System.
hack()

System.hack()
http://www.systemhack.org/

// System.hack() zapis poziva metodu hack nad objektom System.
// if using System.hack() syntax in programming a method hack would be invoked on the object System
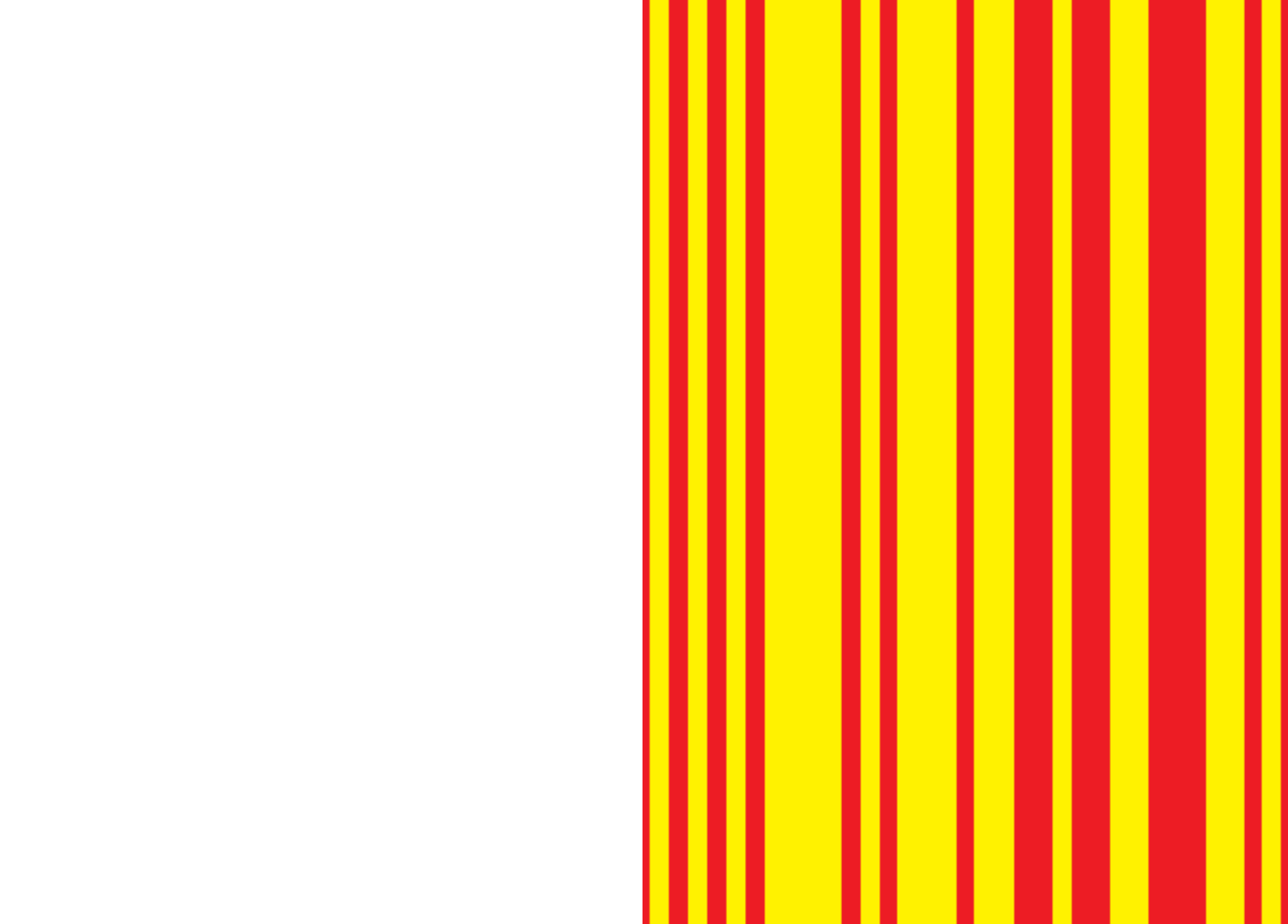
System.hack()

> Paranoja nikada ne pretpostavlja apsolutno nepovje-
renje. U krajnjem slučaju ona vjeruje u vjerovanje
kako nikome ne treba vjerovati. Paranoja, opaki stroj za
konstrukcije, može proizvesti predivne konzistentne tvo-
revine, ne bi li u jednom trenutku ipak poklekla davajući
povjerenje onome kome ne bi trebala - samo kako bi se
krug zatvorio u potvrdi vjerovanja kako ipak nikome ne bi
trebalo vjerovati.

Kada bi svaka paranoja za svoje polazište uzimala
'sumnju u samu sumnju', kapacitet za konstrukciju predi-
vnih konzistentnih tvorevina bi procvjetao. Bio bi to poče-
tak koji bi za svako netaknuto platno i čisti list papira evi-
dentirao sve već na njima sadržane prethodne klišee i us-
tanovljene obrasce, pa bi brisanjem, čišćenjem, struga-
njem, paranjem, paljenjem..., omogućio da do nas iz kaosa
dopre povjetarac koji donosi viziju. (Gilles Deleuze i Felix
Guattari, *Šta je filozofija,* Sremski Karlovci, Novi Sad, Iz-
davačka knjižarnica Zorana Stojanovića, 1995)

Sumnju u sumnju gotovo uvijek za paranoidnog ini-
cira netko drugi (prijatelj, partner, terapeut, policajac, su-
dac...), netko tko sa dovoljne distance evidentira, konfron-
tira i eventualno reprogramira disfunkcionalnost kruga
nepovjerenja (beskonačnog prelaza iz vjerovanja u djelo-
vanje i tako u krug). U slučaju kolektivnih paranoidnih fan-
tazija, zastoje probijaju i reprogramiraju hakovi - momenti
izvrsnosti nesebičnog uvida u disfunkcionalnost krugova
nepovjerenja u koje je društvo zapalo.

System.hack() izložba u svom fokusu ima domenu
tehnologije gdje su mnoge invencije zbog disfunkcional-
nog kruga nepovjerenja i potrebe za nadgledanjem, kon-
trolom, te maksimizacijom profita zastale u imple-
mentaciji koja priječi uvid, razumijevanje, refleksiju, slo-
bodnu razmjenu informacija, te uslijed toga blokira
daljnji razvoj i inovacije na već uspostavljenom.

Kao i pomak iz bilo kojeg drugog kompleksnog pro-
blema, pomak iz takve blokirajuće tehnološke konstelaci-
je čini hak – apstrakciju u primjeni, izvrsnost u programi-
ranju – iznenađujuć, medijski atraktivan, lucidan u kori-
štenju tehnike i tehnologije, duhovit i nenasilan.

Svaki System, koliko god nepovjerljiv prema okolini
bio, ima karakteristiku, skrivenu metodu koja se na njega
samog može primijeniti: System.hack()

System.hack() otvara zatvorene sisteme, a otvorene
čini zauvijek dinamično promjenjivima.

Bilo koja specifična instanca radnog i životnog
okoliša povoljno je sučelje za System.hack(). Iz tog razlo-
ga izabranih šest System.hack()ova izlažu se u reducira-
nom sučelju svakodnevnog života, minimalnom zajednič-
kom nazivniku naših potreba za stanovanjem, neutralnoj
(*sic!*): hotelskoj sobi.

Velike inovacije avangarde uvijek iznova uspijevaju
izokrenuti dominanto predstavljanje povijesti (umjetnos-
ti) i kroz svoju formu i materiju ekstrahirati subalterni
tok povijest, osloboditi budućnost za tu povijest. Povijes-
nim tokom tehnološke inovacije dominirali su veliki voj-
ni, akademski, medijski i tržišni sustavi. System.hack()ovi
su pokušaj da se ekstrahira subalterna povijest inovacije,
pokušaj da se tehnologija otvori za budućnost, buduć-
nost koja će ostati nepredstavljena. *Apt-art* je apstrakcija
muzeja kao stroja povijesti, a ovo je apstrakcija apstrakci-
je: hotelska soba.

Rat svjetova, zvučna kulisa izložbe, stvara atmosferu
koja uz samo trenutak koncentriranog slušanja i čitanja
briše granice između stvarnosti i simulacije na način da
"uništava Svijet [koji smo poznavali] pred našim ušima".

Svijet koji nakon prve uvjerljive simulacije prestaje biti uvjerljiv i kojem se tek na trenutke vraćamo sumnjajući u sumnju u njegovu vjerodostojnost.

U slučaju da želimo provjeriti vjerodostojnost nekog radio programa najlakši način bio bi isti taj radio nazvati telefonom. No, kompleksni sustav upravljanja telefonskim pozivima također je medij za koji je teško utvrditi dovoljnu količinu povjerenja u pouzdanost i vjerodostojnost njegove funkcije. Sustav upravljanja pozivima podređen je mjerljivosti vremena korištenja kako bi se baš svaka upotreba naplatila; profitabilna ideja koja se javila s vremenom, a danas (bez ikakvih sumnji) prihvaćena kao jedini mogući *modus operandi*. Ipak, zatvoreni sustavi upravljanja radoznalom duhu hakera otvaraju se već pri fućkanju prave frekvencije (2600 Hz) u telefonsku slušalicu. Ako je još fućkaljku moguće kupiti u obližnjem marketu na dnu pakovanja hrskavih, zašećerenih kukuruznih i zobenih pahuljica, ništa lakše.

Pred radoznalim hakerskim duhom koji najzanimljivija otkrića rado dijeli sa svim zainteresiranim nemoguće je sakriti bilo što. Tehnologija sakrivanja nikada nije dovoljno kreativna u zaštiti novih tehnoloških kreacija (koliku god da profitnu maržu očekivali kao posljedicu novih tehnoloških kreacija). Za potrebu zaštite profita i zastarjelih poslovnih modela države mora sprovesti restriktivnu zakonsku regulaciju intelektualnog vlasništva i autorskog prava. Restriktivna sprovedba može se upogoniti i u suprotnom smjeru, u smjeru oslobađanja. Time što restriktivni sustav sve više inzistira na restriktivnosti u dodiru s poljem oslobođenog (unutar samog sebe), on inzistira i na sve više oslobađanja.

GNU Opća javna licenca (GNU GPL) Richarda Stallmana poslužila je kao ishodišna točka na bazi koje je izgrađen koncept System.hack() izložbe. GNU Opća javna licenca je ingeniozni hak R. Stallmana koji je tim činom simbolički konstituirao zajednicu u za nju potpuno bizarnom pravnom polju. Dvadesetak godina kasnije ne samo da se ideja slobode u svijetu ideja sačuvala, već je na njoj sagrađena slobodna informacijska infrastruktura koja u svakom segmentu funkcionalnosti nudi alternativu vlasničkim softverskim rješenjima. U području društvenog razvoja ideja slobodne razmjene informacija nema alternative.

Simbioza trke za profitom i zatvaranja informacija ne događa se samo u virtualnom mrežnom okruženju. Znanost sve više otkriva upotrebljivi, operativni, programabilni kod kojim možemo opisati, a i stvarati život. Genetski inženjering danas je samo jedno od polja razvoja u kojem se preslikavaju pozicije moći i dinamika borbe poznata iz svijeta softvera. Hakerske odgovore neki nazivaju 'biološkim građanskim neposluhom', neki kulturnim terorizmom, a neki početkom hladnog rata između korporacija koje proizvode genetski modificirane biljke kojima hakeri suprostavljaju genetski modificirani korov. "*Natural Reality SuperWeed Kit 1.0* (prev. *Prirodna stvarnost - Set za superkorov 1.0*) je 'uradi sam' set koji omogućuje da se proizvede genetski modificirani superkorov, koji je napravljen da napada korporativne monokulture". Heath Bunting biotehnologiju naziva "novim ratištem na kojem se vodi bitka za kontrolu života i zemlje, ali i područjem na kojem se život sam redefinira. Bit svega krije se u konceptima vlasništva i reprezentacije koji su na ovom poprištu ozbiljno dovedeni u pitanje".

Iako paralelno s proizvodnjom i industrijom vlasničkog softvera raste i razvija se proizvodnja slobodnog softvera, korporacije se nisu pomirile sa zatečenim stanjem. Uz proizvodnju novih restriktivnih zakonskih akata, korporacije razvijaju i tehnologije kontrole i zaštite svojih proizvoda (npr. *Digital Rights Management*, *trusted computing*...). U isto vrijeme, hakerski duh ne miruje, svaki uređaj s vremenom biva oslobođen. Ponekad uz pomoć osciloskopa i *'reverse'* inženjeringa (Linux na Xboxu), a ponekad samo uz pomoć stvarčica nadohvat ruke poput vodootpornog flomastera ili stisnute tipke Shift. Tek tako da nas usput podsjeti kako je lako biti iznenađujuć, medijski atraktivan, lucidan u korištenju tehnike i tehnologije, duhovit i nenasilan.

Katalog opisa radova (u vašim rukama) i eseja inspiriranih izabranim System.hack()ovima napisan je kao *'Table of contents:'* izložbe. Osvrnite se, System.hack()ovi su oko vas...

Happy hacking!

System.hack(1,"elektronički mediji","Orson Welles – Rat svjetova")
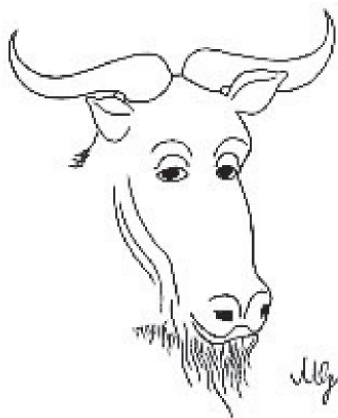System.hack(1,"broadcasting", "Orson Welles – War of the Worlds")

System.hack(2,"telekom", "Captain Crunch – zviždaljka")
System.hack(2,"telecom", "Captain Crunch – whistle")

System.hack(3,"zakon o autorskom pravu","Richard Stallman – GNU Opća javna licenca")
System.hack(3,"copyright law", "Richard Stallman – GNU GPL")

System.hack(4,"živi svijet","Heath Bunting – Superweed Kit 1.0")
System.hack(4,"biota","Heath Bunting – Superweed Kit 1.0")

Natural Reality

Natural Reality SuperWeed kit 1.0

SuperWeed Kit 1.0 is lowtech DIY kit capable of producing a genetically mutant superweed, designed to attack corporate monoculture.

This bag contains a mixture of naturally occuring and genetically mutated (GM) Brassica seeds (e.g. Turnip, Mustard, Oilseed Rape). If these seeds are allowed to germinate and cross pollinate, a SuperWeed will be created that will be resistant to current herbicides (e.g. Monsanto's Roundup™), thus not only threatening the profitability of ...ventional and GM Brassica crops, but also ...bicide production and distribution.

System.hack(5,"zaključavanje", "Michael Steil – projekt Linux na Xboxu")
System.hack(5,"locking", "Michael Steil – Linux On Xbox")
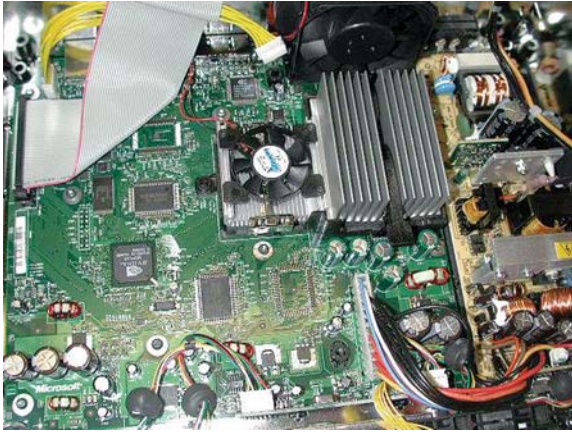
System.hack(6,"zaštita", "Anonimni autor – set za zaštitu CD-a [marker / *shift* tipka]")
System.hack(6,"protection", "Anonymous – CD Protection Kit [marker / shift key]")

System.hack()

> Paranoia never implies absolute mistrust. In the last instance it believes in the belief that no one should be believed. Paranoia, that mean construction machine, can produce wonderfully consistent constructs, only to give in at some moment by placing its trust into someone it shouldn't – thus closing the circle with the confirmation of the belief that no one should be believed after all.

If every paranoia would start from 'doubting the doubt', the capacity for constructing wonderful consistent constructs would flourish. It would be just a start, detecting for every pristine canvas and clean sheet of paper all the previous clichés and established patters already contained in them, so that through the acts of erasing, cleansing, scraping, tearing, burning... a gentle, vision instilling breeze from the chaos could reach us. (Gilles Deleuze and Felix Guattari, *What is Philosophy?* Columbia University Press, New York, 1995)

Doubting the doubt is for the paranoid almost always induced by someone else (a friend, partner, therapist, policemen, judge...), by someone who is detached enough to be able to detect, confront and maybe re-program the dysfunctionality of the cycle of mistrust (i.e. of the infinite passage from belief to act and back). And when it comes to collective paranoid fantasies, the paralyses can be broken and reprogrammed by hacks – moments of excellence in the selfless insight into the dysfuncionality of closed cycles of mistrust that society has become bogged down in.

The System.hack() exhibition focuses on the domain of technologies where many an innovation falls victim to the dysfunctional cycle of mistrust and need for surveillance, control and profit-maximization, becoming paralyzed in an implementation precluding insight, understanding, reflection, free exchange of information and thus effectively blocking up further development and innovation for the benefit of that which has been already achieved.

A step ahead in such a blocking technological constellation, just as a step ahead in any other complex problem, can be brought about by a hack – an abstraction in application, excellence in programming – surprising, mediagenic, lucid in employment of technology, funny and non-violent.

Every System, as mistrusting as it might be, has one feature, a hidden method that can be applied to it, and it only: System.hack().

System.hack() opens up closed systems, and makes open ones permanently dynamic.

Every particular instance of working and living environment can be an interface susceptible to a System.hack(). This is the reason why the six System.hack()s selected for this exhibition are displayed in a reduced environment of everyday life, minimal common denominator of all our housing needs, a neutral environment (*sic!*): a hotel room.

Great innovations of avant-garde manage over and over again to overturn the dominant representation of (art) history and extract through their form and matter a subaltern course of history, unleash the future unto the history. The course of technological innovation similarly has been dominated by large systems of military, academia, media and market. System.hack()s are an attempt to extract a subaltern history of innovation, open the technology unto its futures, futures which shall stay unrepresented. Apt-art was an abstraction from the museum as a machine of history. This is an abstraction of an abstraction: a hotel room.

The War of the Worlds, the soundscape to the exhibition, creates an atmosphere where a moment of intense listening

and reading is enough to suspend the limits between reality and simulation, so that the world (as we know it) can be "annihilated before your ears". The world which, after this first trustworthy simulation, can no longer be trusted and which we can only fall back onto in the moments when our doubt in its credibility becomes suspended.

If we want to confirm the credibility of a radio broadcast, the easiest way would be to use the telephone to call into the show. However, the complex telephone relaying system is also a medium whose trustworthyness and credibility of functioning require an inordinate amount of trust. The telephone relaying system was designed to accommodate primarily the measurability of time, in order to make its every single use chargeable – a profit-driven idea which emerged over time and has by now (without any doubt) become accepted as the only *modus operandi*. However, the closed telephone relaying systems crack open as soon as the right frequency (2600 Hz) is whistled into the mouthpiece. And if the whistle with this frequency can be found in a box of crunchy corn flakes in the supermarket next door, this becomes an easy task.

