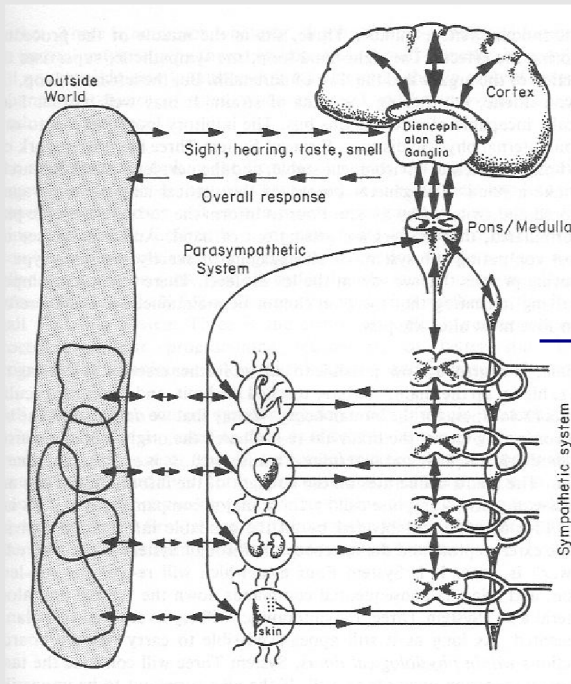
S. Beer: *Brain of the Firm*

W. R. Ashby: *Introduction to Cybernetics*

& *Design for a Brain*

4

Beer Viable (Living) System Model



5

informática sabia:

- ciencia responsable
 - ciencia culta
 - ciencia educada

6

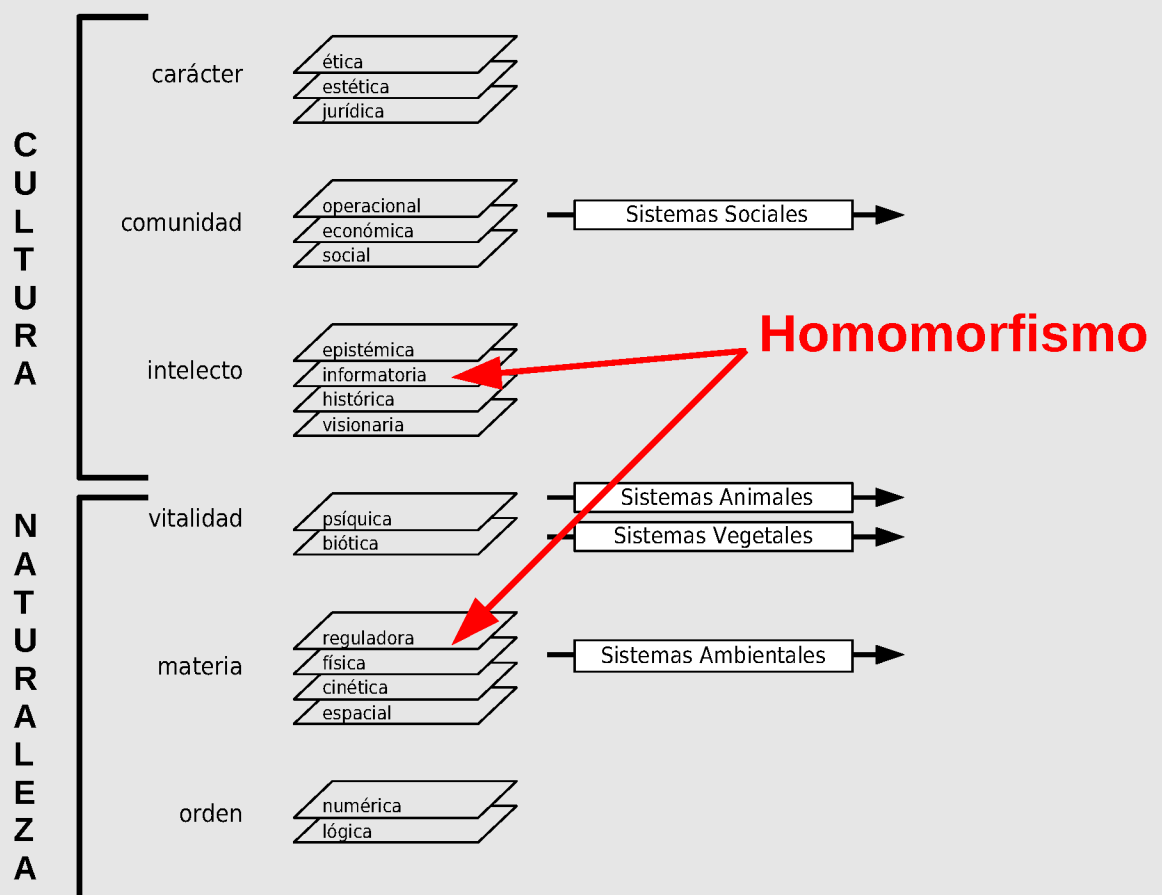
FILOSOFÍA: LA GRAMÁTICA DE LAS CIENCIAS

Herman Dooyeweerd

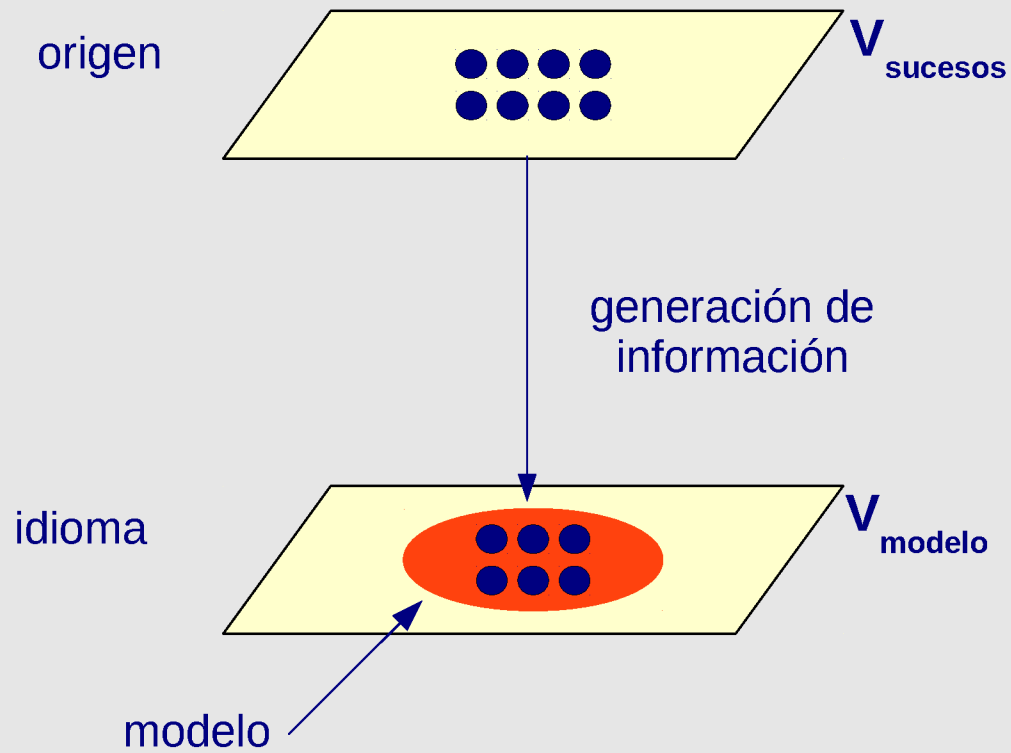
Filosofía Erasmista

7

marco sistémico multi-modal