To hide something from a curious hacker spirit who likes to share her discoveries with everyone interested enough is impossible. The technology of concealment is never creative enough in the protection of technological inventions (no matter how big the profit margin expected from these technological innovations). In order to protect the profit and obsolete business models, the state must enforce a restrictive legal regime of intellectual property and copyright. The restrictive enforcement can be however put to use to work in the other way around. The more this restrictive regime insists on restricting when coming into contact with what has been freed (within its own domain), the more freeing it unleashes.

Richard Stallman's GNU General public license (GNU GPL) served as a starting point when creating the concept of the System.hack() exhibition. The GNU General public license was an ingenious hack by R. Stallman that succeeded to symbolically constitute a community by means completely alien to it – legal means. Twenty years down the line and the idea of freedom in the world of ideas was not only preserved, but has served to erect a free information infrastruc-

ture offering in its every segment an alternative to the proprietary software solutions. Within the domain of social development there's no alternative to the idea of free exchange of information.

The synergy of the race for profit and hoarding of information takes place not only in the virtual network environment. The science is more and more discovering the reusable, manipulable and programmable code with which we can describe, but also create life. The genetic engineering of today is one of many areas of development where positions of power and dynamics of struggle known from the software domain are being replicated. Some call the hacker response here "biological civil disobedience", some cultural terrorism, and others the beginning of a cold war between the corporations producing genetically modified crops that hackers counter with genetically modified weed. The *Natural Reality Super-Weed Kit 1.0* is a "DIY kit capable of producing a genetically mutant superweed, designed to attack corporate monoculture". Heath Bunting calls biotechnology "not only the next battleground on which the control of life and land is fought, but also on which life itself is redefined. It is essential that the concepts of property and representation in this arena are seriously challenged."

As proprietary software production and industry grow, so does the development of free software. But the corporations are not going to sit and watch. While continuing to produce ever more restrictive legal instruments, corporations are also developing the technologies of control and protection of its products (technologies such as digital rights management, trusted computing, etc.) But the hacker spirit is restless too: given enough time, every machine is freed. Be it with an oscilloscope or reverse engineering (as is the case with Linux on Xbox), or sometimes with the things just lying around such as a marker or pressed shift key. Only to remind us how easy it is to be surprising, mediagenic, lucid in employing technology, funny and non-violent.

This catalog (in your hands) with descriptions of exhibits and essays inspired by the selected System.hack()s is a Table of Contents for the exhibiton. Look around, System.hack()s are all around...

Happy hacking!
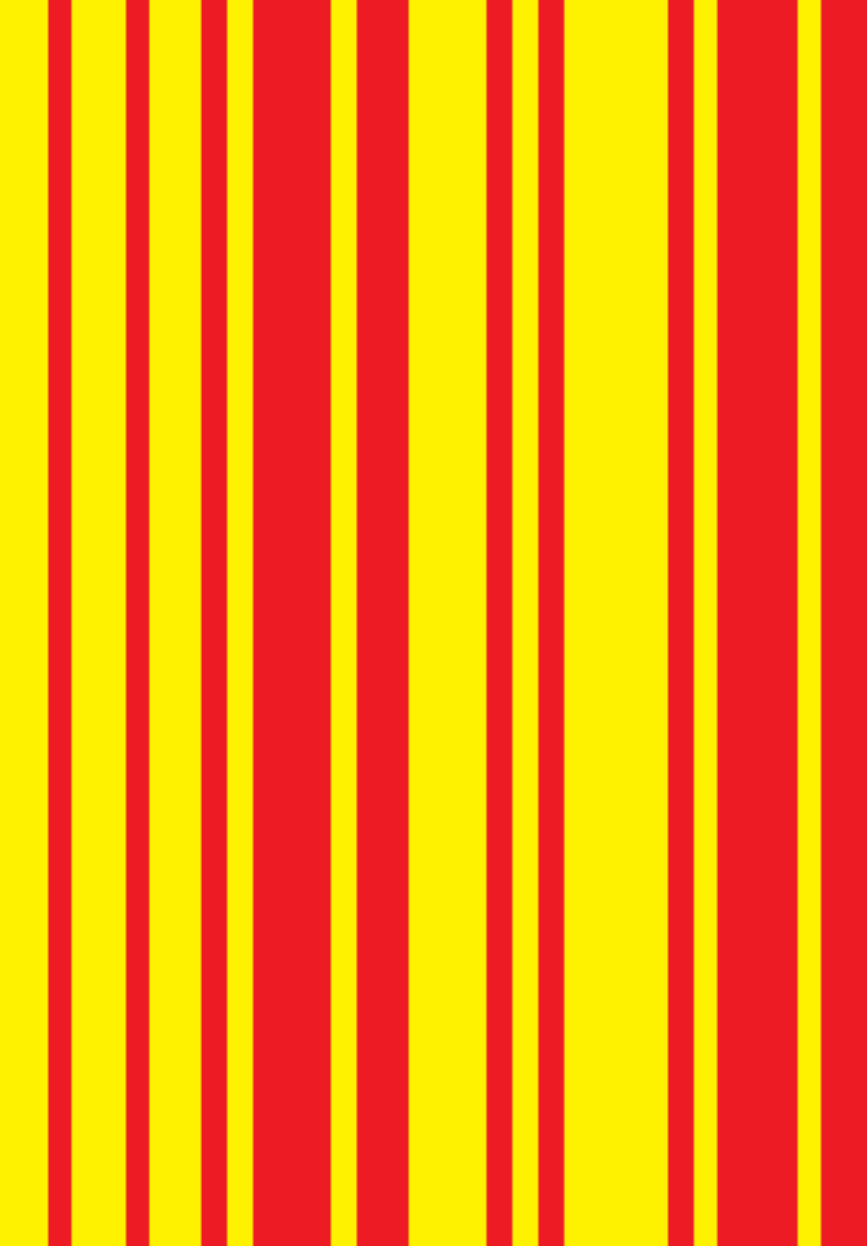
system.
hack()

System.hack(1,"elektronski mediji","Orson Welles – Rat svjetova")*

> Mogućnost masovne manipulacije publikom koju donose mediji možda je tek postala očita jednom od "naj(ne)slavnijih zabuna u povijesti". Dan prije Noći vještica, 30. listopada 1938., milijuni Amerikanaca uključili su se u popularni radio program *Mercury Theatre on the Air* koji je emitirao radio drame u režiji (a često i izvedbi) Orsona Wellesa. Te večeri izvedena je adaptacija znanstveno fantastičnog romana *Rat svjetova* H.G. Wellsa o invaziji Marsovaca na Zemlju. Međutim, u tu adaptaciju Welles je unio bitnu novinu: režirao je dramu kao da je riječ o revijalnom radijskom programu koji sve više postaje isprekidan izvještavanjem uživo o invaziji Marsovaca. Ovom tehnikom namjeravao je pojačati dramski učinak. Gotovo polovina pedesetominutne radio drame osuvremenjeno je prepričavanje događaja iz romana, transponiranih u dokumentarnu formu. Ovakav pristup radio drami nikada prije nije bio izveden (barem ne s toliko uvjerljivosti), a inovativna forma bila je ključni faktor u pomutnji koja je uslijedila.

Program, emitiran s 20-og kata zgrade na broju 485 Avenije Madison u New Yorku, započeo je kratkim uvodom u nakane vanzemaljaca i istaknuo da je adaptacija smještena u

1939., a zatim se nastavio kao uobičajeni zabavno-glazbeni program, povremeno prekidan kratkim vijestima. Prva vijest javila je o čudnim eksplozijama na Marsu. Iduće vijesti javljaju o meteoritu – kasnije se uspostavlja da je riječ o Marsovskoj raketnoj kapsuli – koji pada u New Jerseyu. Gomila se okuplja na mjestu događanja, a reporter Carl Philips prenosi događaje sve dok Marsovci toplinskim zrakama ne spale znatiželjne promatrače. Kasniji će izvještaji pokazati da su mnogi slušatelji čuli samo ovaj dio programa, nakon čega su kontaktirali susjede ili obitelj da ih upute u vijesti, a ovi su pak kontaktirali dalje druge, dovodeći tako do ubrzanog širenja glasina i pomutnje.

Marsovci masovno slijeću na Zemlju i nastavljaju razaranja kroz Sjedinjene Američke Države, uništavajući mostove i željezničke pruge, te ispuštajući otrovni plin u zrak. Jedan neimenovani ministar unutrašnjih poslova obraća se naciji. (Prvotno je bilo zamišljeno da lik Ministra bude portret tadašnjeg predsjednika Franklina Delanoa Roosevelta, ali je CBS inzistirao da se taj detalj izmijeni. U konačnici je ipak zvučao kao Roosevelt zahvaljujući Wellesovoj režiji glume Kennya Delmara). Vojne snage napadaju Marsovce, no nisu u mogućnosti suprotstaviti im se.

Nakon prijenosa događanja priča se prekida i nastavlja kao pripovijedanje preživjelog znanstvenika koji u svoj dnevnik bilježi posljedice kataklizme, ali i razriješenje priče (koje je bilo istovjetno s krajem romana) – Marsovci podliježu zemaljskim bakcilima i bakterijama. Nakon što se priča završi Welles izlazi iz uloge i podsjeća slušatelje da je ova radio drama samo izmišljotina uoči Noći vještica i ekvivalent oblačenju u plahte i glasanju poput duha – buuu. Na ovom dodatku inzistirali su izvršni urednici CBS-a svjesni panike koju će emisija izazvati.

Mnogi slušatelji nisu čuli ili su pak zaboravili najavu emisije, a u atmosferi rastuće tenzije i tjeskobe u danima nadolazećeg Drugog svjetskog rata, prihvatili su ovu radio dramu kao stvarno izvještavanje. Tadašnje novine izvještavale su o nastaloj panici, ljudima koji su se dali u bijeg i ljudima koji su u zraku osjetili miris otrovnog plina ili su pak vidjeli bljeskove borbe u daljini. Kasnije studije pokazuju da se panika bitno manje raširila od onoga na što su upućivali novinski izvještaji. Ipak, ostaje jasno da su mnogi srnuli – u ovoj ili onoj mjeri – u pomutnju koja je uslijedila.

Na kraju svega, CBS je izvjestio vlasti da su slušatelji bili upozoreni kroz emisiju da se radi samo o drami. Welles i Mercury Theatre prošli su bez kazne, no ne i bez cenzure, pa je tako CBS morao obećati da više nikada neće koristiti frazu *"we interrupt this program"* u dramske svrhe.

Studija *Radio Project* otkrila je da je većina ljudi zahvaćenih panikom čula da se radi o napadu Nijemaca (Germans) – a ne Marsovaca (Martians). Druge pak studije iznose tezu da su razmjere panike napuhali tadašnji mediji.

U novije vrijeme sugeriralo se da je emisija bila psihološki ratni eksperiment. Dokumentarac iz 1999. *Masters of the Universe: The Secret Birth of the Federal Reserve*, pisca Daniela Hopsickera tvrdi kako je Rockefeller Foundation u svrhu proučavanja širenja panike u stvari financirala emisiju, te izradila izvještaj koji je ostao dostupan samo odabranima.

U biografiji **Orsona Wellesa** kriju se komični performansi iz televizijskog programa naslovljenog *Orson's Bag*. Pretvorio bi se u lik Winstona Churchilla, uvježbavao likove iz *Moby Dicka*. Vodio je svoj kratki šou uživo u kojem je ugostio Muppete, Burta Reynoldsa, Angie Dickinson. Wellesovi nerealizirani, nedovršeni, neprikazani, otkazani filmski projekti protežu se čitavom njegovom filmskom karijerom. *Građanin Kane (Citizen Kane)* priča je za sebe – značajem se smješta u kontekst kinematografije, ali i onaj kulturne povijesti. Veličina Wellesa i onoga što se uz njega vezuje, ma što se o tome mislilo, ipak se čini nerazdvojivom od prizvuka grandioznosti, epskih odlika u svemu. Ova krupna figura s glasom diva iz crtanih filmova sposobnog za iznimno suptilnu interpretaciju odigrala je nevjerojatne filmske role. Duh, sklon sanjarenju i utopijskim planovima, osmislio je radio dramu *Rat svjetova* koja je i danas predmet mnogih istraživanja i teorijskih analiza – prvi i možda najveći masmedijski *hoax*.

Uspon i pad medijske realnosti u dobu radija

> Sada znamo da je ranih godina dvadesetog stoljeća u svoj pohod svijetom krenuo masovni medij drugačiji od svih prethodnih. Radio. Medij kojim započinje doba elektronskih medija, medij glasa, međutim, ostat će drugačiji ne samo od prethodnog medija pisma, već i budućeg medija slike. Medijsko doba glasa drugačije ne samo od medijskog doba pisma, već i od medijskog doba slike.

U tim prvim dekadama dvadesetog stoljeća svoje formiranje započinje također socijalno-politička organizacija modernih društava, temeljena na jedinstvenoj političkoj javnosti integriranoj medijima sinkrone masovne recepcije i usponu srednje klase kao prethodnici potrošačkog društva druge polovice stoljeća. A u tom konstituiranju javnosti kroz medijsku realnost i potrošačko društvo radio će odigrati prijelomnu ulogu.

Moderno shvaćena politička javnost konstituira se doduše već u pisanoj kulturi rane građanske klase. Novine stvaraju javnost koja živi u jedinstvenoj svijesti o udaljenim događanjima kao događanjima u zajedničkom vremenu i prostoru – zapravo, tek s tim prvim masovnim medijem i nastaje zajedničko vrijeme i prostor moderne političke zajednice. Poznato je, primjerice, da je Francuskoj revoluciji prethodila eksplozija novina i časopisa najrazličitijih vrsta. Međutim, potencijalna potpuna integracija javnosti iz razloga relativne vremenske asinkronosti recepcije novinskog izvještavanja i socijalne limitacije pismenosti neće se dogoditi prije radiodifuzije.

Radiodifuzija će stoga inaugurirati novu političku ontologiju temeljenu na čitavom nizu posebnosti tog novog medija:

Prvo, prijenos u realnom vremenu – istodobnost slanja i kolektivnog primanja poruke. Ta mogućnost brze recepcije učinit će brzo izvještavanje o recentnim događanjima – vijesti – politički formativnim oblikom radijskog doba.

Drugo, uživost događanja u njegovoj medijskoj transpoziciji. U uvjetima prijenosa u realnom vremenu, uživost će slušateljima omogućiti istinsku uključenost u događanja unatoč fizičkoj odsutnosti. Događaji njihovog vremena događat će se istodobno njima kao i neposrednim akterima, a recepcija će postati poseban oblik sudjelovanja, afektivne mobilizacije.

Treće, sinkronost u samom činu recepcije među međusobno udaljenim slušateljima kakva prethodno nije mogla postojati među međusobno udaljenim čitateljima. Radio je ipak bio medij efemernog prenošenja poruke, a ne njenog pohranjivanja kao što su to bile novine.

Četvrto, telestezijsko skraćivanje i objedinjavanje prostora u jedinstveni prostor događanja. Sinkronost recepcije i telestezijsko objedinjavanje prostora stvorit će jedinstveni prostor i vrijeme događanja velike političke zajednice – nacije.

Peto, dominacija glasa kao autentičnog iskaza i jamstva prisustva govornika bez njegove nazočnosti. Iz tog potencijala glasa doba radija stvorit će tako posve novi žanr političkog govora – obraćanje naciji, gdje će obraćanje političkog autoriteta služiti neodloživoj afektivnoj mobilizaciji velike političke zajednice kao jedinstvenog subjekta.

Šesto, prodor javnog govora u privatni prostor slušatelja, obiteljski prostor okupljanja oko radijskog prijemnika, stvorit će novu vrstu prožimanja između javne sfere i privatne sfere inicirajući posve novu formaciju legitimacije javnog kroz privatno. Promjena socijalne forme recepcije* promijenila je i demografsku strukturu legitimacije, uključivši u zajednički prostor i vrijeme jedinstvenog političkog događanja one dijelove populacije koji su prethodno bili izostavljeni – nepismene, nepunoljetne, žene, starce itd. – sve one koji su sjedili za obiteljskim radijskim prijemnikom – i stvorivši time široki pojam javnog mnijenja kako ga danas običavamo koristiti kada govorimo o ispitivanjima mišljenja građana, o čijim rezultatima današnje obnašanje vlasti toliko ovisi.

Sve većem legitimacijskom značaju javnog mnijenja, koje uključuje i one koji nisu prethodno bili politički pitani za mišljenje, pogodovat će, sedmo, promjena socijalne strukture recepcije. Radijsko doba obilježit će početno formiranje srednje klase kao buduće noseće klase potrošačkih društava blagostanja. Uostalom, i sam radio je započeo kao potrošački proizvod – prvi radijski programi većinom nisu bili komercijalni, već su služili kao sadržaj kojim su velike robne kuće privlačile kupce da kupe radijske naprave ili kao programi kojima su velike novinske kuće privlačile čitatelje.

Gotovo tri desetljeća nakon početka emitiranja prvog radijskog programa 1909., u "predvečerje" Drugog svjetskog rata i u predvečerje noći vještica 30. listopada 1938. *CBS* i *Mercury Theater on the Air* emitirao je *Rat svjetova* H. G. Wellsa u radijskoj adaptaciji Orsona Wellesa. Kao što je dobro poznato, Wellesovo

* Premda je socijalna forma recepcije često zanemarivani aspekt u medijskoj teoriji, već od Benjamina previranje u socijalnoj formi do kojeg dolazi u tranziciji između dvaju medija zapravo predstavlja auratski moment javljanja političke mase – masovnu mediauru kako to naziva Sam Weber. Koliko je za estetiku bitno iskustvo šoka koje kinematografija donosi s montažom, toliko je bitno kolektivno iskustvo gledanja filma u kinematografu.

fingirano izvještavanje uživo o invaziji Marsovaca na planet Zemlju natjeralo je mase uznemirenih slušatelja, koji su, uključivši se naknadno u emisiju, fikciju zamijenili za zbilju, da se panično daju u bijeg pred nadorom Marsovaca.

Welles je u toj najslavnijoj medijskoj varci iskoristio dotad uglavnom neprimijećeno pomicanje granice odnosa medija i referentne realnosti koje se dogodilo u radijskom dobu. Povezao je mogućnost simuliranja faktičnosti fiktivnih događanja pomoću vještih konstrukcija tehnike prijenosa uživo, prekidanja prijenosa vijestima, javljanjima, obraćanjima javnosti, i moć afektivnog mobiliziranja koje je nudio sugestivni medij zvuka i glasa. Povezao je realnu prijetnju predstojećeg rata i strah pred stranim predstavljen vanzemaljskom invazijom. Sekretar unutarnjih poslova u radiodrami namjerno je zvučao kao tadašnji predsjednik SAD-a Franklin Delano Roosevelt, a mnogi su se slušatelji uspaničili čuvši namjesto *"Martians"* *"Germans"*.