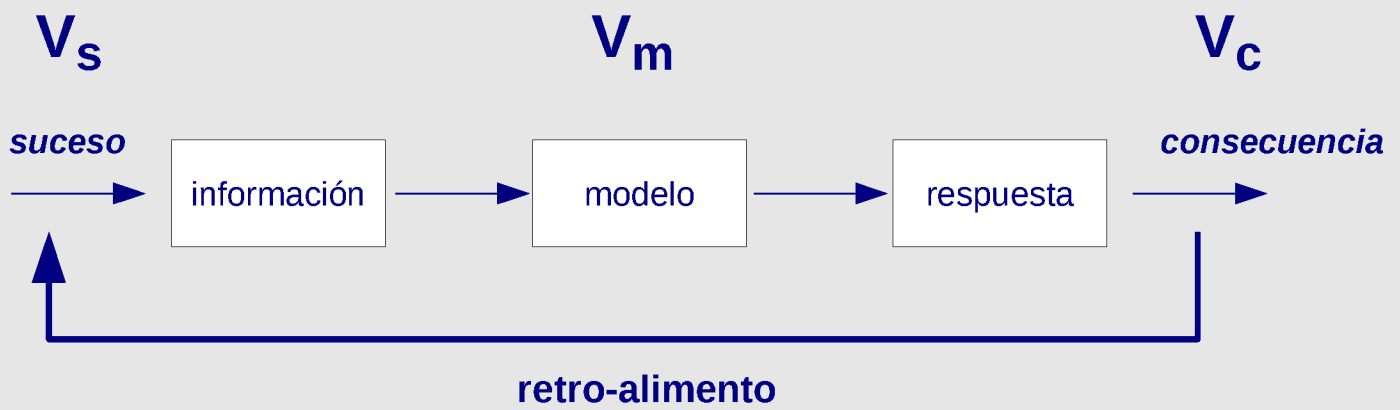
8



9

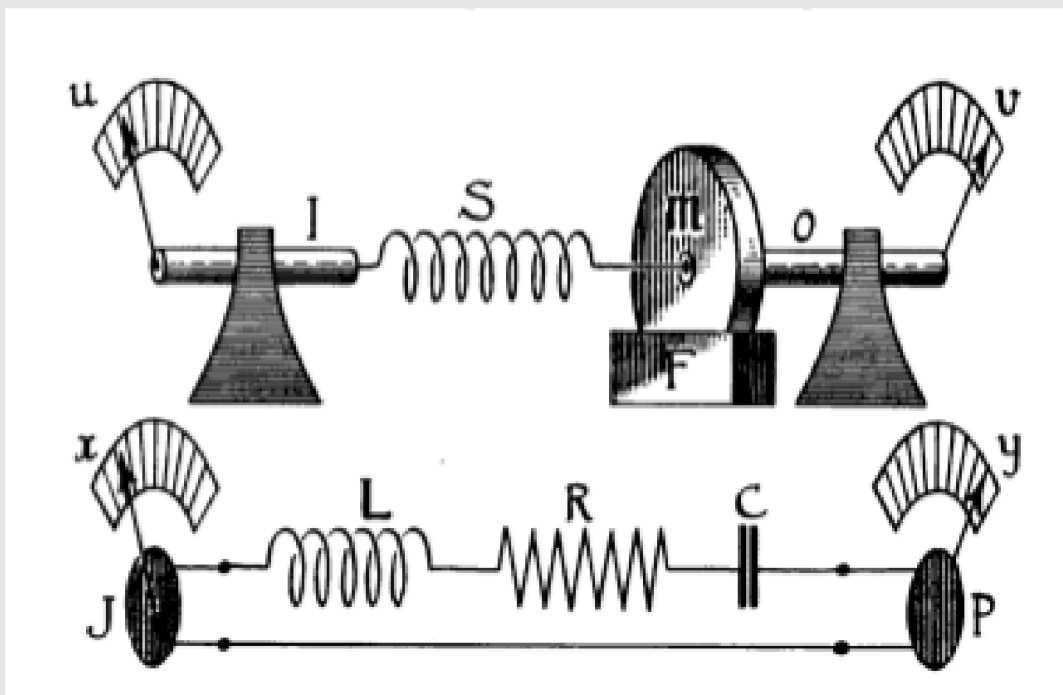
índice de información:

$$T = V_m / V_s$$



11

maquina física y eléctrica de Ashby



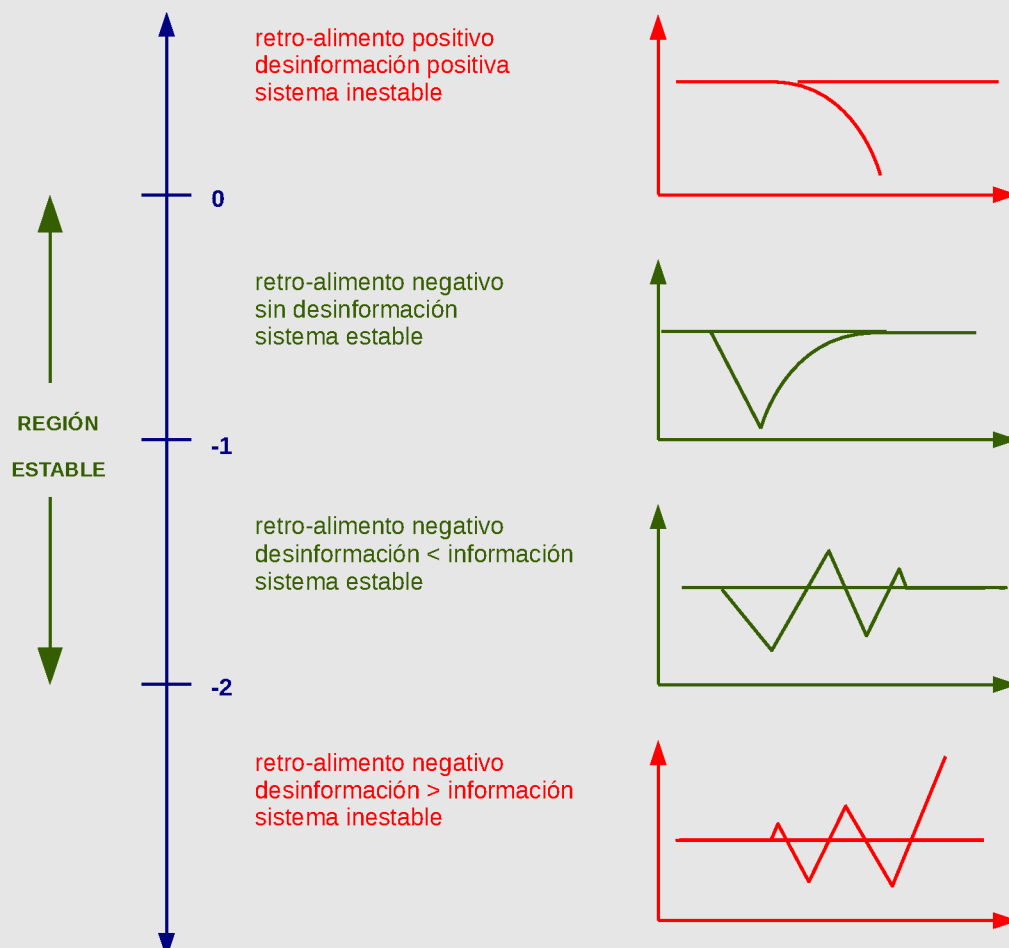
12

Ley de Ashby:

$$V_c = V_s - V_m$$

$$= (1 - T) V_s$$

13



14

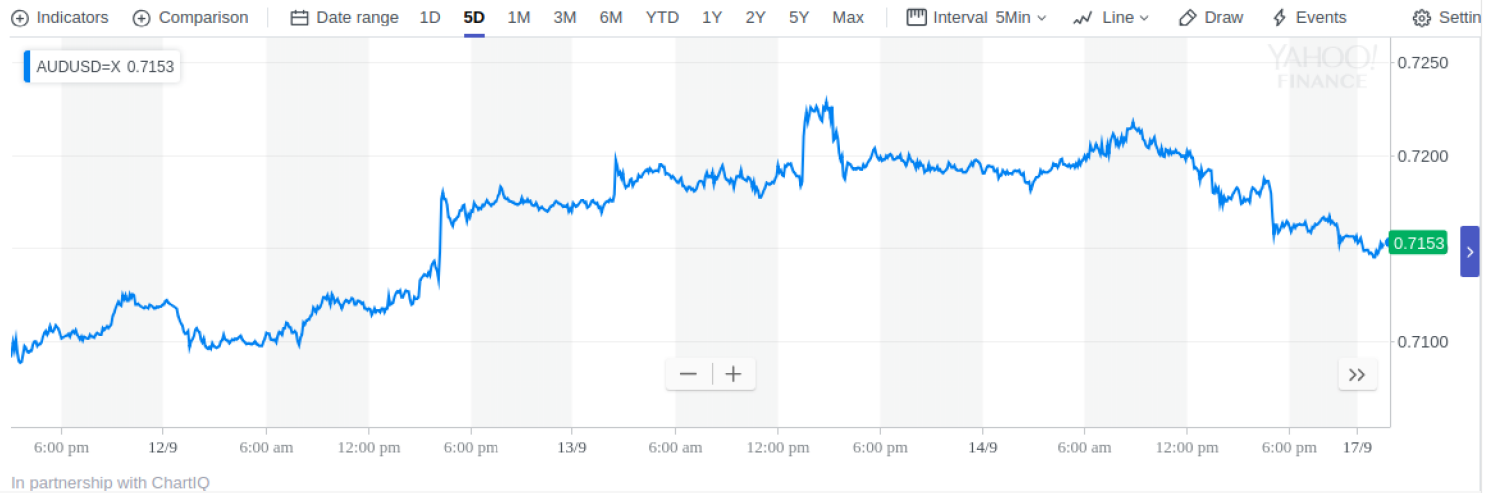
retroalimento negativo $-1 < T < -2$

AUD/USD (AUDUSD=X) [Add to watchlist](#)

CCY - CCY Delayed price. Currency in USD

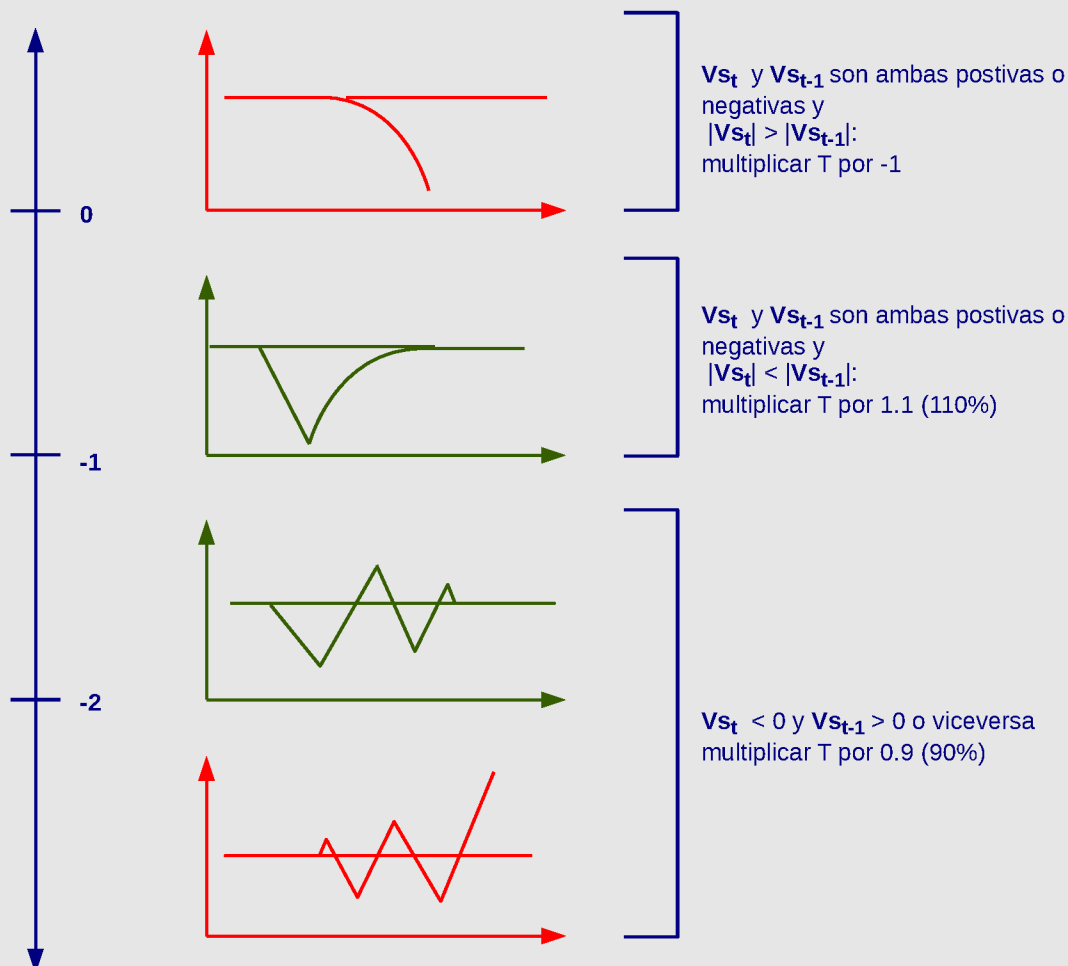
0.7154 +0.0004 (+0.05%)

As of 1:50AM BST. Market open.



15

reconocimiento de formas



16

lapso

AUD/USD (AUDUSD=X) [Add to watchlist](#)

CCY - CCY Delayed price. Currency in USD

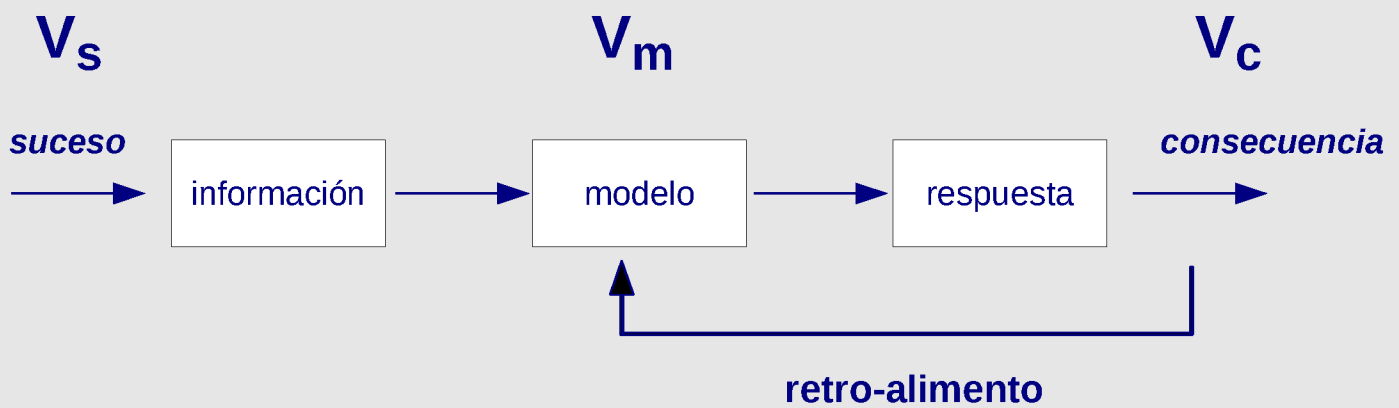
0.7154 +0.0004 (+0.05%)

As of 2:33AM BST. Market open.



17

aprendizaje



18



XII. A BARBÁRIE DO "ESPECIALISMO"¹

(1) Pois bem: o homem de ciência atual é o protótipo do homem-massa. E não por casualidade, nem por defeito unipessoal de cada homem de ciência, mas porque a técnica mesma - raiz da civilização - o converte automaticamente em homem-massa; quero dizer, faz dele um primitivo, um bárbaro moderno...

(2) Mas o desenvolvimento da física iniciou uma faina de caráter oposto à unificação para progredir, a ciência necessitava que os homens de ciência se especializassem. Os homens de ciência, não a ciência. A ciência não é especialista. Ipso facto deixaria de ser verdadeira. Nem sequer a ciência empírica, tomada na sua integridade, é verdadeira se a separamos da matemática, da lógica, da filosofia. Mas o trabalho nela tem de ser – irremissivelmente – especializado...

(3) geração após geração, o homem de ciência tem sido constrangido, encerrado num campo de ocupação intelectual cada vez mais estreito... em cada geração o científico, por ter de reduzir sua órbita de trabalho, ia progressivamente perdendo contato com as demais partes da ciência, com uma interpretação integral do universo, que é o único merecedor dos nomes de ciência, cultura, civilização européia.

(4) convém repisar a extravagância deste fato inegável: a ciência experimental progrediu em boa parte mercê do trabalho de homens fabulosamente medíocres, e menos que medíocres... A razão disso está no que é, ao mesmo tempo, vantagem maior e perigo máximo da ciência nova e de toda civilização que esta dirige e representa: a mecanização. Uma boa parte das coisas que é preciso fazer em física e em biologia é faina mecânica de pensamento que pode ser executada por qualquer pessoa. Para os efeitos de inúmeras investigações é possível dividir a ciência em pequenos segmentos, encerrar-se em um e desinteressar-se dos demais. A firmeza e exatidão dos métodos permitem esta transitória e prática desarticulação do saber. Trabalha-se com um desses métodos como com uma máquina, e nem sequer é forçoso para obter abundantes resultados possuir idéias rigorosas sobre o sentido e fundamento deles. Assim a maior parte dos científicos propõem o progresso geral da ciência encerrados num nicho de seu laboratório, como a abelha no seu alvéolo.

(5) O especialista "sabe" muito bem seu mínimo rincão de universo; mas ignora basicamente todo o resto... Devemos dizer que é um sábio ignorante, coisa sobremodo grave, pois significa que é um senhor que se comportará em todas as questões que ignora, não como um ignorante, mas com toda a petulância de quem na sua questão especial é um sábio.

(6) O resultado mais imediato desse especialismo não compensado tem sido que hoje, quando há maior número de "homens de ciência" que nunca, haja muito menos homens "cultos" que, por exemplo, em 1750. E o pior é que com esses perdigueiros do forno científico nem sequer está garantido o progresso íntimo da ciência. Porque esta necessita de tempo em tempo, como orgânica regulação de seu próprio incremento, um trabalho de reconstituição, e, como eu disse, isso requer um esforço de unificação, cada vez mais difícil, que cada vez complica regiões mais vastas do saber total.