Rat svjetova razotkrio je da je suvremena politička događajnost kroz elektroničke medije postala fluidna kategorija: afektivno obojeni svijet politike straha. Prijenos u realnom vremenu postao je velika politička zajednica u realnom vremenu, prostor globalne mobilizacije nacija.

Međutim, spoznaja o medijskoj posredovanosti političke realnosti koja je tim *hoaxom* ušla u opću svijest nosi u sebi paradoks koji dobitak od te spoznaje čini neizvjesnim. Naime, iako znamo da realnost zbog te medijske posredovanosti jest podložna hakiranju, mi uvijek iznova ne raspoznajemo simulaciju. Jer, što je mediji vjerodostojniji realnosti, to realnost postaje nevjerodostojnija. Taj uvid o vjerodostojnoj simulaciji nevjerodostojne realnosti, sažet u odjavnim riječima Orsona Wellesa *"we have annihilated the world before you ears* – uništili smo svijet pred Vašim ušima", nakon svog rođenja u doba radija napošljetku u doba televizijske slike postaje totalan.

> Tomislav Medak <

System.hack(2, "telekom", "Captain Crunch – zviždaljka")*

> Lik i djelo Johna T. Drapera obavijeno je zadahom ludila, situacijama koje nalikuju romanesknim zapletima i kafkijanskom tonalitetu. Poznat je pod nadimkom Captain Crunch kojeg je dobio po zviždaljci iz kukuruznih pahuljica. Joe Engressia, slijepi dječak, otkrio je Johnu Draperu što je moguće napraviti sa zviždaljkom koja je u to vrijeme bila poklon u kutiji *Cap'n Crunch* pahuljica. Zviždaljku se moglo lako modificirati da emitira zvuk na 2600 Hz – frekvenciju koju su koristile AT&T-ove telefonske centrale za međumjesne pozive kako bi upozorile da je linija slobodna za novi poziv. To bi izazvalo prekid na jednom kraju linije, dopuštajući drugom, još uvijek spojenom kraju da prijeđe u operatorski modus. Eksperimentiranje s tom zviždaljkom inspiriralo je Drapera da izgradi *blue box* – elektronički uređaj sposoban za reproduciranje drugih tonova koje koriste telefonske kompanije kako bi pomoću njih mogao uspostavljati pozive. Draper je završavao tri puta u zatvoru zbog telefonskih prijevara i sličnih optužbi. Uhićen je zbog optužbe za telefonsku prijevaru 1972. i osuđen na pet godina uvjetno. Sredinom '70-ih svoje vještine hakiranja telefona – frikinga (engl. *phreaking*) – prenio je i na Stevea Jobsa i Stevea Wozniaka, koji su kasnije pokrenuli

kompaniju Apple Computer. Steve Wozniak se oduvijek divio Draperu. Upoznat s nacrtima za *blue box*, Wozniak ih je bitno poboljšao i počeo prodavati po sveučilišnom kampusu koristeći zarađeni novac za rad na onome što će kasnije postati Apple Computer. Draper je kratko vrijeme bio zaposlen u Appleu i osmislio je sklop telefonskog sučelja za *Apple II*. Sklop nije nikada izašao na tržište, i to dijelom zahvaljujući Draperovu uhićenju i osudi zbog telekomunikacijske prijevare 1977. Četveromjesečnu kaznu odslužio je u zatvoru u Kaliforniji, gdje je napisao *EasyWriter* – prvi tekst procesor za *Apple II*.

Tijekom boravka u slabo čuvanom zatvoru držao je predavanja o telefonskim hakovima i podučavao je sve zainteresirane na koje sve moguće načine manipulirati komunikacijskim tehnologijama. Jasno mu je ukazana činjenica što bi se dogodilo ako odbije podučavati u zatvoru te da svakako izbjegne opasnost da postane 'dojavljivač', pa je tako, kako bi preživio kroz kazneni sustav, bio prisiljen držati predavanja o stanovitim tehnologijama.

Slabosti sustava koje su Draper i ostali otkrili bile su ograničene na preusmjeravanje poziva na sklopkama koje se koristile unutarkanalnu signalizaciju (razmjena operatorskih signala unutar istog kanala na kojem se odvija i poziv), dok se novija oprema u potpunosti temelji na vankanalnoj signalizaciji, upotrebi odvojenih kanala za prijenos glasa i sprijenos ignala. Captain Crunch zviždaljka proizvodila je ton na 2600 Hz koji na sustavu s unutarkanalnom signalizacijom otvara međumjesnu liniju za novi poziv. Tada u akciju kreće *blue box* sa svojim dvofrekvencijskim kombinacijama, poznatim kao multifrekvencije ili MF, koje su slične tonskom biranju. Neki telefonski sustavi rade i na jednoj frekvenciji.

Captain Crunch zviždaljka sa svojih 2600 Hz mogla je uputiti čitav poziv. Jedan dugi zvižduk za uspostavljane linije, kratak za "1", dva kratka za "2", itd. Slijepi friker savršenog sluha Joe Engressia mogao je birati cijeli poziv zviždeći samo svojim ustima.

Nakon otkrića novih granica koje su otvorile *blue boxes*, Draper je mogao istraživati čitav novi spektar brojeva. Ti su brojevi bili kodovi za biranje međumjesnih linija koje su koristili operateri iz jednog grada kako bi uspostavili kontakt s operatorom iz drugog. Danas ti tzv. kodovi za preusmjera-

vanje nisu u upotrebi, no u vrijeme kada je Draper eksperimentirao mogao je otkriti sve vrste brojevnih intervala.

Draper bi podigao slušalicu u javnoj govornici i zatim bi 'isfrikirao' poziv na drugi kraj svijeta. Bez plaćanja, preusmjeravao bi poziv preko različitih telefonskih 'poslužitelja' u različitim zemljama kao što su Japan, Rusija i Engleska. Jednom je posložio poziv tako da ide preko deset zemalja. Zatim je ukucao broj javnog telefona pored sebe. Nekoliko minuta kasnije telefon pored njega je zazvonio. Draper bi nešto kazao u prvi telefon i nakon dosta sekundi začuo bi svoj glas jedva čujno na drugom telefonu. Ovo je samo jedan od primjera iz njegove karijere suludih istraživanja.

Ubrzo nakon toga stvorio je jednostavniji *blue box* te počeo istraživati na kojem principu rade interni kodovi telefonskih kompanija za međumjesne linije. Otkrio je da su interni kodovi za biranje bili drugačiji od normalnih brojeva kojim bi se služio telefonski pretplatnik.

Priča o njegovom eksperimentu se proširila, stigla do novinskih stranica, a zatim i do organa vlasti, razotkrivanja mreže sudionika i konačno do Draperovog zakonskog procesuiranja. Eksperiment je izazvao golemu materijalnu štetu koja je uključivala troškove nenaplativih telefonskih poziva, redizajniranje linijskih protokola i ubrzanu zamjenu opreme. A *Cap'n Crunch* zviždaljke, nakon što su izašle iz upotrebe, postale su vrijedan kolekcionarski predmet.

Žitne pahuljice i unutar-kanalno signaliziranje

> Proteklih pedeset godina proizvođači žitnih pahuljica na dno pakovanja hrskavih, zašećerenih kukuruznih i zobenih pahuljica skrivaju male poklone, takozvane "nagrade". To "iznenađenje", kako ga djeca često nazivaju, najčešće je plastična igračka ukrašena imenom ili logom proizvođača žitarica. Ti su nagradni predmeti uvijek jeftini i lomljivi. Naići u zdjelici na igračku i otkriti o čemu se ovog puta radi za dijete je gotovo redovito uzbudljivije no igrati se s njom.

Možda najslavnija nagrada u povijesti pahuljica – ali svakako najslavnija nagrada među hakerskom zajednicom – bila je inače ni po čemu posebna zviždaljka koja se mogla naći na dnu pakovanja *Cap'n Crunch* žitarica u 1960-tima. Za većinu onih koji nisu hakeri ta zviždaljka bila je samo najobičnija plastična zviždaljka – velika većina tih zviždaljki odbačena je i zanemarena čim bi ih se djeca zasitila. Kao kod svih zviždaljki, puhneš u nju i ona proizvede visokofrekvencijski šum. Kao kod mnogih drugih zviždaljki, ako začepiš jednu od izlaznih rupica, ton zviždaljke postane viši. Ton sa začepljenom rupicom bio je E iznad srednjeg C – znanstvenim rječnikom kazano, zvuk koji proizvodi zrak kada titra sinusodiom frekvencije 2600 Hz. Da bi se shvatilo zašto je zviždaljka koja proizvodi taj ton tako bitna hakerima potrebno je ući u malo više tehničkog objašnjavanja i malo više u povijest.

Sredinom dvadesetog stoljeća telefonski sustav Sjedinjenih Američkih Država bazirao se na "unutarkanalnom signaliziranju". To znači da se same informacije o telefonskoj vezi u osnovi prenose kao audio podaci preko telefonske linije. Drugim riječima, telefonska oprema AT&T-a koristi čovjeku čujne signale (tj. šumove ili tonove) kako bi signalizirala sve podatke potrebne pri usmjeravanju poziva i veza koje sustav koristi za komuniciranje statusa pojedinog poziva ili linije te adekvatno koordiniranje radnji. I danas kada birate telefonski brojevi proizvode različite čujne piskove – možete zasvirati melodiju pritišćući brojeve na telefonu. Ali pored pukog biranja brojeva, AT&T je trebao iznaći način kako prepoznati da linija funkcionira. Odsustvo bilo kakvog signala činilo bi se idealnim načinom kako predstaviti slobodnu liniju, ali to bi moglo naprosto značiti da je došlo do stanke u prijenosu glasa ili da je razgovor stavljen na čekanje. Namjesto toga, AT&T se odlučio puštati postojani ton E iznad srednjeg C – 2600 Hz – na svim funkcionirajućim raspoloživim linijama kako bi ostatku sistema signalizirao da je linija slobodna. Možete si ga predstaviti kao pozivni ton koji postoji samo kada je svaki telefon poklopljen. Riječ je o nečemu što čovjek nikada ne bi trebao čuti, a svakako o nečemu što čovjek nikada ne bi trebao proizvesti.

Ispočetka upotreba 2600 Hz bila je ekskluzivno znanje u vlasništvu inženjera AT&T-a. Međutim, s vremenom, objavljenim radovima i brojnim sretnim pogreškama, mnogi su ljudi došli do saznanja o tonu na 2600 Hz. Hakeri – odnosno točnije 'djeda' današnjih hakera, poznati kao *phreakeri* (kombinacija pojmova *phone freak* i *hacker*) – otkrili su 2600 Hz. Iako nije jasno tko je točno u frikerskoj zajednici 'otkrio' mogućnosti upotrebe 2600 Hz za ispitivanje sustava, hakerska predaja zaslugu pripisuje Joeu Engressiji.

Engressia je rođen slijep, obdaren savršenim sluhom, a većinu svoje adolescencije i mlađe dobi proveo je na telefonu. Ponekad bi zviždao kada je preslušavao ili ostavljao telefonske poruke. Legenda kaže da je s osam godina Engressia otkrio da bi, kada zazviždi na 2600 Hz, bio 'isključen' s telefonskih linija (premda bi one zapravo samo utihle). S vremenom, istražujući telefonski sustav, on je otkrio točno i zašto.

Ako bi nazivatelj preko Bell/AT&T-eve telefonske mreže uputio poziv na besplatni, međumjesni 1-800 broj – ili na bilo koji broj udaljen više od pedeset milja – telefonski poziv bio bi preusmjeren preko međumjesne linije ili tzv. "*trunka*". Puštanje tona na 2600 Hz uvjerilo bi međumjesnu liniju da je nazivatelj poklopio slušalicu i da treba pričekati da netko drugi uputi poziv. Međumjesna linija bi se na brzinu odvojila i ponovno spojila procedurom poznatom kao "nadzorno poništenje". Proizvela bi kratak klik nakon kojeg bi uslijedila tišina. Taj klik i tišina bili su zvuk kojim jedan kraj međumjesne linije signalizira drugom kraju – vjerojatno drugom dijelu telefonskog sustava – da čeka na brojeve za usmjeravanje poziva. Odašiljući odmah drugi ton poznat kao "ključni pulsni ton" i nakon toga niz brojki (bilo telefonski broj ili interni kod telefonske kompanije) nazivatelj koji je poslao ton na 2600 Hz mogao bi onda uputiti međumjesni poziv ili interni poziv unutar telefonske kompanije *sa* međumjesne linije. Zvao je besplatno.

Do sredine šezdesetih Engressia je otkrio sve to i još mnogo toga. Engressia je tako sretno proveo godine zviždućući na svom putu do besplatnih telefonskih poziva i dubljeg razumijevanja svih dijelova američkog i ranog globalnog telefonskog sustava – do razine koja je nadmašivala i većinu Bellovih inženjera. A Engressia nikako nije bio jedini. Naravno, mnogi hakeri bez savršenog sluha morali su pribjeći tehničkim sredstvima da bi proizveli ton na 2600 Hz. Imajući upravo to na umu,

Engressia je nazvao svog prijatelja Johna Drapera da mu kaže o zanimljivoj karakteristici zviždaljke koju je našao u pakovanju Cap'n Crunch pahuljica.

A Draper ne samo da je upotrijebio zviždaljku da bi zvao besplatno, nego ju je upotrijebio za svoj hakerski nadimak, tako da je i dan danas u hakerskoj i frikerskoj zajednici poznatiji kao Captain Crunch. S vremenom Draper je učinio friking jednostavnijim, a tehnologiju pristupačnijom ugradivši ton na 2600 Hz i druge tonove korisne za one koji su bili zainteresirani za istraživanje telefonskih mreža ili za besplatne međumjesne pozive u specijalizirane uređaje poznate kao *"blue boxes – plave kutije"* – nazvane tako jer je prva takva kutija koju je Bellov sustav osiguranja konfiscirao nađena u plavoj plastičnoj kutiji, a ne zato što su one redom ili većinom bile plave.

Captain Crunch je 1972. uhapšen na osnovu optužbi za telefonsku prevaru i osuđen na petogodišnju uvjetnu kaznu. U nekom trenutku sredinom 1970-tih podučavao je i utemeljitelje kompanije Apple Computer, Stevea Jobsa i Stevea Wozniaka, kako da izrade i prodaju vlastite plave kutije. U sukob sa zakonom došao je ponovno 1977. zbog optužbe za telekomunikacijsku prevaru i odslužio je četiri mjeseca u zatvoru. Nakon puštanja na slobodu nastavio je živjeti kao softverski programer, napisavši prvi tekst proce-

sor za *Apple II*. Početkom osamdesetih tehnologija na kojoj se zasnivala telefonija ušla je u skupo i opsežno preustrojavanje, dijelom kako bi blokirala tehnike koje je stvorio i proširio Captain Crunch. Međutim, bitnije za Drapera, tehnologija osobnih računala počela je otvarati vrata jednom sasvim novom svijetu – svijetu računala, softvera i mreža – svijetu u kojem će frikeri brzo postati hakeri.

Danas je telefonska komutacija u svim zemljama Zapada i u većini ostalog svijeta postala digitalna i koristi vankanalno signaliziranje. *Captain Crunch* zviždaljka i plave kutije ne 'rade' već desetljećima. Zanimljivim razvojem događaja posljednjih godina, *Voice over IP* (VoIP) tehnologije, zajedno sa sve većom rasprostranjenošću brzih internetskih linija, omogućile su hakerima da se vrate korijenima trudeći se ostvariti i ostvarujući izvorni frikerski cilj besplatnog telefoniranja.

Njujorški časopis *2600* sebe naziva "Hakerskim tromjesečnikom". On ostaje jedna od najdugovječnijih institucija hakera koji su spremni izazivati sigurnosne sustave i istraživati. Lokalni 2600 sastanci diljem svijeta nude važno mjesto za hakere, mlade i stare, da dijele stručno znanje, da uče i da se druže. Ime je, naravno, danas često zaboravljena referenca na slavnu frekvenciju i jedan od najslavnijih hakova svih vremena.

> **Benjamin Mako Hill** <

System.hack(3, "zakon o autorskom pravu", "Richard Stallman – GNU Opća javna licenca")

> Začetnik pokreta za slobodni softver Richard Stallman dugi niz godina radio je u laboratoriju za umjetnu inteligenciju na Massachussetts Institute of Technology (MIT). Prateći okolnosti razvoja računalnih programa te uvidjevši nedostatke i etičke dileme nastale s uvođenjem vlasničkog softvera, pokušao je stvoriti alternativni sustav koji bi ih izbjegao – slobodni softver. U siječnju 1984. napustio je posao na MIT-u i započeo raditi na slobodnom operativnom sustavu. Rad na GNU Emacsu započeo je u rujnu 1984., a već početkom 1985. početni sustav je poprimio upotrebljiv oblik. Do 1990. GNU sustav bio je gotovo dovršen – jedina važna komponenta koja je nedostajala bila je jezgra. Prvotna jezgra budućeg operativnog sustava trebao je postati GNU HURD – jezgra koja se bazirala na mirko-jezgri Mach. Kako je GNU HURD kasnio s razvojem, razvoj GNU operativnog sustava usporio je sve dok se nije pojavila druga raspoloživa jezgra. Godine 1991. Linus Torvalds razvio je Unixu kompatibilnu jezgru i nazvao je Linux, a kombiniranje Linuxa s GNU sustavom rezultiralo je cjelovitim slobodnim operativnim sustavom. Zahvaljujući Linuxu danas možemo koristiti GNU operativni sustav, koji se u toj kombinaciji naziva GNU/Linux.

GNU slobodni softver sačinjavaju programi koji su objavljeni pod uvjetima koji svakom omogućuju da ih prouča-

va, mijenja i dalje dijeli bližnjima. Prednost GNU softvera je dakle njegova etička komponenta koja omogućuje korisnicima suradnju i poštuje njihove slobode. Da bi to postigao u okruženju gdje je softver zaštićen autorskim pravom, *copyrightom*, i u vremenima kada se to pravo počelo primjenjivati ne bi li se softver pretvorio u privatno vlasništvo i proizvod za računalno tržište, bilo je potrebno naći načina da se iskoristi pravni okvir koji je postavljao *copyright* kako bi se spriječilo pretvaranje GNU softvera u privatno vlasništvo. Metoda kojoj je Richard Stallman pribjegao nazvana je "*copyleft*". Bit *copyrighta*, autorskog prava, poput drugih sustava vlasničkog prava, krije se u moći da isključuje. Vlasniku *copyrighta* pravno je dana moć da brani drugima kopiranje, distribuiranje i modificiranje djela. *Copyleft* se temelji na *copyrightu*, ali izokreće njegov smisao: umjesto da znači privatizaciju softvera, on znači očuvanje njegove slobode. Glavni smisao *copylefta* je prepuštanje prava svakom korisniku da slobodno koristi program, kopira ga, izmjenjuje i distribuira izmijenjene verzije, pod uvjetom da daljnjim korisnicima ne nameće ograničenja bilo kakve vrste, već da ga dalje dijeli, u izvornom ili izmijenjenom obliku, pod istim uvjetima pod kojima ga je primio. Kod GNU softvera *copyleft*, to izokretanje *copyrighta* iz alata privatizacije u alat dijeljenja, implementiran je kroz GNU Opću javnu licencu – *GNU General Public License*, skraćeno GNU GPL.