¹ Ortega y Gasset, José & (2005) A Rebelião das Massas. Traduzido por Herrera Filho. Edição eletrônica por Ridendo Castigat Mores. <<http://livros01.livrosgratis.com.br/cv000060.pdf>> (Accessed 20 September 2018).

How modern life affects our physical and mental health

By Hannah Nichols | Published Monday 3 July 2017

Modern day living is a multifaceted compendium of evolving technology and social media. Communication outlets are changing every part of our lives so rapidly that it can be tough to adjust. Are technology and media affecting our physical and mental health?

Technology has improved the lives of many people, with almost [half](#) of adults in the United States unable to imagine life without their smartphone.

The American Psychological Association's [Stress in America Survey 2017](#) shows that 99 percent of adults own an electronic device, around 86 percent own a computer, 74 percent own a smartphone, and 55 percent own a tablet.



The technological and social media advances of the past decade have taken over our lives. Do they affect our physical and mental health?

The survey also reports that between 2005 and 2015, the percentage of adults using social media skyrocketed from [7 percent to 65 percent](#), with usage rates of young adults aged between 18 and 29 increasing from 12 percent to 90 percent in that period.

Rates of technology and social media use are therefore swiftly climbing. Facebook and Instagram alone boast a combined monthly user base of [2 billion people](#).

Recent research by The Associated Press-NORC Center for Public Affairs Research found that teenagers aged 13 to 17 years old have shifted their preferred social media platforms and are now most likely to use Snapchat and Instagram.

Key findings of the survey included the fact that around 76 percent of teenagers use Instagram, 75 percent use Snapchat, 66 percent use Facebook, 47 percent use Twitter, and fewer than 30 percent use Tumblr, Twitch, or LinkedIn.

They also found that although 91 percent of teens use regular text messaging, 40 percent also use messaging apps such as WhatsApp, Kik, or Line.

Social media and text messaging have become an integral part of how individuals interact with their social groups. In fact, for many teenagers and young adults, text messaging and social media communication is now more likely than in-person interactions.

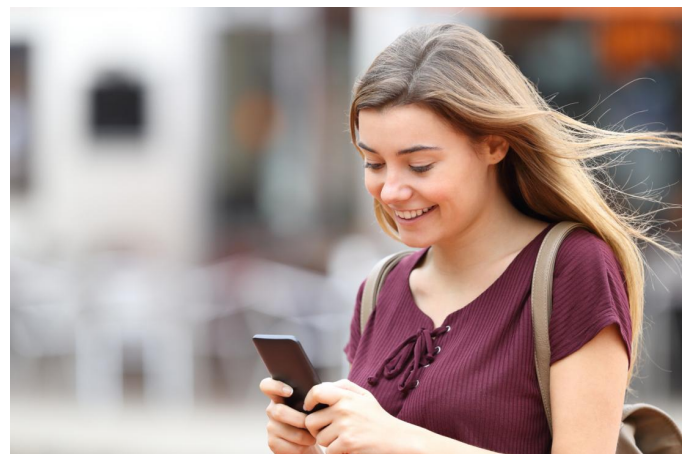
The emergence of the 'constant checker'

The technological and social media advances of the past decade have bred the "constant checker." A constant checker is a person who constantly, almost obsessively, checks their emails, texts, and social media accounts. This profile is synonymous with **43 percent** of U.S. individuals.

Being continuously connected in this way has been linked with higher stress levels.

Moreover, **18 percent** of individuals have identified technology use as a significant source of stress.

On an average day in the U.S., **65 percent** of adults constantly check personal email, 52 percent and 44 percent check texts and social media, respectively, and 28 percent say the same about work emails.



Constant checkers repeatedly check their text messages, emails, and social media.

Stress levels among constant checkers are considerably higher than they are among people who do not engage with technology and social media as frequently.

For example, **42 percent** of constant checkers worry about the effect of social media on their physical and mental health, compared with 27 percent of non-constant checkers.

Furthermore, as a result of technology, more constant checkers than non-constant checkers feel disconnected from their family, even when they are in the same room, and more than one third of constant checkers say that they are unlikely to meet with friends and family in person due to social media.

Digital connectivity and well-being

While many people strongly agree that unplugging or taking a digital detox now and then is important for mental health, in reality, only **28 percent** of those people periodically switch off from technology.

Across the generations, **48 percent** of Millennials, 37 percent of Gen Xers, 22 percent of Boomers, and 15 percent of Matures are worried about the negative effects of social media on their physical and mental health.

Interactions on social media can have a major impact on an individual's well-being and satisfaction. Many studies have observed that more time spent on social media is associated with an increased risk of loneliness and depression, which poses the question: are unhappy people using social media, or does social media use affect happiness?



Using social media for extended periods is associated with depression.



OPINION

Fact checking in a world of misinformation, disinformation and fakery

By RMIT ABC Fact Check director Russell Skelton

Posted Tue 11 Sep 2018, 2:05pm

Donald Trump regularly hijacks the term 'fake news' to dismiss news reports that make him mad.

Politicians and their rusted-on supporters in Australia deploy the term in similar tricky circumstances.

The label fake news has been so thoroughly misused by so many people, in so many different contexts, its meaning has become, well, meaningless.

The worst perpetrators of disinformation are often the first to accuse those who call them to account peddlers of fake news.

Claire Wardle, an authority on the dark side of information ecosystems, believes it is time give the term up. The First Draft News research director from the Harvard Kennedy School in the US argues the more the phrase fake news is bandied around, the more people think it is the media that is fake, not the claims of politicians and the malicious bad actors.

Wardle was the keynote speaker at this week's Navigating the News conference at the University of Tasmania, where she said:

"The term fake doesn't begin to describe the complexity of the different types of misinformation (the inadvertent sharing of false information) and disinformation (the deliberate creation and sharing of information known to be false)."

The role of social media

Disinformation continues to gush through social media outlets spreading hate, prejudice and polarising opinions. A malign, fabricated or just plain dodgy claim can spread on an industrial scale to millions of users within minutes.

The motivations of those who create the content vary. Russian troll factories meddled in the US and French elections; information was weaponised to create social conflict and to destroy the credibility of candidates.

Bogus news sites, in and outside of the US, published fabricated stories designed to discredit and humiliate.

Closer to home, Myanmar officials continue manipulate social media to deny state sanctioned persecution of Rohingya men, women and children.

There are moves to install filters on the social media fire hoses. Google and Facebook are working to identify the manipulators and purveyors of information created to cause political, financial and social harm.

The New York Times recently reported that Facebook had removed 652 fake accounts, pages and groups trying to spread hate speech, seeking to interfere in elections in the US, UK and elsewhere.

Whether this can make a discernible difference remains open to question.

Much is known and plenty is unknown about the dark side of the news ecosystem. The ramifications however, remain profound for legacy news organisations and respected broadcasters like the ABC, CNN and the BBC.

Surprisingly, trust in established US media, where the disruption first emerged and remains acute, has not diminished in the past 12 months, according to Poynter Institute's Media Trust survey.

But trust in social media has.

Fact checking and fake news

Even so, the role of reporters and fact check journalists is changing as the purveyors of fake news become more skilled.

Alexios Mantzarlis, director of the International Fact Checking Network based at the US Poynter Institute (of which RMIT ABC Fact Check is an accredited member), says reporters are coming under pressure to be news verifiers.

Mantzarlis said, in a recent interview, reporters now need to be able to verify photos, assess news updates from seemingly legitimate sources, reverse image search videos and pictures coming from unidentified sources around big news events.

Dealing with the information disorder requires extra diligence and a new skill set. The fast-changing news ecosystem presents considerable challenges for fact check journalism that has traditionally focused on the claims of influential and powerful individuals, organisations and lobby groups seeking to shape public policy.

There are now well over 100 respected fact checking organisations globally — a threefold increase in six years.

At RMIT ABC Fact Check it was never envisioned that our researchers would check the lightning-fast proliferation of false and misleading news spread through bot networks and troll factories.

That herculean task, requires the considerable resources of Facebook, Google, Twitter and Apple news.

A fact check can take weeks of research in consultation with experts before arriving at a verdict.

But that process need not sideline fact check journalism, as there is a key role for fact checkers to play in bringing integrity and authentication to the news flow.

At RMIT ABC Fact Check researchers and fact checkers are working to develop an online "credential" to teach staff and students how to spot fakery and misinformation popping up in social media feeds.

Once perfected, the credential will have general application and hopefully become more broadly available.

For discerning news consumers, the credential will be a valuable addition to the tool box. In the meantime, there are basic rules to follow to avoid being an inadvertent conveyor of misinformation.

Consumers should interrogate the record of individual reporters, programs and news outlets for their biases, accuracy and reliability.

Scanning the URL of a news article, for example, can indicate whether it is bogus and a portal into a darker world.

Fact checkers can become faster at investigating claims and publishing verdicts. The power of the algorithm and automated search engines being developed will allow researchers to find claims and relevant data significantly more quickly.

Rather than focus exclusively on individual claims, researchers will be able to also assess what issues are being contested and frame research around more general claims.

Rusted on beliefs

Polling shows that President Trump's core supporters hold firm to their beliefs no matter how many times the President is fact checked — and that is considerable.

Respected Washington Post fact checker Glenn Kessler, estimates Mr Trump's total number of misleading claims is now approaching the 5,000 mark.

In Australia the same response can be seen in support for Pauline Hanson's One Nation Party. Hanson's claim that the country is being swamped by Muslims has been debunked by The Conversation's fact check and others, but the claim lives on as a talking point and party support has not diminished.

Supporters care less about what leaders say, and more about what they represent.
The emotional connection drives loyalty.

At fact check we do not make judgements about the motivations of those making a claim, only whether there is data or expert opinion to back it up. We seek to promote debate and respectful discourse.

In parliamentary debates our fact checks are regularly quoted. Both sides of Parliament regularly retweet and repost fact checks when they believe they support a particular policy position.

Fact Check engages with audiences through Facebook live. Researchers and experts field questions from followers, a process that promotes knowledge around an issue and a greater understanding of fact checking as a form of journalism.

The most recent broadcast around homelessness involved interviews with rough sleepers and others who had been without a home.

Our next step is to engage not just with audiences, but those we fact check.

Australia seems to have avoided the very worst aspects of the disinformation and misinformation ecosystem that have distorted rational political debate in the US, Europe and Asia.

According to Wardle there are reasons for this: the target audiences are small and monetarising sensational content delivers fewer rewards.

Also, in countries like Australia, the UK and Canada, where there is a trusted national broadcaster publishing news across multiple platforms, consumers have a quick and reliable reference point to judge the reliability of what they see, read and the video content they watch.