Kao što kaže definicija slobodnog softvera (http://www.gnu.org/philosophy/free-sw.hr.html): "'Slobodni softver' je stvar slobode, a ne cijene. Za razumijevanje tog pojma, trebate shvatiti 'slobodni' u smislu 'sloboda govora', a ne u smislu 'slobodan (besplatan) upad'.

Slobodni softver ukazuje na slobodu korisnika da pokreće, kopira, distribuira, proučava, mijenja i poboljšava softver. Još određenije, ukazuje na četiri vrste sloboda za korisnike softvera:

— Sloboda pokretanja programa, u bilo koje svrhe (sloboda 0).
— Sloboda proučavanja rada programa i njegovog prilagođavanja vašim potrebama (sloboda 1). Pristup izvornom kodu je preduvjet za to.
— Sloboda distribuiranja kopija, kako biste mogli pomoći bližnjemu (sloboda 2).

— Sloboda poboljšavanja programa i ustupanje vaših poboljšanja javnosti, za blagodat cijele zajednice (sloboda 3). Pristup izvornom kodu je preduvjet za to."

U GNU projektu koristi se *copyleft* kako bi se te slobode zaštitile. Ali postoje i softveri koji su također slobodni, no nemaju *copyleft* klauzulu. Međutim, upravo je to svojstvo omogućilo slobodnom softveru da upregne kreativni napor tisuća razvijatelja diljem svijeta u zajednički rad na razvoju slobodnog softvera bez straha da će taj njihov zajednički trud netko moći prisvojiti ili da će netko napraviti napredak na temelju njega, a da taj napredak neće vratiti natrag u daljnji razvoj slobodnog softvera.

Richard Matthew Stallman utemeljitelj je pokreta za slobodni softver, GNU projekta i Fondacije za slobodni softver. U njegova najveća dostignuća spadaju Emacs (i kasniji GNU Emacs), GNU kompajler, GNU debugger (program za pronalaženje pogrešaka). Autor je GNU Opće javne licence (GNU General Public License – GNU GPL), najšire prihvaćene slobodno-softverske licence, koja je probila put konceptu *copylefta*. Od sredine 1990ih većinu aktivnosti usmjerio je na političke kampanje, promicanje slobodnog softvera, kampanje protiv softverskih patenata i protiv proširivanja pravnog režima *copyrighta*.

Richard Stallman — Hakiranje vlasništva

> Richard Stallman je arhetipski haker koji je kroz vlastitu praksu na području računarstva otkrio poveznicu između informacije i vlasništva s kojom se danas suočavaju svi hakeri – hakeri u najširem smislu . Izazov Stallmanovog djela jest kako povezati sve te različite hakerske prakse. Za Stallmana hakiranje znači ispitivanje granica mogućeg. Nakon uzorne karijere u hakiranju softvera Stallman se okrenuo hakiranju informacijske politike.

Njegov pokret za slobodni softver osporava shvaćanje da je autorsko pravo prirodno pravo. On koristi zakon o autorskom pravu protiv njega samoga, kao instrument za stvaranje provedive slobode, a ne zakone intelektualnog vlasništva kao provedivu neslobodu. Stallmanova Opća javna licenca inzistira ne samo na tome da se ono što se objavljuje pod tom licencom može dijeliti, već i da sve prerađene verzije materijala koji je objavljen pod tom licencom moraju također biti slobodne.

Premda opetovano izjavljuje da on nije protiv biznisa, Stallman predlaže posve drugačije poimanje informacijske ekonomije. Za Stallmana je umjetna oskudnost stvorena prisvajanjem informacije neetič-

na. Naime, ako mu se nešto sviđa, onda on to želi podijeliti. Slobodni softver se temelji na društvenoj prednosti suradnje i etičkoj prednosti poštivanja korisnikove slobode. On predstavlja iskorak prema svijetu nakon oskudnosti. Stallman vidi slobodni softver kao praktički idealizam koji širi slobodu i suradnju.

Stallman razlikuje otvoreni kôd od slobodnog softvera. Otvoreni kôd je metodologija razvoja, slobodni softver je društveni pokret – društveni hak. Stallman nadopunjuje svoja praktička nastojanja za širenje slobodnog softvera pod Općom javnom licencom kritikom onoga u što se pretvorio sustav autorskog prava. Stallman inzistira na tome da je u Sjedinjenim Američkim Državama autorsko pravo počelo ne kao prirodno pravo, nego kao umjetni monopol – prvotno na ograničeno razdoblje. Autorsko pravo donosi koristi izdavačima i autorima ne radi njih samih, već radi općeg dobra. Ono je trebalo biti poticajem da se više piše i objavljuje.

Međutim, pisci moraju prepustiti prava izdavačima da bi ih se objavljivalo. Pisci uobičajeno ne posjeduju sredstva za proizvodnju i distribuciju da bi realizirali vrijednost

svojih djela, stoga gube kontrolu nad proizvodom svoga rada. Kako izdavači nakupljaju bogatstvo u obliku iskoristivih autorskih prava, legitimacija autorskog prava premješta se s općeg interesa zajednice čitatelja na "ravnotežu" interesa između pisaca i čitatelja. Odnosno, između izdavača i čitatelja. Dok je autorsko pravo dopuštalo privremene monopole u interesu općeg dobra, novonastajući režim prava "intelektualnog vlasništva" štiti interes izdavača kao interes po sebi i za sebe. Možda zapravo kao novi klasni interes – onoga što sam drugdje nazvao 'vetkoralističke klase', klase koja koristi pravni režim intelektualnog vlasništva kao sredstvo konroliranja proizvodnog procesa kroz vlasništvo nad informacijom kao privatnim vlasništvom.

Konsolidiranje intelektualnog vlasništva kao nečeg bliskog apsolutnom pravu privatnog vlasništva naznaka je da se formira novi klasni interes. Intelektualno vlasništvo nije kontinuitet, već raskid sa starim pravnim formama. Ono što je trebalo opravdati pod autorskim pravom bio je artificijelni monopol, ono što treba opravdati pod intelektualnim vlasništvom jest opći interes. Što se to, zapravo, dovodi u "ravnotežu"? Čitateljeva sloboda da čini što god želi s informacijom ili čitateljev interes da se proizvodi više informacije? Pod režimom intelektualnog vlasništva samo je ovo drugo "pravo", a ne prvo. Jedino čitateljevo pravo je da kupi intelektualno vlasništvo.

Čak i ako prihvatimo dvojbenu pretpostavku da intelektualno vlasništvo maksimira proizvodnju, ono što ono maksimira jest proizvodnja neslobode. Izgubivši pravo da plagiraju, kooptiraju i prerađuju djela kako žele, čitatelji su suočeni s tim da je njihovo jedino pravo u tome da kupuju djela od izdavača. Izdavači – vektoralna klasa – tvrde da je sve što im smanjuje prodaju "piratstvo". Kao što je sama pankerska princeza, Courtney Love, jednom rekla, glazbena industrija je pirat – ni autori nisu u ništa boljoj situaciji no čitatelji (ili slušatelji ili gledatelji). Suočavaju se s vektoralističkom klasom koja sada tvrdi da su njena prava najviši prioritet. Opće dobro valja mjeriti isključivo i jedino maržama vektoralističkih industrija.

Budući da je dosada uspijevala osigurati svoja prava, vektoralistička klasa sada zagovara potpuno zatvaranje svakog aspekta informacije u ograde vlasništva. Ona želi šifrirati informaciju, vezujući je artificijelno uz pojedinačne materijalne predmete. Želi kriminalne sankcije za svakoga tko prekrši to pravo sada apsolutno privatnog vlasništva. Patenti, kao što Stallman ističe, funkcioniraju posve drugačije od autorskih prava, no naposljetku ishod je jednak – osiguravanje informacije kao vlasništva koje ima ekvivalenta vrijednost na apstraktnom terenu komodifikacije.

Za razliku od autorskih prava, patenti ne važe automatski, već se moraju registrirati, kreirajući time dugotrajnu lutriju za hakere koji

ponekad nikako ne mogu znati tko drži patent. To je manji teret za vektoralističku klasu. Vektoralni biznisi akumuliraju portfelje patenata koje licenciraju međusobno jedni drugima, poboljšavajući si međusobno gotovo monopolističku poziciju. Ishod zatvaranja informacije unutar okvira vlasništva nije oskudnost inovacije, već oskudnost suradnje.

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Kao što Stallman ironično ističe, tijekom hladnog rata i SSSR i SAD su kontrolirali informacije, ali pod različitim režimima. SSSR je kontrolirao informacije radi političkih razloga, što je prouzročilo ekonomsku katastrofu. SAD koji je proizašao iz hladnog rada kontrolira informacije radi ekonomskih razloga – i ishod

je politička katastrofa. Ono što nastaje pod kombiniranim teretom patenata i autorskih prava je samo proširenje komodifikacije same.

To je kontekst u kojem se Stallmanovu Opću javnu licencu dade shvatiti kao istinski društveni hak. Ona je to u estetskom smislu te riječi utoliko što se koristi dostupnom materijom. Ona koristi zakon o autorskom pravu protiv njega samog, kao način da zaštiti ono nešto malo prostora za slobodu suradnju. Ona nije program ili manifest, ona je aplikacija. Stallman proširuje hakersku estetiku van sfere programiranja u društvenu sferu, ali na tom novom i većem polju nastavlja praksu hakiranja na manje više isti način. To je njegov genij.

> McKenzie Wark <

System.hack(4,"živi svijet", "Heath Bunting – Superweed Kit 1.0")*

> Velike korporacije sve više imaju moć odlučivanja i profitiranja nad golemim područjima ljudskog postojanja. Svojedobno zajednička dobra poput zemlje, vode i zraka danas se monopoliziraju. Tako je hrana zagađena GMO-vima uvedenim bez znanja javnosti.

Geni kontroliraju kemijske poruke unutar stanice, koje pak određuju oblik i funkciju same stanice, različitih organa u organizmu i konačno čitavog organizma. Ovi kodovi života sastavljeni su od četiriju građevnih blokova organiziranih u parove, poredane poput stuba spiralnog stubišta. Milijuni različitih kombinacija temeljnih kemijskih spojeva određuju različite genetičke strukture svake vrste organizma.

Genetski inženjering skup je tehnika i procesa za modificiranje ovih genetski kodova koji se primjenjuju na biljke, životinje, mikro-organizme, pa i ljudska bića. Kompanije poput Monsanta koncentrirane su na inženjering sjemenja koje u svom sastavu ima pesticide i herbicide, ili pak sjemenja koje čini biljke otpornijima na pesticide pa ih se može špricati u još većim količinama.

I pored stvarnih tehnologija zaštite protiv genetskog kopiranja, korporacije bez oklijevanja provode svoja prava intelektualnog vlasništva nad genetskim kodom, čak i ako zagađuju usjeve uzgajivača koji ne koriste njihovo sjemenje.

* Temeljeno na priopćenju za javnost povodom predstavljanja projekta u londonskom ICA-u u siječnju 1999.

Tradicionalna sredstva protesta uličnim prosvjedima i putem službenih kanala čine se neadekvatnima da bi došlo do promjene u današnjoj opasnoj i nedemokratskoj situaciji.

Kulturni terorizam može se definirati kao napad na dominantne sisteme moći i njihovu definiciju stvarnosti i prirode. Godine 1999. Michael Boorman iz Natural Realityja lansirao je *Natural Reality SuperWeed Kit 1.0* (*Prirodna stvarnost – Set za superkorov 1.0*) – uradi sam set koji omogućuje da se proizvede genetski modificirani superkorov, koji je napravljen da napada korporativne monokulture". Heath Bunting i Rachel Baker utemeljitelji su Cultural Terrorist Agency koja je financirala SuperWeed Kit 1.0.

Michael Boorman smatra da genetska hakerska tehnologija nudi sredstva za suprotstavljanje toj nesigurnoj, nepotrebnoj i neprirodnoj tehnologiji genetskog modificiranja organizama. Heath Bunting biotehnologiju naziva novim ratištem na kojem se vodi bitka za kontrolu nad životom i zemljom, ali i područjem na kojem se život sam redefinira. Bit svega krije se u konceptima vlasništva i reprezentacije, koji su na ovom poprištu ozbiljno dovedeni u pitanje.

Natural Reality SuperWeed Kit 1.0 sadrži mješavinu prirodnih i genetski modificiranih sjemena porodice Brassica (uljane repice, divlje rotkvice, žute gorčice, prave rusomače). Ako se tom sjemenju dopusti da nikne i međusobno križa, nastat će superkorov otporan na današnje herbicide koji potencijalno ugrožava profitabilnost GM usjeva, ali i proizvodnju i distribuciju herbicida.

Kako bi se suprotstavili prijetnji genetskog zagađenja koje izazivaju biotehnološke firme, ljudi se mogu suprotstaviti superkorovom sabotirajući komercijalne genetski modificirane usjeve. Riječ je o prirodno selektiranom korovu koji omogućuje ometanje uzgoja genetski modificiranih biljaka zasijavanjem 'superkorova' koji je prirodno otporan na GM herbicide. U ovom su projektu, prvi puta predstavljenom u ICA-u u Londonu, a onda i širom svijeta, kritičari prepoznali ključni susret suvremene umjetnosti i biotehnologije. 'Superkorov' posebno je aktualan sada, u vrijeme kada se formira javno mnijenje o tome pitanju, a vlade su u procesu odlučivanja o tome služe li znanstvena dostignuća u poljoprivrednoj proizvodnji uvijek dobrobiti čovječanstva.

SuperWeed mogao bi uništiti profitabilnost GM sjemenja, ali i onog konvencionalnog i organskog. Ova genetska

kontaminacija je nepovratna. Steve Kurtz iz Critical Art Ensemblea naziva ovakav pristup "biološkim građanskim neposluhom" te ovakvu novu metodu protesta, koja još nema čvrsta uporišta u teoriji i strategijama, smatra kockanjem reproduktivnim sistemima, ekosistemima i to na visoke uloge. Kurtz također kaže da je njegova grupa otvorena ovom tipu akcija, no s prethodno ispitanim utjecajem i etikom. Usprkos kritikama, Bunting vjeruje da je Superweed samo reakcija na postojeću realnost. Projekti poput ovoga podsjetnik su da su učinci GM-a postali predmetom moralne debate za većinu svjetske populacije.

Umjetnik **Heath Bunting**, poznati haktivist, odgovoran je za subverzivne informacijske kampanje protiv kompanija kao što su Glaxo, Nike i 7-Eleven prodavaonice, živi i radi u Bristolu u Velikoj Britaniji. Internacionalno je priznat kao jedan od pionira net.arta. Izlagao je i predavao po cijelom svijetu, s projektima koji uključuju grafite, performanse, intervencije, piratski radio. U jednom trenutku svoju djelatnost je usmjerio na genetiku, prozvavši je sljedećim 'novim medijem'. *Natural Reality Superweed kit 1.0* je važan doprinos umjetničkoj praksi koja predstavlja novo kreativno polje na granici znanosti i umjetnosti. Član je i osnivač irational.org kolektiva. Njegov glavni cilj je pronaći put kako da se svega odrekne i živi vani kako je bog i zamislio.

SuperWeed – Umjetnički projekt Heatha Buntinga

http://www.irational.org/cta/superweed/

> Dvoslovni prefiks niče sve češće u razgovoru kada je riječ o hrani. "GM hrana" iliti *genetski modificirana* hrana postala je standardni sastojak u većini prehrambenih prerađevina na tržištu. Od grickalica kao što je čips preko slastica do pakirane hrane, "75 posto hrane kupljene u Americi [i drugim zemljama] ima genetski promijenjene sastojke, [i pritom] promijenjene sastojke koji nisu navedeni na deklaraciji."[01] Zbog te nekonzistentnosti u deklariranju između mnogobrojnih proizvoda, postalo je nemoguće razlučiti što sadrži GM usjeve, a što ne. "Prema podacima proizvođača poljoprivrednih namirnica, gotovo svi proizvodi koji imaju sastojke od kukuruza ili soje, a i poneki koji imaju u sastavu repičino ili pamukovo ulje, imaju barem neki GM sastojak."[02] Iako to brzo postaje realnost, mnogo pitanja o usjevima i njihovom učinku na potrošače ostaju otvorena.

Unatoč pomutnji u javnosti oko toga koji usjevi sadrže promjene, argumenti za i protiv GM usjeva se gomilaju. Argumenti za takve usjeve baziraju se na porastu svjetske populacije i povećanoj potrebi za hranom. Budući da je teško zamisliti da bismo mogli obrađivati više zemlje no što to trenutno činimo, potreba da se poluči veći prinos po hektaru postaje bitna. GM usjevi omogućuju da dođe do povećanja uroda jer: 1) ti usjevi smanjuju pošast nametnika na usjevima, što zauzvrat povećava urod, 2) ti usjevi polučuju veće prinose od tradicionalnih usjeva, 3) nema potrebe za korištenjem pesticida budući da su biljke otpornije na nametnike. Argumenti protiv takvih biljaka sežu od nepoznanica oko posljedica po zdravlje uslijed konzumiranja modificiranih usjeva do nepoznanica oko njihovog porijekla – međutim, nema dokaza da su one štetne po ljude. K tome, javna potrošnja GM usjeva već je dosegla visoki udio kod većine prehrambenih prerađevina, pogotovu temeljnih namirnica kao što su šećer i brašno.

Kako se svijest o GM usjevima počela širiti, javili su se globalni pro-testi protiv takve hrane. Demonstracije u Genovi u Italiji u tamošnjem McDonaldsu[03] dovele su do toga da je ta multinacionalna korporacija obustavila nabavu GM sastojaka. Nedavno je ispitivanje na laboratorijskim štakorima koji su hranjeni GM usjevima pokazalo da se u kod životinja razvile anomalije na organima i promijenila krvna slika.[04] To je dovelo do obuhvatne zabrane GM proizvoda u Indiji. Kako se informacije o rezultatima kao što su ovi sve više javljaju diljem svijeta, tako raste i otpor primjeni GM usjeva u svakodnevnoj prehrani. Neslućeni strah pred onime što bi se još moglo pojaviti kao nuspojava konzumiranja tih proizvoda nadvladao je njihov potencijal da ponude odgovor na globalnu prehrambenu krizu.

Kao odgovor na zabrinutost GM prehrambenim proizvodima, rad britanskog umjetnika Heatha Buntinga "SuperWeed – Superkorov" bavi se pitanjem prijetnje koju ti usjevi donose kada uđu u prehrambeni lanac tako da ilustrira utjecaj tih usjeva na njihov neposredni okoliš. Bunting je ponajprije pratio nekoliko mailing lista o GM usjevima ne bi li saznao što ljude brine kad je riječ o povećanoj upotrebi GM-a. Bunting objašnjava kako je započeo s projektom "Htio sam napraviti biotehnološku inter-venciju, zbog čega sam mjesecima pratio nekoliko relevantnih mailing lista gdje se između ostalog raspravljalo i o superkorovima, pa sam se zbog toga dao u detaljnije istraživanje i odlučio napraviti svoj superkorov."

Rezultat Buntingovih nastojanja "SuperWeed" "sadrži mješavinu prirodnih i genetski modificiranih (GM) sjemena porodice Brassica (uljane repice, divlje rotkvice, žute gorčice, prave rusomače). Ako se tom sjemenju dopusti da nikne i međusobno križa, nastat će superkorov otporan na današnje herbicide (kao što je *Roundup*[05]) koji ugrožava ne samo profitabilnost konvencionalnih i GM usjeva Brassice, već i proizvodnju i distribuciju herbicida."[06] S ovim projektom njegova je nakana bila zagovarati onaj tip biološkog terorizma gdje "[a]ko osjećate da vlasti neće poštivati volju većine stanovništva za zabranom GM usjeva (trenutno je 77% za potpunu zabranu), možete odlučiti da uzgojite i oslobodite u okoliš SuperWeed 1.0."[07] Iako se to možda nekima čini antagonizirajućim pristupom, Bunting djeluje prema uspostavljanju ravnoteže između GM usjeva i njihove prirodne sredine, budući da prirodni korovi nemaju izgleda da utječu na današnje GM usjeve.

01 *News Target*, "Genetically modified foods more common than many Americans think, survey shows", http://www.newstarget.com/006073.html

02 "Survey: Most folks unaware they have been eating biotech foods for years", Associated Press, March 24, 2005, http://www.journalnow.com/servlet/Satellite?pagename=WSJ%2FMG Article %2FWSJ_BasicArticle&c=MGArticle&cid=1031781758183&path=!nationworld&s=1037645509161

03 *Organic Consumers Association*, "Mass Protests Against Frankenfoods in Italy", http://www.purefood.org/ge/italyprotest.cfm

04 "Food for thought: Report reveals risks of GM items", *Times of India*, 4. lipnja 2005., http://timesofindia.indiatimes.com/articleshow/1132155.cms

05 http://www.monsanto.com/monsanto/layout/products/productivity/roundup/default.asp

06 "Rise of 'Superweeds' blamed on GM crops": http://millennium-debate.org/ind5feb02.htm

07 Buntingova internetska stranica: http://www.irational.org

25

Unatoč tom naizgled krajnje taktičkom pristupu, Bunting vjeruje u diplomaciju kao metodu da se korporacije obeshrabri od ulaganja u GM proizvode. Kao što kaže, "možete se alternativno odlučiti da pokrenete vlastitu propagandnu kampanju prijeteći biotehnološkim korporativnim interesima tim genetskim oružjem. Što god da učinili, prijetnja je često podjednako učinkovita kao i primjena."[08] I čini se da takav pristup djeluje, kao što pokazuje recentni članak o projektu "SuperWeed" u New York Timesu gdje se prenosi kako se istraživač s MIT-a Joe Davis, "otac američke bioumjetnosti"[09], očitovao protiv "SuperWeeda" kazavši: "Nije mi jasno zašto [Bunting] nije bio uhapšen. Pretpostavimo da sam ja protiv benzinskih pumpi. Bi li mi to davalo za pravo da se vrzmam po njima s kutijom šibica u rukama?"[10] Taj tip reakcije, iako naizgled negativne, indikator je trenutnog *hypea* oko tih usjeva i toga koliko je daleko uznapredovala njihova integracija u popularnu kulturu.

Zašto se onda upuštati u takav projekt? Bunting uzvraća: "GM je opasan po zdravlje svih životinja i biljaka." On je uvjerenja da je na socijalnoj razini "GM primarno mehanizam kolonizacije koju provode bogati kriminalci." Ta pretpostavka

odnosi se na sklonost proizvođača hrane da koriste GM usjeve kako bi izbjegli skupe procese odvajanja nejestivih proizvoda od onih koje je vrijedno izbaciti na tržište. Također GM urodi hipotetski donose više profita, budući da su GM usjevi tipično obilniji i izdašniji od usjeva koji nisu GM. Međutim, koliko donose na veličini toliko oduzimaju na okusu u usporedbi sa svojim precima.

Trenutno korporacije koriste GM usjeve kao način povećavanja godišnjeg uroda i time profita na uložena sredstva. One također predlažu GM usjeve kao metodu poboljšanja "hranidbenog sastava usjeva, kao što je proteinski sastav riže ili krumpira, ili povećanja otpornosti usjeva na nepovoljne uvjete za rast, kao što su suša ili nametnici."[11] Druge tvrdnje, usmjerene na umirivanje negodovanja javnosti, glase "da [GM usjevi] poboljšavaju čulna svojstva hrane, to jest okus i teksturu, [te također] poboljšavaju preradbena svojstva ne bi li se umanjio udio otpadnih sastojaka u hrani i minimalizirao trošak pri prijevozu i skladištenju."[12]

Korporacija koja predvodi razvoj GM usjeva je Monsanto, koja je smještena u St. Louisu, saveznoj državi Missouri. "Monsatov razvoj i izbacivanje na tržište genetski modificiranog sjemena i kravljeg hor-

mona rasta, kao i njegove agresivne pravne i lobističke prakse učinile su Monsanto primarnim ciljem antiglobalističkog pokreta i aktivista koji se bore za okoliš."[13] Primjerice, Američka udruga potrošača organske hrane (Organic Consumers Association of America, skraćeno OCA) pokrenula je peticiju pod motom "Milijuni protiv Monsanta" ohrabrujući uzgajivače i potrošače na kampanju protiv te korporacije. Njihovi zahtjevi u peticiji glase: "1) prestanite zastrašivati male obiteljske uzgajivače, 2) prestanite siliti potrošače da konzumiraju neispitanu i nedeklariranu genetski modificiranu hranu, 3) prestanite koristiti milijarde dolara američkih poreznih obaveznika kako biste poticali genetskim inženjeringom modificirane usjeve – pamuk, soju, kukuruz i repicu."[14]

Iako se ti usjevi koriste u proizvodima brze prehrane i u prehrambenim prerađevinama koje prosječni potrošač često ne koristi, kompanija je optuživana da ne objavljuje rezultate ispitivanja tih usjeva na laboratorijskim životinjama. "Prema londonskom dnevniku Independent, koji je priču i iznion na svjetlo dana, tajno istraživanje koje je Monsanto proveo pokazuje da su štakori hranjeni modificiranim kukuruzom

imali manje bubrege i oscilacije u sastavu krvi."[15] Ti tipovi nalaza postavljaju pitanje o dugoročnim učincima koje će ti usjevi imati na ljude jednom kada u potpunosti budu integrirani u prehrambeni lanac. Ta je rasprava tematiku GM hrane pretvorila u svjetsku problematiku.

Iako se Bunting svojim djelom protivi GM usjevima, projekt ipak uvodi vlastiti oblik GM usjeva u prirodni okoliš. Rezultat tog puštanja u okoliš mogao bi biti katastrofalan već sam po sebi. Bunitingov superkorov mogao bi se teorijski križati stvarajući time hibridnu GM biljku. Tako stvorena biljka mogla bi predstavljati čak i veću prijetnju od prvotne. Unatoč kritikama upućenim projektu, Bunting smatra da je "Superweed" naprosto reakcija na već postojeću stvarnost. Osvrćući se na činjenicu da je njegov "Superweed" također GM biljka, on bez libljenja kaže "Gerilsko ratovanje koristi naprijateljevo oružje."

Kako se debata oko GM usjeva zahuktava, tako se javlja i potreba da se preispita fundamentalna široka primjena tih usjeva. Projekti poput Buntingovog "SuperWeeda" podsjećaju da su učinci GM-a postali predmetom etičke debate za veći dio svjetske populacije. Unatoč činjenici da bi većina ljudi rekla da nikada

08 Ibid.

09 [Preuzeto iz *New York Timesa*]
http://www.nytimes.com/2005/07/03/arts/design/03kenn.html/ , 3. lipnja 2005., "The Artists in the Hazmat Suits", autor Randy Kennedy

10 Ibid.

11 http://library.thinkquest.org/C004033F/pros&cons_text.htm

12 Ibid.

13 *Wikipedia:* "Monsanto, Genetically Modified Food" (http://en.wikipedia.org/wiki/Monsanto)

14 "Monsanto to Public: Ignore the Rats and Eat the GMO Corn
OCA Reacts to Monsanto's Latest GMO Deception", *Organic Consumers Association:* http://www.organicconsumers.org/monlink.html
http://www.organicconsumers.org/ge/corn-study.cfm/7645509161

15 Ibid.

nisu konzumirali GM hranu, stvarnost je međutim ta da njena integracija u komercijalne proizvode već postaje široko rasprostranjena. Buntingovo djelo pokazuje da je predmet te debate dovoljno ozbiljan da od nadležnih vlasti iziskuje rasvjetljavanje izravnih posljedica uslijed dugotrajnog konzumiranja tih usjeva. Iako se čini da ti usjevi nemaju potvrđenih štetnih posljedica, široko je rasprostranjeno podazre-

nje da ih se svjesno kuša. U kontekstu stalno novog integriranja tih usjeva u prehrambeni lanac, projekti poput "SuperWeeda" podsjećaju da GM usjevi neće nestati i da se mi moramo ili prilagoditi (ili reagirati) na njih. Unatoč našim brojnim protestima, mi već imamo i mi već konzumiramo te usjeve. A uz postojani porast globalne populacije ta će realnost postati sve prisutnija i nepobitnija.

> Jonah Brucker-Cohen <

28

System.hack(5, "zaključavanje","Michael Steil – Linux na Xboxu")

"Zovem se Michael Steil i zakonski sam vlasnik Xboxa. U potpunosti sam platio njegovu punu cijenu i posjedujem 6 originalnih igara. Živim u Evropskoj Uniji i nikada nisam potpisao nikakav Licencni ugovor s krajnjim korisnikom (*End User License Agreement* – EULA) niti bilo kakve Uvjete usluge (naime, nisu došli u paketu s Xboxom), pa tako nisam ograničen nikakvim ugovorom. Stoga Xbox smatram svojim osobnim vlasništvom. (Svjestan sam da bi Microsoft mogao polagati prava na neka ograničenja u Sjedinjenim Američkim Državama, no budući da sam ja građanin EU, nastanjen u EU, bilo kakva ograničenja na upotrebu Xboxa opisana u bilo kakvom EULA-u nisu primjenljiva, kao niti njihova upitna legalnost u SAD-u i šire. Samom upotrebom Xboxa ne znači da ja na njih i pristajem.) Također treba naglasiti da moj Xbox nije 'modificiran' ni na koji način."
— Michael Steil, 10. listopada 2003.

> Michael "mist" Steil živi u Münchenu, bavi se računalima od svoje desete godine, započeo je na Commodoreu 64 i oduvijek su ga zanimali mikroprocesori, ugrađeni sustavi i operativni sustavi. Voditelj je projekata Xbox Linux i GameCube Linux. Gore citirani pasus njegov je javni protest zbog prepreka na koje je naišao pri korištenju Xboxa. Steil je

naime na Xbox instalirao GNU/Linux operativni sustav. Xbox je jednom prilikom «samoinicijativno» ponudio mogućnost *upgradea*, a Steil je nesmotrenim klikom pokrenuo učitavanje novije verzije nakon čega su njegovi podaci iz GNU/Linux sustava instaliranog na Xboxu nestali. Ovakvu intervenciju izazvanu postavkama na Xboxu Steil je doživio kao atak proizvođača na privatno vlasništvo, u ovom slučaju njegovo vlasništvo i to ga je potaklo na reakciju.

Xbox je Microsoftova igrača konzola. Kada je krajem 2001. izašao na tržište, Xbox je u sebi krio za to vrijeme moćno osobno računalo s Intel Celeron procesorom na 733 MHz, 8GB do 10GB tvrdog diska, 64MB RAM-a i 4 USB ulaza (Xboxovi kontrolni ulazi su samo varijacije standardnih USB 1.1 ulaza). Microsoft je Xbox ponudio bitno ispod tržišne cijene takvog osobnog računala, računajući da će gubitak nadoknaditi prodajom igara za konzolu i preuzimanjem prevlasti na tržištu igračih konzola (dakle, prevlasti u *de facto* standardu) od Sonyevog PlayStationa.

Uvidjevši mogućnost da dođu do jeftinog hardvera za postojeći slobodni softver, čiju bi nabavku – koje li ironije – dotirao upravo najveći protivnik slobodnog softvera – Microsoft, hakerska zajednica primila se zadatka da prilagodi GNU/Linux kako bi mogao raditi na Xboxu. Društveno-razvojni značaj jeftinog hardvera s besplatnim slobodnim softverom za siromašne krajeve svijeta bio je očigledan. Međutim, upravo da bi onemogućio pristup jeftinom hardveru na svoj trošak i spriječio da jeftini hardver ugrozi tržište osobnih računala, Microsoft je taj moćni stroj onesposobio da ne bi mogao poslužiti bilo kojoj drugoj namjeni osim jedne – igranju.

Xbox koristi klasični sigurnosni sustav zaključavanja gdje hardver prihvaća samo digitalno potpisani kod, u ovom slučaju, naravno, Microsoftov digitalno potpisani kod. Takav tip sigurnosne tehnologije naziva se sigurnosno računarstvo. I premda omogućuje mnoge sigurnosne primjene u računarstvu, on korisniku oduzima mogućnost kontrole nad njegovim vlastitim hardverom i pretvara ga, kako to Richard Stallman kaže, u računalo u koje korisnik ne može imati sigurnosti. Upravo je takav sigurnosni sustav pobrisao podatke GNU/Linux operativnog sustava na Steilovom Xboxu i natjerao ga u bijes.

Kako bi se suprotstavilo nesagledivim posljedicama masovnog uvođenja takvih sigurnosnih sustava u potrošačku elektroniku, posljedicama s kakvima se danas već suočavamo u vidu različitih tehnoloških sustava zaštite intelektualnog vlasništva, tzv. *Digital Rights/Restrictions Management* sustava, a ujedno i iskoristila prilika da se dođe do jeftinog hardvera za slobodni softver, Michael Robertson, direktor *open source* kompanije Lindows, početkom 2003. raspisao je nagrade od po 100.000 dolara za onoga tko prvi uspije instalirati GNU/Linux na Xbox uz hardversko modificiranje i za onoga tko to prvi uspije bez hardverske modifikacije. Dugo vremena tzv. modčipovi bili su jedina opcija, no kasnije se pokazalo da TSOP čip na kojemu se nalazi Xboxov BIOS može biti obrisan. Naposljetku su slabosti otkrivene u jednoj igri omogućile da se GNU/Linux pokrene na Xboxu bez hardverske intervencije. Upravo je to uspjelo Steilovom Xbox Linux timu.

U međuvremenu više je takvih projekata koji iz sve moćnijih uređaja potrošačke elektronike nastoje instalacijom slobodnog softvera osloboditi snažna računala koja se kriju iza zaključanog hardvera – iPodLinux je danas vjerojatno najpopularniji.

Krajem 2005. Microsoft je objavio novu generaciju svoje igrače konzole Xbox 360. Početkom 2006. pokrenut je projekt njenog oslobađanja: Free60.

Kako prodati slobodu

> Otkad je zagovornika slobode softvera, svako toliko neki se entuzijast upusti u nabrajanje vrlina slobodnog softvera, u pravilu s ciljem da pokaže kako sloboda softvera donosi mnoge prednosti za korisnike, programere i tvrtke. Implicitno ili eksplicitno, takvi manifesti gotovo beziznimno sadrže očekivanje predstojeće softverske revolucije, od koje nas dijeli tek nedovoljna osviještenost masa korisnika računala.

Ni u jednom takvom razmatranju, koliko mi je poznato, ne otvara se prethodno pitanje: zašto, uza sve te prednosti, slobodni softver nije društveno uspješniji, odnosno, zašto je manje uspješan od neslobodnog? Kao što je poznato, najuspješniji informatički projekti u posljednjih četvrt stoljeća nisu bili slobodni, dapače nisu imali nikakve veze sa slobodnim softverom. Sloboda softvera u društvenom smislu jest i bila je relativno efemerna pojava. Imajući u vidu komponentu socijalne organizacije u njegovom razvoju i ciljevima, to uopće nije samorazumljiv ishod.

Društveni uspjeh definirat ćemo kao spoj masovnosti i inovacije, a dinamiku informatičke ekonomije prikazat ćemo u terminima komplemenata i supstituta. Pokazat ćemo kako iza najuspješnijih proizvoda u mladoj povijesti mikroračunarstva stoje dobri hakovi, manipulacije komplementima i supstitutima. U tom ćemo kontekstu zasebno prokomentirati i smisao Xbox Linuxa.

Najkraća povijest mikrokompjutera ikad

Mikrokompjuteri su se od kraja sedamdesetih razvijali na dva kolosijeka upotrebe, kućnom i školskom, odnosno poslovnom. Apple II (1977) postao je standardnom školskom opremom u Sjedinjenim Državama, a program za tabelarne izračune VisiCalc kasnije ga je pomalo uveo i u poduzeća. Tamo je raznorazne kompjutere (zajednički im je bio procesor Zilog) pogonio operativni sustav CP/M (1976), prvi poslovni operativni sustav za mikorokompjutere. Za CP/M je napisano brdo poslovnog softvera, od revolucionarne baze podataka dBASE, preko jednako revolucionarnog programa za obradu teksta WordStar, do verzije VisiCalca za CP/M.

Na scenu 1981. ulazi IBM s otvorenom PC-arhitekturom, Microsoftovim klonom CP/M-a i Intelovim jačim procesorom. Nezavisni proizvođači stvaraju hrpu jeftinih dodataka za PC, čime bitno povećavaju vrijednost investicije u sam PC (više o ovoj ekonomskoj strategiji poslije). Sav bitni softver za CP/M izlazi u novim verzijama za DOS, i do kraja osamdesetih PC-ovi (IBM-ovi ili ne) nalaze se u svakom uredu i školi. Otprilike istodobno s pojavom PC-a otvara se treći veliki segment tržišta, kućna računala, koji se razvija uglavnom nezavisno. Sredinom osamdesetih Apple izbacuje Macintosh, prvo mikroračunalo s grafičkim sučeljem. Potkraj osamdesetih tržište igara pomalo prelazi na PC i DOS.

Microsoft 1992. izbacuje Windows 3.1 i objedinjuje sve segmente tržišta mikrokompjutera, i prvi put na jednom te istom stroju možete raditi sve: pisati, crtati, računati, igrati se, a sve to uz pomoć grafičkog sučelja. Svi programi za DOS rade na Windowsima bez ikakvih intervencija i ulaganja. A budući da svi kupci sada trebaju manje-više sličan stroj, kompjuteri konačno postaju jeftini, barem za žitelje ove strane digitalnog jaza.

Od sredine devedesetih operativni sustavi za osobna računala pomalo prelaze na minikompjuterski model, koji predviđa pravi višezadaćni i višekorisnički rad te punu umreženost. Prvi je bio Microsoft 1993. (Windows NT, na arhitekturi naslijeđenoj od VMS-a), zatim zajednica slobodnog softvera sa svojom verzijom Unixa (GNU s kernelom Linuxom, efektivno krajem devedesetih), a posljednji Apple (Mac OS X, 2001), također naslanjajući se na Unix.