Wardle warns that Australia should not be complacent, the scale of disruption may radically change and the federal election — scheduled for early 2019 — will be a major test for everybody involved in navigating the news.

That includes RMIT ABC Fact Check.

In the meantime, for those wanting to hone their fact checking skills, try these steps from the US-based Poynter Institute.

Russell Skelton is the director of RMIT ABC Fact Check



China's social credit system 'could interfere in other nations' sovereignty'

System, criticised as an Orwellian tool of mass surveillance, is shaping behaviour of foreign businesses, report says

Kelsey Munro

Thu 28 Jun 2018 04.00 AEST

China's social credit system, a big-data system for monitoring and shaping business and citizens' behaviour, is reaching beyond China's borders to impact foreign companies, according to new research.

The system, which has been compared to an Orwellian tool of mass surveillance, is an ambitious work in progress: a series of big data and AI-enabled processes that effectively grant subjects a social credit score based on their social, political and economic behaviour.

People with low scores can be banned or blacklisted from accessing services including flights and train travel; while those with high scores can access privileges. The Chinese government aims to have all 1.35 billion of its citizens subject to the system by 2020.

But a new report by US China scholar Samantha Hoffman for the ASPI International Cyber Policy Institute in Canberra claims the system's impact beyond China's borders has not been well understood, and is in fact already shaping the behaviour of foreign businesses in line with

Chinese Communist party preferences. It has the “potential to interfere directly in the sovereignty of other nations”, she said.

She said recent incidents where Chinese authorities pressured international airlines in the US and Australia to use Beijing's preferred terminology to refer to Taiwan and Hong Kong were high-profile examples of this new extension of the social credit system rules to foreign companies.

“The civil aviation industry credit management measures that the airlines are accused of violating were written to implement two key policy guidelines on establishing China's social credit system,” she explains. “Social credit was used specifically in these cases to compel international airlines to acknowledge and adopt the CCP's version of the truth, and so repress alternative perspectives on Taiwan.”

As of 1 January 2018, all companies with a Chinese business licence – a necessity for operating in the country – were brought into the social credit system through the new licence requirement to have an 18-digit “unified social credit code”. Through this business ID number, the Chinese government keeps track of all businesses, reporting transgressions on its National Enterprise Credit Information Publicity System, Hoffman said. The system extends to non-profits, NGOs, trade unions and social organisations after 30 June.

“Companies don't have a choice but to comply if they want to continue doing business in China,” Hoffman told the Guardian Australia.

Sanctions for companies so far have come in the form of fines, she said, citing the example of the Japanese retailer Muji, which was fined 200,000 yuan in May for labelling on products sold in China that listed Taiwan as a country. The fine cited a violation of PRC advertising law banning activity which damages “the dignity or interests of the state”, but the violation was also recorded on the social credit system's National Enterprise Credit Information Publicity System. This listing can trigger further fines from other state agencies, Hoffman said.

It is not clear whether foreign companies have access to the information kept on their social credit record, nor if foreign citizens could find out if their nation's companies have made concessions or changed their behaviour as a result.

Guardian Australia unsuccessfully sought comment from Qantas, which announced earlier this month it would change the language used on its global websites in accordance with the Chinese government's preferred terminology for Taiwan.

Hoffman is a visiting academic fellow at the Mercator Institute for China Studies in Berlin. Her report, *Social Credit: Technology-enhanced Authoritarian Control with Global Consequences*, was published on Thursday by the Australian Strategic Policy Institute, a security-focused thinktank which has urged the Australian government take a harder line on Chinese government interference in its democracy.

The report comes amid a difficult period in Australia-China relations; in the same week Australia's parliamentary committee released a bipartisan report paving the way for the passage of new draft laws against covert, coercive or corrupt foreign interference.

What is the social credit system?

Critics of China's social credit system say it is an Orwellian tool of social monitoring and political repression; but the Chinese government says it is a way of boosting administrative efficiency and encouraging trust and moral behaviour by its citizens.

People can be blacklisted for transgressions such as smoking on trains, using expired tickets or failing to pay fines, as well as spreading false information or causing trouble on flights, according to statements released by China's National Development and Reform Commission in March.

Citizens with high credit scores can access better hotels, rental homes and even schools; while those with low credit scores can be temporarily or permanently banned from taking planes or trains, as happened to 6.15 million people in 2017, on the government's own figures. A pilot version of the scheme run this year in Hangzhou City reportedly saw citizens with high social credit ratings get free access to gym facilities and shorter public hospital waiting times.

On the business side, the Brookings Institute has reported that businesses that pay tax on time and "abide by government demands" will get better loan conditions and easier access to public tenders; noncompliant businesses will face more difficult business conditions.

But some researchers believe its power and reach may be overstated.

Queensland University of Technology researcher Meg Jing Zeng has said that while the social credit system can be used to punish political dissenters such as journalist Liu Hu, it may have positive benefits for Chinese citizens because government officials can be blacklisted for corrupt behaviour. Over 1,100 officials were on restricted lists at December 2017, according to the state media organisation People's Daily.

An academic study of the social credit system released last month by Belgian researcher Rogier Creemers said that while the Chinese government had high ambitions for the system, at present it remained a relatively crude tool.

"It is perhaps more accurate to conceive of the social credit system as an ecosystem of initiatives broadly sharing a similar underlying logic, than a fully unified and integrated machine for social control," he wrote.