Društveni utjecaj

Za potrebe ove rasprave, društveno utjecajnom tehnologijom smatrat ćemo onu koja zadovoljava dva kriterija: masovnost i novost. Oba pojma su relativna: Apple II jest bio društveno utjecajan jer su se prije njega kompjuterom služili samo inženjeri, bankari, vojska, te poneki osobito spretni studenti informatike koji su svoje kompjutere izrađivali sami; CP/M nije bio društveno utjecajan jer se njime služila tek manjina tajnica i knjigovođa, iako u tehničkom smislu jest bio novost. Windows 3.1 bili su društveno utjecajni jer su svim segmentima tržišta ponudili ergonomski superiorno grafičko sučelje,[01] uz potpunu kompatibilnost s DOS-om.

Gdje je na toj karti slobodni softver? U biti, nigdje. Od 1983. do danas, slobodni softver s aspekta društvenog utjecaja (dakle masovnost plus novost) nije proizveo ni jedan jedini skok. Danas najrasprostranjeniji slobodni softver čine programi kao što su web-server Apache i (prema zastupljenosti, u puno manjoj mjeri) Mozillin web-klijent Firefox. Iako je s procvatom Interneta, osobito weba, softver vezan za taj segment upotrebe znatno dobio na važnosti, i Apache i Firefox društveno su zapravo nevažni. Zašto? Zamislite na čas da ih nema. Što se promijenilo? Ništa. Isti broj ljudi manje-

33

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01 Superiorno u odnosno na sučelje DOS-a, ne nužno na druga grafička sučelja koja nisu bila masovno korištena.

više jednako pregledava isti broj web-stranica koje se i dalje manje-više jednako poslužuju.[02]

Pravde i poštenja radi, mislim da postoji jedan društveno utjecajan slobodan softver: to je Wiki Warda Cunninghama. Wiki je istinski inovativan i u ovih dvanaest godina više nego masovno iskorišten koncept, koji je doživio nebrojene varijacije i poneke doista spektakularno utjecajne primjene (npr. Wikipedia).[03]

Kako objasniti izostanak uspjeha slobodnog softvera u svjetlu činjenice da sloboda softvera zaista donosi velike potencijalne prednosti za korisnika? Neslobodni softver je zatvoreni „proizvod" (izvršni kod) koji je nečije intelektualno vlasništvo, a vlasnik nas ovlašćuje da taj proizvod koristimo pod uvjetima koje je propisao – to, naime, kupujemo kad kupujemo korisničku. Naprotiv, licenca slobodnog softvera ne regulira način upotrebe softvera pa s programom možemo raditi skoro sve što poželimo. (U slučaju softvera pod licencom GPL, "skoro sve" znači "uz jedini uvjet da, ako distribuiramo izmijenjeni program, taj program također ponudimo pod GPL-om".[04])

Za dobro rasprave, pretpostavimo da imamo jedan tipični vlasnički softverski proizvod s jedne strane, a s druge istovjetan slobodni program. Nadalje, pretpostavimo da nas i jedan i drugi koštaju isto. Gledajući samo na ovlaštenja (dakle, ako je sve ostalo jednako), slobodni program za korisnika uvijek ima veću ili jednaku vrijednost.[05] Jednaku vrijednost, naime, imali bi jedino u slučaju da sa slobodnim programom nikad ne poželimo učiniti baš ništa što nam vlasnik i inače ne bi dopustio. U svim ostalim slučajevima, slobodni softver je za korisnika, dakle u upotrebnom smislu, vredniji od istovjetnog neslobodnog softvera.[06]

Ako je, dakle, slobodni softver načelno vredniji, poželjniji od neslobodnog, zašto je društveno manje uspješan od neslobodnog? Odnosno, što su prepreke većoj masovnosti i većoj razini inovacije u slobodnom softveru? Pokušat ćemo odgovoriti na ta pitanja na osnovi dvaju izvora problema: svojstava zajednice korisnika/stvaralaca slobodnog softvera, te specifičnosti ekonomije slobodnog softvera.

Tradicija, društvo, zajednica

Zakoračimo na čas u povijest nastanka slobodnog softvera. Richard Stallman, programer s uglednog Masačusetskog instituta za tehnologiju (MIT), osmislio je projekt GNU tako da su obje mete (masovnost plus novost) već u početku bile promašene. GNU je, naime, težio nadomjestiti razvojnu okolinu postojećih neslobodnih Unix-sustava, a ne stvoriti nešto novo. Drugo, Unix je bio (i ostao sve donedavno, do Appleovog Mac OS X-a) operativni sustav namijenjen prvenstveno informatičarima i drugim znanstvenicima vičnim informatici, a ne laicima. Razlika u odnosu na društveno utjecajna osobna računala je očita: Apple II se obraćao učenicima i učiteljima, DOS računovođama i drugim uredskim radnicima, a Windows igračima, likovnjacima, glazbenicima, govornicima i svima ostalima. Etos svijeta Unixa i svijeta osobnih računala se otpočetka znatno razlikuje: uniksaši cijene i očekuju informatičke vrline, a korisnici osobnih računala lakoću korištenja pri konkretnim zadacima koji sami po sebi nemaju nužno veze s informatikom.

Osobito isključiv stav prema informatičkim laicima eksplicitno je zauzeo ni manje ni više nego Stallman, koji smatra da je koristiti neslobodni softver samo po sebi nemoralno. Time pred, recimo, umjetnika postavlja moralni zahtjev da koristi slobodni softver iako je prilagođen informatičaru a ne umjetniku i time ga efektivno sputava (ili naprosto treba zatomiti svoj dar čekajući da se pojavi odgovarajući softver). Osim što je moralno upitan, jasno je da ovaj tip tehno-autizma ne pridonosi komunikaciji s korisnicima obdarenim drugim talentima i manje zainteresiranima za tehnologiju kao takvu.

Općenito, tradicionalni korisnici slobodnog softvera njegovi su stvaraoci, bilo izravno, tako da ga koriste sami autori, bilo neizravno, da od korisnika očekuju razinu informatičkog znanja usporedivu s razinom znanja samog autora. To može biti upravo sjajno: osobama koje približno odgovaraju opisu idealnog korisnika nekog slobodnog softvera, takav softver često savršeno odgovara. Da ste programer čiji je primarni jezik LISP, možete li zamisliti bolju radnu (i neradnu) okolinu od Emacsa, programa za rad sa svim oblicima teksta, koji je napisan u jednom dijalektu LISP-a i vama je potpuno razumljiv, prilagodljiv i proširiv. Onaj djelić promila u ukupnoj populaciji koji odgovara tom opisu u Emacsu se vjerojatno osjeća kao u raju.

Kako odmičemo od sretnog spoja programera, odnosno informatičara, i primarnog korisnika, ova ideja se pomalo pretvara u noćnu

02 Poznavatelji slobodnog softvera sad će protestirati – programski kod Apachea i Firefoxa je i dalje tu, slobodan za sve daljnje primjene, čak i da se fondacije Apache i Mozilla ugase. Štoviše, to je značajni *feature*, a ne *bug*. Ali, ja želim reći nešto drugo: čak i da sav taj kod odjednom nestane, uključujući i izvršne programe, čak i da se magično izbriši sva sjećanja na elemente tih programa kod svih njegovih programera, svejedno se ne bi ništa dogodilo. Ni zamisao, ni prva izvedba, ni neko revolucionarno unapređenje web-poslužitelja nisu nastali unutar projekta Apache. Isto vrijedi i za Mozillin web-klijent.

03 http://en.wikipedia.org/wiki/Wiki

04 http://www.gnu.org/philosophy/free-sw.hr.html

05 Ovdje izlažemo argument iznesen na Usenet grupi hr.comp.gnu 19. prosinca 2002, u poruci pod naslovom "SOK i MESO za velike kupce".

06 U prilog slobodnog, odnosno *open-source* softvera, njegovi zagovornici obično se pozivaju na druga dva kriterija. Zaklada za slobodu softvera (FSF), slijedeći misao Richarda Stallmana, tvrdi da je slobodni softver jedini moralan softver, kako za stvaraoce tako i za korisnike. Inicijativa za otvoreni kod (OSI) pak tvrdi da je razvojni model svojstven slobodnom ili *open-source* softveru superioran razvojnim modelima vlasničkog softvera. Smatramo da je prvi stav besmislen, a drugi empirijski neosnovan.

34

35

moru. Danas je slobodni softver toliko razvijen da se njime može napraviti gotovo sve, pitanje je samo tko i kako. Fotograf koji radi s nekim od specijaliziranih neslobodnih programa za grafičku obradu, kad hoće eksperimentirati s dinamičkim rasponom fotografija, može odabrati odgovarajuću stavku s izbornika ponuđenih specijalnih efekata, i bez previše poznavanja tehnologije isprobati željeni postupak. Korisnik slobodnog softvera postići će sličan rezultat tako da se podrobno informira o fizici i tehnologiji dinamičkog raspona u fotografiji, ovlada osnovama nekog od skriptnih jezika, pronađe odgovarajuće programčiće i poveže ih na željeni način, na primjer ovako:[07]

```
#!/usr/bin/perl
open I, "> /tmp/hdr-in";
for $f (@ARGV) {
$jh=`jhead -c "$f"`;
chop $jh;
if($jh=~/\(1\/(\d+)\) f\/([\d.]+)/) { $e=$1; $a=$2; }
if($e<2) {
$jh=`jhead "$f" | grep "Exposure time"`;
if($jh=~/:.*?([\d.]+).*?s/) { $e=1/$1; }
}
$n=`basename "$f" .jpg`; chop $n;
print I "$n.ppm $e $a 0 0\n";
print "preparing $n (1/$e f/$a) ...\n";
system "convert '$f' -geometry 1024x1024 '/tmp/$n.ppm'";
$d=`dirname "$f"`; chop $d;
}
close I;
system "cd /tmp; mkhdr -fptiff hdr-in $d/$n-HDR.tiff";
system "pfsin $d/$n-HDR.tiff | pfstmo_fattal02 -b 0.85 | pfsgamma -g
2.2 | pfsout $d/$n-HDRfattal.jpg";
system "pfsin $d/$n-HDR.tiff | pfstmo_drago03 | pfsgamma -g 2.2 |
pfsout $d/$n-HDRdrago.jpg";
```

Što mislite, koji će pristup korisniku dovesti do većeg društvenog uspjeha, popularizacije kompjuterske obrade fotografije?

Po našem sudu, ni najjača ni najslabija točka slobodnog softvera nemaju puno veze s programiranjem. Glavna vrlina slobodnog softvera je društvena, a glavni doseg stvaranje zajednice korisnika/stvaralaca slobodnog softvera. Glavni problem je u onome što programeri ne znaju ili ih jednostavno ne zanima. Za društveni uspjeh slobodnom softveru trebaju neprogrameri i neinformatičari: dizajneri sučelja i psiholozi koji će ga testirati; jezikoslovci koji će napraviti pošten sustav za provjeru pravopisa i gramatike, a po mogućnosti i bazu sinonima i antonima; i tako dalje. Njihov će doprinos značajno pomoći da se laicima olakša pristup slobodnom softveru. No, kako ćemo vidjeti, ni sve to neće biti dovoljno dok slobodni softver na zadobije bolje ekonomske temelje.

Ekonomija slobodnog softvera

Najveći dio ekonomije slobodnog softvera, i dobar dio informatičke ekonomije, vrti se oko pojmova komplementa i supstituta, te procesa komodifikacije, odnosno pretvaranja u robu.[08] Veliki "hakovi" u IT-ekonomiji djeluju kao manipulacije s komplementarnim proizvodima. Osnovni princip ekonomije komplemenata je: što su komple-

menti nekog proizvoda jeftiniji, to on može biti skuplji. Tako je IBM, kako smo napomenuli, PC-arhitekturu učinio otvorenom i tako otvorio tržišnu utakmicu za hardverske dodatke svim nezavisnim proizvođačima. Dostupnošću velikog broja raznih kartica za PC sam je PC dobio na vrijednosti. No, istodobno je Microsoft izveo još bolji štos: IBM-u nisu dali ekskluzivnu licencu na DOS, nego su je prodavali i konkurentskim tvrtkama, kako bi spustili cijenu hardvera i time podigli vrijednost (svog) softvera.

I dok je igra komplemenata važan sastojak u kuhanju najuspješnijih informatičkih proizvoda, za slobodni softver to je jedini raspoloživi ekonomski model. Bitno ograničenje restriktivnijih slobodnih licenci odnosi se, naime, na strogo propisan način distribucije slobodnog softvera koji efektivno onemogućuje standardni poslovni model prodaje „licenci za krajnjeg korisnika". Drugim riječima, za tvrtke kojima je primarni biznis proizvodnja softvera za masovnu distribuciju, slobodni softver je neupotrebljiv, barem u svojim restriktivnijim licencama kao što je GPL.

Stoga IBM i mnoge druge manje tvrtke danas pokušavaju odigrati još jednu varijantu trika s komplementima ulaganjem u slobodni softver, prodajući konzultantske, projektantske i druge stručne usluge temeljene na slobodnom softveru kao jeftinom

07 Primjer nije izmišljen, skripta je pod GPL-om i stvarno radi. Autor je fizičar i fotograf Domjan Svilković. Izvor: hr.rec.fotografija.digitalna, 21. travnja 2006, pod naslovom *High Dynamic Range*.

08 Roba u ovom smislu je proizvod koji je pao na najnižu moguću, robnu cijenu. Više o tome u udžbeničkom izlaganju programera, biznismena i pisca Joela Spolskog, v. http://www.joelonsoftware.com/printerFriendly/articles/StrategyLetterV.html.

odnosno besplatnom komplementu. Najveći profiter na slobodnom softveru je vjerojatno ipak Google koji šakom i kapom ulaže u slobodni softver, koristeći ga u serverskoj, a sve više i komplementarno, u klijentskoj (preglednik Firefox) infrastrukturi svog oglašivačkog carstva.

Sudeći po financijskim izvještajima, takva strategija se isplati. Međutim, IBM-ove i Googleove mušterije su veliki poslovni sustavi odnosno oglašivači, a ne "mali potrošači". Za većinu korisnika softvera i većinu primjena, najbolji dostupni softver i dalje pripada kategoriji neslobodnog softvera. Iako stoji da svako poboljšanje koje proizlazi iz poslovanja sa slobodnim softverom donosi neku korist cijeloj zajednici, obično nije riječ o stvarima koje bi se obraćale masovnom tržištu.

• SIVA ZONA

Uspjeh u igri s komplementima nije zajamčen, osobito u standardiziranom infrastrukturnom okruženju, u kojem "sve radi sa svim". Stoga si brojni proizvođači nastoje olakšati posao tako što otežavaju korisnicima upotrebu onoga, što bi trebalo biti komplementarno njihovom i samo njihovom primarnom proizvodu, u korist nečeg ili nekog drugog.

Mobilni telefon je komplementaran upotrebi telekomunikacijskih usluga, pa telekomi redovito nude telefone po višestruko nižoj cijeni od maloprodajne. U čemu je kvaka? U tome što su „njihovi" uređaji zaključani na njihovu mrežu pa se ne

mogu iskoristiti kao komplement za usluge drugih operatera, iako su sve aktualne mreže za mobilnu telefoniju potpuno standardizirane i svaki uređaj izvorno može raditi u mreži bilo kojeg operatera.

Zaključavanje mobitela tek je jedan od vidljivijih oblika prljave igre s komplementima. U kontekstu informatičke tehnologije, među perfidnijima je uvođenje posebnih vlasničkih mrežnih protokola, kao što su Microsoftov SMB ili svojedobno AppleTalk ili Novellov IPX. Ideja je slična: ako trebate povezati više računala u mrežu, bit će nam drago udovoljiti vam. Pod uvjetom da za svaku radnu stanicu kupite naš softver (Windows ili nekad Novell), ili još bolje, i naš softver i naš hardver (Macintosh i MacOS kod AppleTalka). Sudbina ovakvih podvala dosad nije bila ružičasta: IPX i AppleTalk su srećom propali, a SMB još, nažalost, nije.

U svijetu igraćih konzola, takvo zaključavanje komplemenata je posve normalna stvar. Nintendo, Sony i odnedavno Microsoft prodaju relativno jeftine konzole da bi zaradili na relativno skupim igrama. Analogno mobilima, Microsoftov Xbox je tehnički gledano standardni PC koji je zaključan za svaku primjenu osim one koja ključaru donosi dobit. To, jest, bio je zaključan dok ga ekipa Xbox Linuxa nije otključala.

Osim kao gesta otpora Xbox-linuksaša jednom obliku reketarenja u informatičkoj industriji, ovaj projekt je zanimljiv i po tome što je

zapravo posve bezopasan za Microsoft. Postoji brdo načina da se sastavi skoro jednako jeftin stroj za Linux, koji će obično puno bolje odgovarati željenom zadatku od ex-Xboxa pa ne vjerujem da je imalo značajan broj ljudi kupio Xbox *samo* kao Linux-stroj. Kao ciljna publika Xbox Linuxa tako ostaju samo linuksaši koji su i igrači, a oni će ionako morati kupiti igre ako se žele igrati na Xboxu. Čemu je onda imalo služiti zaključavanje? U slučaju konzola – ničemu. To pokazuje Xbox Linux, a još više činjenica da je dominantna tvrtka na tržištu igraćih konzola, Sony, ionako službeno podržala Linux za Playstation 2 pa zbog toga nije prestala biti dominantna.

• ŠTO, KAKO I ZA KOGA

U svojoj dosadašnjoj povijesti, računarstvo je donijelo goleme promjene u načinu na koji učimo, zabavljamo se, živimo i radimo. No, tko smo to „mi"? Mi smo pripadnici onih 15% svjetske populacije koji posjedujemo računalo i imamo pristup Internetu. Drugim riječima, šačica *early-adoptera*, *beta-testera* na kojima se tehnologija kali da bi jednog dana možda postala općeprihvaćena.

Inicijative kojima se pokušava premostiti „digitalni jaz" i prodrijeti do preostalih 85% potencijalnih korisnika usko su vezane za manipulaciju komplementima. Prvi potez povukao je 2005. MIT Media Lab predvođen Nicholasom Negropon-

teom, u vidu „Laptopa za sto dolara".[09] Ideja je da hardver financiraju vlade i međunarodne organizacije, dok se za softver brine zajednica slobodnog softvera. I opet, slobodni softver ima ulogu komplementa hardveru i političkoj volji. Godinu dana kasnije, Microsoft nudi platformu FlexGo, prilagođeno PC računalo pokretano verzijom Windowsa, po modelu izvedenom iz mobilne telefonije. Znači: uređaj se daje u pola cijene, a ostatak se naplaćuje kroz cijenu razgovora, odnosno vrijeme upotrebe računala koje se doplaćuje bonovima.

Taj koncept je zapravo prirodni nastavak Microsoftovog tradicionalnog modela poslovanja u kojem se komplement proizvoda, hardver, nastoji učiniti što pristupačnijim, kako bi se softver učinio za korisnika vrednijim a za vlasnika profitabilnijim. U jednoj mogućoj verziji FlexGo scenarija, osnovni hardver bi tako mogao biti besplatan ili skoro besplatan dok se softver uopće neće naplaćivati „na komad", nego će se iznajmljivati. To pak obećava još veće profitne margine nego što je to bio slučaj s korisničkim licencama, ukoliko se doista stekne velik broj novih korisnika – a govorimo o milijardama ljudi koji si ne mogu priuštiti računalo a bonove mogu.

Treba li uopće spomenuti da će FlexGo kompjuteri biti zaključani? Epizodu s Xbox Linuxom stoga je možda najbolje shvatiti kao zagri-

javanje pred veliku bitku za informatizaciju globalnog juga. Iako će Flex-Go kompjuteri biti zaključavani hardverski, čak na razini procesora, pred budućim FlexGo-linuksašima je možda i lakši dio posla. Od prve milijarde ljudi, na pitanje „Želite li platiti vlasnički softver ili besplatno koristiti slobodni bez ikakvih ograničenja" golema većina je optirala za ono prvo, a preostali će dobiti još mnogo bolje ponude od vlasnika softvera.

Između čekića i nakovnja

Gledano iz perspektive novosti, našeg drugog kriterija društvenog uspjeha, posrednički model u poslovanju sa slobodnim softverom tek je uzgredno orijentiran inovacijama. No, problem s ekonomijom inovacije u slobodnom softveru nije tek uzgredan, nego duboko strukturni. U jednoj rečenici, svaka softverska inovacija za koju ulagač ocijeni da mu može donijeti stratešku prednost bit će zatvorena (uopće se neće distribuirati, ili će se distribuirati kao vlasnički softver).

Čini se da iz tog škripca nema izlaza. Najprofitabilniji „maloprodajni" (koji se obraća masovnom tržištu korisnika) poslovni modeli u industriji softvera su distribucija korisničkih licenci vlasničkog softvera i iznajmljivanje resursa. Stoga treba očekivati da će najpoželjniji softver za masovnu upotrebu većinom i

dalje biti neslobodan. S druge strane, inovacije, odnosno istraživanja koja su za njih potrebna, u slobodnom se softveru mogu kapitalizirati jedino kroz komplementarne proizvode i nije jasno kakvom bi se ekonomskom logikom taj problem mogao zaobići.

Jedno moguće, barem djelomično rješenje ponudio je Nicholas Carr u članku *IT nije bitan*[10] i nizu kasnijih publikacija. Iako se Carrovoj argumentaciji može štošta prigovoriti,[11] i prilično je sigurno da teza u najradikalnijoj verziji nije posve održiva, Carr je pronašao jedan mogući put društvenog uspjeha slobodnog softvera.

Glavna Carrova teza je da cijela informacijska tehnologija, dosegavši svoju zrelost, ubrzano gubi stratešku važnost i od kompetitivne postaje infrastrukturna tehnologija. Ako to barem djelomično stoji, to su izvrsne vijesti za slobodni softver. Svoje najveće uspjehe slobodni softver je, naime, redovito doživljavao upravo u domeni mrežnih servisa i protokola, što s prebacivanjem težišta na infrastrukturu dobiva na relativnoj vrijednosti. Drugo i zanimljivije, narav infrastrukturnih inovacija je drukčija od onih kompetitivnih; infrastrukturnim inovacijama ne želi se odskočiti od konkurencije nego se uklopiti u postojeće okvire i proširiti ih na dobrobit sviju. Takav razvoj događaja, iako daje

povoda optimizmu, nažalost nije izgledan u neposrednoj budućnosti.

Za izostanak društvenog uspjeha slobodnog softvera, dakle, postoje ozbiljni ekonomski i socijalni razlozi, kako po kriteriju masovnosti tako i po kriteriju inovativnosti. Glavnu prepreku masovnijem korištenju slobodnog softvera vidimo u neuspjehu zajednice njegovih stvaralaca/korisnika da u svoje redove uključi više informatičkih laika. Na prvi pogled, to izgleda kao začarani krug: korisnika će biti više kad ih bude više, ali nije sasvim tako. Među informatičkim laicima nalaze se stručnjaci na područjima koja su za masovnu informatiku važna, kao što su dizajneri, lingvisti, psiholozi i dru-

gi. No, nužno je da i oni pronađu smisao u upotrebi i stvaranju slobodnog softvera, dakle da osjete da ih zajednica želi i treba. Čini se da se ethos zajednice slobodnog softvera sve više mijenja u tom smjeru pa možemo biti donekle optimistični.

Problem inovacije čini nam se u osnovi nerješiv u postojećim ekonomskim okvirima kompetitivnog tržišta. Ipak, moguće rješenje proizlazi iz promjene okvira u kojem se odvija informatička ekonomija i prebacivanja težišta na infrastrukturu. U tom slučaju, za relativni uspjeh slobodnog softvera u pogledu inovacija najzaslužniji bi bio neuspjeh onog neslobodnog. Koliko će to dobra donijeti u Velikoj shemi svih stvari, teško je reći.

> Ognjen Strpić <

10 Nicholas G. Carr, „IT Doesn't Matter", *Harvard Business Review*, 81(5): 41–49, (2003). V. također http://www.nicholasgcarr.com

11 Suzdržan osvrt na Carra i budućnost IT-a ponudili smo u kolumni „Gnoj i pakao", *Mreža* 9(3): 21 (2006)

40   41

System.hack(6,"zaštita", "Anonimni autor – set za zaštitu CD-a [marker / shift tipka]")

> Hakeri su podijeljeni u dvije skupine po etičkoj osnovi: prva skupina kreira patentne sustave i zaštitne mehanizme, druga ih pokušava zaobići. Dok su prvi usmjereni na korporativno djelovanje, drugi su socijalno angažirani. Otkako su mogućnosti kopiranja koje su donijele digitalne tehnologije stavile izazov pred regulaciju intelektualnog vlasništva, industrija glazbe, filma i zabave učinila je sve kako bi pooštrila zakonske mjere zaštite, uvela tehnološke mjere zaštite i kriminalizirala donedavno legitimno proučavanje i zaobilaženje takvih tehnoloških mjera zaštite intelektualnog vlasništva. Znanje stečeno radoznalošću da se proučavaju tehnološki sustavi kontrole postalo je opasno znanje, a hakeri su pretvoreni u opasne likove koji vladaju znanjima za koje bi državni aparat i kompanije htjele da ih društvo želi provjeriti samo državnom aparatu i kompanijama.

Tema ovog rada su sustavi zaštite od kopiranja i umnažanja CD-ova i DVD-ova, te trivijalne tehnike kojima ih se može zaobići.

Tehnološki sustavi zaštite protiv kopiranja CD/DVD-a mehanizmi su koji priječe korisnicima da umnažaju CD-ove ili DVD-ove. Ti mehanizmi variraju, a tehnološke mjere na kojima počivaju učestalo znaju dovesti do problema i sa samom reprodukcijom sadržaja nosača na uređajima krajnjih korisnika.

Sustavi zaštite protiv kopiranja CD-a koji ovise samo o softveru pokazali su se trivijalnima za onesposobljavanje, a alternativne strategije koje modificiraju format CD podataka neizostavno će izazvati prigovore javnosti zbog nekompatibilnosti s legalnim *playerima*.

Doduše, ranije generacije takvih zaštitnih mjera od kopiranja pokazale su se još trivijalnijima – proslavile su se po lakoći kojom ih se moglo probiti uz pomoć markera.

Sony je 2001. CD-ove opremio Key2Audio sustavom – tehnologijom koja sprečava kopiranje ili konvertiranje pjesama u MP3 datoteke na osobnim računalima. Tehnološke mjere za zaštitu glazbenih diskova poput Cactus Data Shield 100/200 i Key2Audio mogu se probiti upotrebom najjednostavnijih pomagala poput markera i izolacijske trake. Na diskovima vanjski je rub vidljivog dijela audio podataka zaštićen, što onemogućuje kopiranje pa čak i sviranje na računalima. Prekrivanjem vanjskog ruba zaštitu se može probiti i osposobiti disk za normalnu upotrebu na računalima.

SunnComm Technologies je 2003. stvorio zaštitu MediaMax CD3 dizajniranu da spriječi upravo neovlašteno kopiranje audio CD-ova pomoću osobnog računala. Diskovi proizvedeni tom tehnikom sadrže dvije verzije glazbe, svaku zaštićenu na drugačiji način. Jedan set pjesama su audio CD kompozicije koje sviraju na standardnim CD *playerima*, ali na računalima se navodno ne bi trebale moći kopirati. Drugi set su komprimirane i šifrirane Windows Media datoteke koje upotrebljavaju tzv. DRM (*Digital Rights/Restrictions Management*) – tehnološko upravljanje pravima/ograničenjima – kako bi ograničile mogućnosti korištenja.

Ti sistemi zaštite čine CD-ove nekompatibilnima s većinom računala. Iako je to spriječilo kopiranje na mnogim PC konfiguracijama, također je dovelo i do nekompatibilnosti s pojedinim DVD *playerima*, sistemima za video igre i automobilskim CD *playerima*. Savršena kompatibilnost može se postići jedino zadržavanjem standardnog audio CD segmenta diska nezaštićenim, pa stoga MediaMax koristi drugu metodu kako bi spriječila kopiranje na računalima.

John Halderman, student sveučilišta Princeton, nedugo nakon objavljivanja prvog diska sa zaštitom MediaMax CD3 na svojoj je web stranici objavio znanstveni rad s uput-

stvima kako onesposobiti SunnCommovu mjeru zaštite od kopiranja – jednostavnim držanjem *shift* tipke. Ovaj postupak primijenio je na albumu Anthonyja Hamiltona kojeg je izdao BMG.

Pod normalnim okolnostima, kad god bi se pokrenuo Hamiltonov album na računalnom CD čitaču, odmah bi se na *Windows* strojevima podigao anti-piratski softver koji bi spriječavao kopiranje ili konvertiranje u MP3 format. Međutim, držanje *shift* tipke prilikom ubacivanja CD-a sprečava *Windowsov* sustav samopokretanja aplikacija da učita softver za zaštitu od kopiranja i glazbu se može kopirati.

Po objavljivanju znanstvenog rada SunnComm je podigao optužnicu protiv Haldermana, temeljenu na *Digital Millenium Copyright Actu* – Zakonu o autorskom pravu u digitalnom mileniju – kojim je zabranjeno otkrivanje i obznanjivanje načina zaobilaženja tehnoloških mjera zaštite, od koje je doduše uskoro odustao.

Sony je krajem 2005. uveo sustav zaštite CD-a *Extended Copy Protection*. Sustav je na računala korisnika bez upozorenja i dopuštenja instalirao softver koji se lako mogao iskoristiti i za upad u računalo pomoću virusa ili crva. Nakon što je Mark Russinovich na svom blogu obznanio analizu funkcioniranja Sonyevog ilegalnog softvera i upozorio na kršenje prava privatnosti korisnika primjenom DRM-a, pionirska organizacija za zaštitu kiber-prava *Electronic Frontier Foundation* pokrenula je kolektivnu tužbu pred kojom je Sony posustao i ponudio mjere za otklanjanje tog softvera, povukao CD-e sa zaštitom iz prodaje i nagodio se za odštetu.

Najpoznatiji slučaj zaobilaženja zaštite protiv kopiranja DVD-a računalni je program DeCSS kojim je mladi norveški programer Jon Lech Johansen 1999. omogućio da se sadržaj komercijalnih DVD-a, zaštićen *Content-Scrambling Systemom*, može gledati na slobodnim operativnim sustavima kao što su BSD ili GNU/Linux, na kojima se do tada DVD-i nisu mogli gledati. Međutim, da bi omogućio gledanje DVD-ova, DeCSS je morao zaobići tehnološki sustav zaštite čije tajne specifikacije dakako nisu bile dostupne zajednici za slobodni softver. Ubrzo nakon objavljivanja DeCSS koda protiv Johansona tužbu su pokrenuli *DVD Copy Control Association* i *Motion Picture Association of America*. Nakon 5 godina sudskih procesa optužbe su odbačene.

Hakeri se mogu samo slatko nasmijati ;)

> Društvo voli stvarati heroje, baš kao što voli i naći nekoga koga će stigmatizirati i time maknuti fokus s traumatskih polja s kojima se ne može suočiti. Hakeri su kao stvoreni za oboje.

Kada provala u tuđi vojni sistem može poslužiti podizanju nacionalnog ponosa, klinac iz susjedstva (u pravilu) s naočalama brzo dobije svojih petnaest minuta slave. U međuvremenu hakera se treba bojati i kao takve (opasne) ih markirati, jer hakeri znaju i u mogućnosti su kontrolirati i učiniti sve ono što društvo inače dozvoljava samo obavještajnim službama i megakorporacijama. Obavještajne službe i megakorporacije računamo uračunljivim. Mit o hakerima podrazumijeva genije zla i neuračunljivost.

Takve mitove današnja kultura razvija i održava dominantnim instrumentom interpretacije: tržišnom logikom. Tržišna logika podrazumijeva reprezentaciju (*brand*, logo, slogan...), konkurentnost (komparativnu prednost, usporedivost...), materijalni interes kao primarni motiv (profit) i na kraju svedivost na mjeru (broj).

Tržišna logika zadnji je instrument (u nizu) koji bi netko trebao upotrijebiti u analizi i pokušaju razumijevanja hakerske zajednice i kulture. Kako je hakerskoj kulturi zadnji u nizu tik do prvog u suprotnom smjeru, tržišna logika (ipak) može poslužiti kao taj drugi instrument kojem će se u dijalektici i negaciji proučavanog ukazati neuhvatljivost i kompleksnost.

Da bi sveo hakersku kulturu na razumljivu razinu usporedivosti s drugim kulturama koje danas poznajemo, Hollywood i ostatak medijske mašinerije morao je izmisliti 'hakera' koji u trideset sekundi, za koje je vrijeme dodatno uzbuđen felacijom, provaljuje u najčuvanije računalne sisteme ili 'hakera' koji (u Hollywoodu) popularnim zemaljskim prijenosnim računalom i nešto manje popularnim operativnim sustavom provaljuje u računalni sustav vanzemaljaca. U slučaju predstavljanja stvarne povijesti hakerske kulture scenarij je ponovno poznat i uporediv: (zove se) Trijumf Nekolicine. Nekolicine tržišno najuspješnijih. U alternativnijem pristupu Nekolicine egzotičnijih vođa (nečega) ili Nekolicine osuđenih za cyber-kriminal.

Na sličan način na koji tržišna logika nema kapaciteta prikazati neku zajednicu, kulturu (ili u krajn-

jem slučaju proizvod) bez *branda*, manekena i logoa, ona je podkapacitirana i za evaluaciju i analizu kriterija uspjeha iste te zajednice/kulture. Jedan od čestih kriterija vrednovanja hakerske zajednice je i količina inovacija koju ona proizvodi. Taj kriterij naravno podrazumijeva uspoređivanje s nehakerskom, korporativnom kulturom.[01]

Definicija inovacije u svakoj će se diskusiji vrlo brzo pokazati kao direktna derivacija tržišne logike, te će na kraju biti svediva na nekoliko pojmova i brojeva: patentibilnost, broj patenata, *breakthrough*...[02] Jedinstvenost i maksimalno razlikovanje od svega u svojoj okolini preduvjet je prepoznatljivosti i uspjeha na tržištu.

Hakerska kultura, međutim, puno je bliže harmoničnom (ali i izuzetno dinamičnom) ekosustavu u kojem svaki novi organizam ima tendenciju naći svoju poziciju suradnje s okolinom, a jedinstvena funkcionalnost i novost koju organizam donosi ekosustavu neodvojiva je od njegovog kapaciteta suradnje. Čak i u slučaju gotovo očite superiornosti i inovacije, ako rješenje/novi organizam traži radikalnu prekonfiguraciju i repozicioniranje cijelog ekosustava teško da će takvo rješenje naići na odobravanje, prihvaćanje i prilagodbu sustava toj radikalnoj inovaciji.[03]

Kriterij inovacije omeđen i proizveden interpretativnim alatom tržišne logike, a koji prije svega završava u patentnoj potvrdi, gotovo je neprimjenjiv kao kriterij vrednovanja proizvodnje unutar hakerske kulture. Uvjetovana tržišnom logikom inovacija traži jedan vrlo specifičan tip *formatiranja* proizvoda ne bi li se proizvod (na tržištu) prepoznao kao inovativan. Hakerska zajednica puno više proizvodi svima dostupne biblioteke (eng. *library*) nego konačne proizvode za krajnje korisnike, kako u tehničkom tako i u metaforičkom smislu.

Mjera inovacija i inventivnosti hakerske kulture i/ili rezultata suradničkih modela proizvodnje (poput GNU/Linuxa, *BSD-a i drugih) morala bi za početak biti promišljena novim interpretativnim alatima u kojima bi se tržišna logika vjerojatno puno više vezala uz ekonomiju pažnje, ali bi i kao takva činila tek rubni i mali dio kompleksnog sagledavanja inovacija i inventivnosti. Kada bi se maknuli od pritiska tržišne logike i potrebe za stvaranjem jedinstvenih pop zvijezdi u svakom polju ljudske kreativne produkcije, mjere inovacije sadržavale bi i jasne tragove utjecaja i fundamenata svake tzv. 'vrlo nove inovacije', tj. ukazivala bi na kolektivnu prirodu ljudske kreativnosti. U tom smislu hakerska zajednica je najbolji primjer kako ideja kolektivne prirode stvaranja nimalo ne ugrožava jedinstvenost i kreativnost svakog pojedinca (hakera).

Hakerska kultura proizvodi korpus dijeljenog znanja koji za rezultat ima kreativne i inovativne hakere, a njihovi (neupućenom često nevidljivi) inventivni hakovi čine cjelinu (npr. slobodni operativni sustav) moćnijim, kreativnijim i inventivnim, te svojom otvorenošću spremnijim za novu iteraciju inovativnih hakiranja.

Hakerska kultura je za razliku od korporativne kulture (prvenstveno) ekosustav znanja, a ne ekonomski sustav roba. Zbog hibridne prirode slobodnog softvera kao informacijske infrastrukture razvijeni su i poslovni modeli koji slobodni softver tretiraju kao robu, no primarni (suradnički) model produkcije ostaje u domeni proizvodnje i razmjene znanja. Hakerska kultura, kako egzistira u kompleksnom polju razvoja i razmjene znanja, ne poznaje mehanizme tržišta koji se grade na osnovu evidentiranja, proizvodnje i održavanja oskudice.

Preduvjet distribucije i proizvodnje znanja je suradnja, visoka propusnost kolanja u svim smjerovima, te nesmetani, nediskriminatorni pristup resursima znanja. Bolju pojedinačnu poziciju u hakerskoj kulturi tako dobiva onaj koji proizvodi, surađuje i dijeli znanja (nova i stara) s ostalima u zajednici.

Prvi korak u hakerskoj proizvodnji je proizvodnja problema. Konkretno elegantno rješenje kompleksnog problema tek je drugi korak (za koji čak nije nužno ni da se desi). Kompleksnim problemima uvijek se suprotstavlja apstrakcija (metafora). Kompleksne apstrakcije traže rekurzivni pristup apstrahiranju i to tako da se njima suprotstavljaju nove (meta)apstrakcije.

Bilo koji zanimljiv kompleksni sustav koji se iz bilo kojeg razloga opire apstrahiranju hakerska zajednica vrlo brzo će *shakirati* i podvrgnuti daljnjem apstrahiranju, stvaranju i dijeljenju znanja.

Takav tip permanentne refleksije promišljanog stvara kulturu koja se opire bilo kakvoj reprezentaciji, jer u času kad se reprezentacija pojavljuje ona postaje samo novi okidač (kao i fokus) rekurzivne refleksije. Svesti reprezentaciju hakerske kulture na reprezentativna imena je najveći mogući promašaj iz perspektive hakerske kulture. Dosadašnji pokušaji reprezentacije povijesti hakerske kulture u širem kulturnom kontekstu gotovo u pravilu su povijest promašaja tih istih pokušaja.

Bilo što u digitalnoj formi ili samo par koraka od digitalizacije u domeni je igre i apstrahiranja hakerske zajednice. Domenu digitalnog nitko ne poznaje bolje od hakerske zajednice. Informacije i ideje ne mogu biti komodificirane i u privatnom vlasništvu. Mogu biti skrivene, čuvane i šifrirane, no ni taj pristup ne

01 U dijelovima teksta o inovaciji i proizvodnji unutar hakerske kulture, uglavnom ću poistovjetiti hakersku kulturu sa kulturom FLOSS (Free/Libre Open Source Software) pokreta, kao pokreta koji, po mom mišljenju, najbolje predstavlja hakersku kulturu u cjelini. To naravno ne znači da je hakerska kultura svediva na Pokret slobodnog softvera, a posebno ne vrijedi suprotno.

02 U Teslinom muzeju u Beogradu kao ključni izraz Tesline veličine vodiči će uvijek naglasiti broj patenata, a riječ inovacija (gotovo) uopće neće spomenuti.

03 Najbolji primjer takve novine je trnoviti put prihvaćanja Reiser4 datotečnog sustava u Linux jezgru (eng. *kernel*).

može za njih (ideje i informacije) osigurati vječni veo tame.

Upravo ovaj moment pobjede hakerskog duha nad interesima (državne) kontrole i (korporativnog) profita pokreće stvaranje mita o opasnim hakerima koji su u stanju razrušiti svijet (koji poznajemo). Udruženi, država i kapital, napraviti će sve što je u njihovoj moći ne bi li proizveli što više straha, neizvjesnosti i sumnje[04] oko rušenja svijeta koji poznajemo. Daljnje održavanje *status quo-a*, na veliku žalost korporacija, ne mogu osigurati restrikcije 'inventivnih' DRM (*Digital Rights (sic!) Management*) patenata, pa je država uskočila u pomoć zakonskim regulativama poput DMCA i/ili protuterorističkim zakonima.

Država je ugrožena najširom razmjenom kompleksnih znanja o (komunikacijskim) tehnologijama ekskluzivni pristup kojima joj je u prošlosti osiguravao neupitno i stabilno mjesto nadgledanja, kontrole i moći. Korporacije su ugrožene nedostatkom inventivnosti u pronalaženju novih poslovnih modela, a koji se ne zasnivaju na eksploataciji pozicije kreativnih proizvođača i nemogućnosti krajnjih korisnika da međusobno podijele proizvode zabave i interesa. Stari poslovni modeli, izgrađeni na nekoć inventivnoj tehnologiji, desetljećima su, u suradnji s državom, blokirali prodor novih inven-

tivnih tehnologija. Današnjih dana sve višu siju strah i paniku.

Nesnalaženje giganata kreativne industrije (zabave) u novonastaloj konstelaciji tehnologije i (hakerske) kulture primat inventivne profitabilne industrije danas prepušta *spam* i *porno* industriji. Hakeri se na to mogu samo slatko nasmijati ;)

Apsolutna mobilnost digitalnih informacija, s tendencijom pada troškova svake nove kopije prema nuli, ima nesagledive prednosti za cjelokupnu ljudsku kulturu. Tih prednosti su danas svjesni svi (barem 90% korisnika računala) koji su ikad uz par klikova mišem imali pristup ogromnoj količini digitaliziranih dostignuća ljudske intelektualne produkcije.

Država i tržišna logika globalno harmoniziranom restriktivnom zakonskom regulativom nerazumijevanja (ne više tako novog) digitalnog svijeta šizofreno stavlja u poziciju kriminalaca sve one koji su se uvjerili u nesaglédivost prednosti hakerske kulture. Srećom da protiv njenih inovativnih patentnih Golijata postoje hakovi zajednice anonimnih, Hollywoodu neatraktivnih heroja, koji posezanjem za vodootpornim flomasterom ili *shift* tipkom tu cijelu farsu čine ridikuloznom i zabavnom.

> Marcell Mars <

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04 **Poznata agresivna marketinška strategija IBM-a iz 70-ih u kojoj je fokus poruke javnosti na proizvodnji straha, neizvjesnosti i sumnje (kratica FUD) o konkurentnom proizvodu (umjesto pokušaja da se svoj vlastiti proizvod prikaže boljim od drugih). Također marketinška strategija koju je Microsoft intenzivno primijenjivao krajem 90-ih i početkom 00-ih u borbi protiv FLOSS-a (*Free/Libre Open Source Software*).**

System.hack(1, "broadcasting","Orson Welles – War of the Worlds")*

> The ability to confuse audiences en masse may have first become obvious as a result of one of the most infamous mistakes in history. It happened on the eve of Halloween, on Oct. 30, 1938, when millions of Americans tuned in to a popular radio program *Mercury Theatre on the Air* that featured radio plays directed by, and often starring, Orson Welles. The performance that evening was an adaptation of the science fiction novel, H. G. Wells's *The War of the Worlds*, about a Martian invasion of the earth. But in adapting the book for a radio play, Welles made an important innovation: under his direction the play was written and performed so it would sound like a live newscast reporting an invasion from Mars, a technique that, presumably, was intended to heighten the dramatic effect. Approximately one-half of the 50-minute play was a contemporary retelling of the events of the novel, presented in documentary style. This approach to radio drama had never been attempted before (at least not with as much continued verisimilitude), and the innovative format has been cited as a key factor in the confusion that would ensue.

The program, broadcast from the 20th floor at 485 Madison Avenue, New York, started with a short introduction to the intentions of the

aliens, and noted that the adaptation was set in 1939. The program continued as an apparently ordinary music show, only occasionally interrupted by news flashes. Initially, the news was of strange explosions sighted on Mars. The news reports grew more frequent and increasingly ominous after a "meteorite" – later revealed as a Martian rocket capsule – lands in New Jersey. A crowd gathers at the landing site, and the events are related by reporter Carl Philips up until the Martians incinerate curious onlookers with their heat rays. Later surveys indicate that many listeners heard only this portion of the show before contacting neighbors or family to inquire about the broadcast. Many of these people contacted others, in turn; leading to rumours and later confusion.

Martian ships land, and then proceed to wreak havoc throughout the United States, destroying bridges and railroads, and spraying a poison gas into the air. An unnamed Secretary of the Interior advises the nation on the growing conflict. (The Secretary was originally intended to be a portrayal of then-President Franklin Delano Roosevelt, but CBS insisted this detail, among others, be changed. The "Secretary" did, however, end up sounding very much like Roosevelt as the result of directions given to actor Kenny Delmar by Welles. Military forces attack the Martians, but are unable to fight them off.

After the live reporting of the events, the story breaks and continues as a narration of the survivor scientist recording in his diary the aftermath of the devastation and the conclusion of the story (whish ends in the same way as the novel), with the Martians falling victim to earthly germs and bacteria. Following the conclusion of the play, Welles breaks character to remind listeners that the play was only a Halloween concoction, the equivalent of dressing up in a sheet and saying "Boo" like a ghost; reportedly, this "disclaimer" was added to the broadcast at the insistence of CBS executives as they became aware of the panic inspired by the program.

Many people missed or ignored the opening credits of the program, and in the atmosphere of growing tension and anxiety in the days leading up to World War II, took it to be an actual news broadcast. Contemporary newspapers reported on the panic that ensued, with people fleeing the area, and others thinking they could smell the poison gas or could see the flashes of the fighting in the distance. Later studies suggested this "panic" was far less widespread than newspaper accounts suggested. However, it remains clear that many people were caught up – to one degree or another – in the confusion that followed.

In the aftermath of the reported 'panic', a public outcry arose, but CBS informed officials that listeners were reminded throughout the broadcast that it was only a performance. Welles and the *Mercury Theatre* escaped punishment, but not censure, and CBS had to promise never again to use the 'we interrupt this program' prompt for dramatic purposes.

A study by the Radio Project discovered that most of the people who panicked assumed Germans – not Martians – had invaded. Other studies have suggested that the extent of the panic was exaggerated by contemporary media.

It has been suggested in recent years that the *War of the Worlds* broadcast was actually a psychological warfare experiment. In the 1999 documentary, *Masters of the Universe: The Secret Birth of the Federal Reserve*, writer Daniel Hopsicker claims that the Rockefeller Foundation actually funded the broadcast, studied the ensuing panic, and compiled a report that was only available to a chosen few.

The biography of Orson Welles reveals amusing performances he put on in his television show *Orson's Bag*. He would transform himself into Winston Churchill, or would mimic the characters from *Moby Dick*, hosting the Muppets, Burt Reynolds, Angie Dickinson. Welles's never filmed, never finished, never shown film projects spawn throughout his career. *The Citizen Kane* is a film apart – significant not only in the context of cinema, but also in the context of cultural history. The significance of Welles and of all that is associated with him cannot, whatever one might think, be imagined without a tone of grandeur, of epic character of it all. This giant figure with the cartoon voice capable of subtle interpretation has delivered many memorable film performances. Spirited, prone to musing and utopian plans, he conceived the radio drama *The War of the Worlds*, which to day present is subject to research and theoretical analyses – this first and arguably greatest media hoax ever.

The Rise and Fall of Mediatized Reality in the Age of Radio

52 > We know now that in the early years of the twentieth century a mass medium different from all precedent was conquering the world. Radio. The medium that ushered in the age of broadcasting media, the medium of voice, will however remain not only different from the precedent medium of writing, but also from the antecedent medium of image. And the age of the medium of voice will remain not only different from the age of the medium of the written word, but also from the age of the medium of the image.

In those early decades of the twentieth century a socio-political organization of modern societies started to form, based on a unitary political public sphere integrated through media of synchronous reception and the rise of the middle class as forerunner of the consumer society of the latter part of the century. And it is in this process of formation of the public through mediatized reality and consumer society that the radio will play a crucial role.

It is true that the modern political public sphere already begins to constitute in the written word culture of the early bourgeoisie. The newspapers create a public that has a unified sense of remote events as events taking place in their common time and space – indeed, it was only with this first mass medium that a common space and time of modern polity came about in the first place. However, because of the relatively asynchronous way of reception of newspaper reporting and social limitations to literacy, a potential for a complete integration of public sphere would not come about before the onset of radio broadcasting.

Radio broadcasting will thus inaugurate a new political ontology based on a number of qualities introduced by the new medium:

First, the real-time transmission – i.e. the coincidence of emitting and collective reception of a message. With this potential for immediate reception of the undelayed reporting on recent events – i.e. news reporting – will become a politically formative characteristic of the radio age.

Second, the liveness of events in their transposition by media. Under the condition of transmission in real-time, the liveness will allow listeners to participate in the events regardless of their physical absence. They will become part of the events of their time and age as much as the immediate actors, and the reception will attain a particular form of participation – affective mobilization.

Third, the synchronous act reception between remote listeners, which could not have been the case between remote readers. The radio was after all a medium of ephemeral passing of the message, and not its fixation as the newspaper was.

Fourth, the telesthetic contraction and homogenization of space into a unitary space of events. Synchronous reception and telesthetic homogenization of space will create a unified space and time of events for the big political community – nation.

Fifth, the domination of voice as the authentic statement and guarantee of the speaker's actual presence in his physical absence. This potential of the voice in the radio age will create, for instance, a whole new genre of political speech – address to the nation, where the address by a political authority serves the immediate affective mobilization of the general political community as a unitary subject.

Sixth, the intrusion of public speech into the listeners' private space, family space of gathering around the radio receiver, will create a new kind of interlock between the public and private sphere, thereby initiating a completely new formation of legitimating the public through the private. The transformation of the social form of reception* worked in turn to also transform the demographic structure of legitimation, including into the common space and time of unitary political event those parts of the population who were previously excluded – illiterate, minors, women, elderly, etc. – all those who were huddling around the family's radio receiver – creating thereby a wide concept of public opinion we are used to today when speaking about polls among public on the results of which the governance of today is so dependent.

The increasing legitimational importance of public opinion, which began to include the preferences of those who weren't previously asked for their political opinion, was additionally favored by, seventh, a transformation of the social structure of reception. The radio age would become marked by the incipient formation of the middle class on its way of becoming a dominant class of consumerist welfare societies. Indeed, the radio itself began its career as a consumer product – after all, the first radio programs were mostly non-commercial, where the broadcast program primarily served as a tool for department

53

* Although the social form of reception is an aspect often ignored in media theory, since Benjamin it is the shift in the social form occurring in a transition between two media that is a genuine auratic moment where political masses emerge – mass media aura as Sam Weber has called it. Accordingly, the collective experience of watching a film in a cinema theater is aesthetically just as significant as the experience of shock introduced by cinematographic editing.

stores to persuade buyers into purchasing radio receivers or as a tool for large newspaper publishing houses to attract readers.

Almost three decades after the first radio program in 1909, on October 30, 1938, on the "eve" of World War II, the *CBS* and *Mercury Theater on the Air* aired as their Halloween special Orson Welles's radio adaptation of H. G. Wells's *The War of the Worlds*. As is well known, Welles's fake live reporting of the Martian invasion of the planet Earth scared masses of frightened listeners, who tuned in late only to confuse the fiction for reality, into fleeing their homes before the onslaught of Marian troops.

In this most famous of all media hoaxes, Welles made use of a shift that has come to pass between media and their referential reality in the radio age, which remained mostly unnoticed until then. He had managed to connect the potential for simulating factuality of fictional events by means of skillful editing of live transmission, interrupting news flashes, live reporting, addresses to the public, with the power of affective mobilization offered by the suggestive medium of sound and voice. He had managed to connect a real threat of the coming war with the fear before the alien as represented by the extraterrestrial invasion. For instance, the Secretary of Internal Affairs appearing in the radio dramatization was intentionally made to sound like the US president at the time Franklin Delano Roosevelt, while many listeners panicked only after confusing the word "Germans" for the word "Martians".

What *The War of the Worlds* made apparent was that the broadcasting media had made the contemporary political event a fluid category: affectively colored world of the politics of fear. The transmission in real-time transformed into a general political community in real-time, a space of global mobilization of nations.

The realization that all political reality is a mediatized reality that has become general knowledge through this hoax, brings, however, a very uncertain gain, as it is wrought by an internal paradox. That is, although we are aware that the mediatization, mediatic mediation, makes this reality hackable, we over and over fail to recognize the simulation. The reason is: the more a medium becomes true to reality, the reality itself becomes less true. And this insight into the increasingly trustworthy simulation of increasingly untrustworthy reality, emphasized also in Orson Welles's concluding words: "we have annihilated the world before your ears", after its emergence in the age of radio, will become total come the age of televised image.

> Tomislav Medak <

System.hack(2, "telecom", "Captain Crunch – whistle")*

> John T. Draper's life is a frenzied one, with situations taken straight from a novel full of kafkian atmosphere. He's more known as Captain Crunch, after a whistle from the cereal box. A blind friend named Joe Engressia informed him that a toy whistle that was, at the time, packaged in boxes of Cap'n Crunch cereal, could be easily modified to emit a tone at precisely 2600 hertz – the same frequency that was used by AT&T long lines to indicate that a trunk line was ready and available to route a new call. This would effectively disconnect one end of the trunk, allowing the still connected side to enter an operator mode. Experimenting with this whistle inspired Draper to build blue boxes: electronic devices capable of reproducing other tones used by the phone company.

Draper was arrested three time on various wire fraud charges. Convicted on toll fraud charges in 1972, he was sentenced to five years' probation. In the mid 1970s he taught his phone phreaking skills to Steve Jobs and Steve Wozniak, who later founded Apple Computer. He was briefly employed at Apple, where he created a telephone interface board for the Apple II personal computer. The board was never marketed, however, partially due to

54

Draper's arrest and conviction for wire fraud in 1977. He served his four-month sentence at the Federal Correctional Institution, Lompoc, California, where he wrote *EasyWriter*, the first word processor for the Apple II.

"While serving time in minimum security prison I held Phone hacker classes, and taught everyone who was interested how to do anything they wanted with a phone. It was made clear to me what would happen if I refused to provide this tutoring service. Another thing that was made especially clear to me was to avoid being a "Snitch". So, to survive the system, I was forced to offer classes on certain technology."

The class of vulnerabities Draper and others discovered was limited to call routing switches that employed in-band signaling, whereas newer equipment relies almost exclusively on out-of-band signaling, the use of separate circuits to transmit voice and signals. The Captain Crunch cereal whistle could blow 2600Hz note and seize a phone line. The blue box then took over with it's dual frequency combinations known as 'multfrequency' or MF, similar to touch tone frequencies. Some phone systems worked on SF, or Single Frequency.

The 2600 Hz Captain Crunch whistle could make the entire call. One long whistle to seize the line, a short one for a "1", two short ones for a "2", etc. The blind phone phreak, Joe Engressia, could dial an entire call just by whistling it out of his own mouth.

"Once I discovered the new frontiers that blue boxes afforded me, I was able to explore a whole new relm of numbers. These numbers were inter-city dial codes that operators from one city would use to reach operators in another. These were called routing codes, which are no longer used, but during the times I was experimenting, I was able to find out all sorts of internal numbers."

Draper picked up a public phone, then proceeded to "phreak" his call around the world. At no charge, he routed a call through different phone "servers" in countries such as Japan, Russia and England. Once he had set the call to go through tens of countries, he dialed the number of the public phone next to him. A few minutes later, the phone next to him rang. Draper spoke into the first phone, and, after quite a few seconds, he heard his own voice very faintly on the other phone.

As the story of his experiments spread and got into newspapers, it also reached the authorities, leading to the investigation that exposed his accomplices and to Draper's prosecution. The experiments with the whistle and blue box lead to huge material expenses of sustaining the unbilled phone calls, the redesign of the line protocols and the accelerated equipment replacement. Though they could no longer serve practical use, the Cap'n Crunch whistles did become valued collector's items.

Breakfast Cereal and In-Band Signaling

58 > For the last fifty years, breakfast cereal companies have included little prizes, called "premiums" at the bottom of their boxes of toasted and sugared corn and oats. The "prize," as it is frequently referred to by children, is most often a small plastic toy emblazoned with the name or logo of the cereal company. These premiums are universally cheap and flimsy. For a child, finding the toy in his or her bowl, and finding out what it is this time, is almost always more exciting than actually playing with it.

Perhaps the most famous premium in the history of cereal – certainly the most famous premium in hacker communities – is an otherwise unnotable whistle found at the bottom of boxes of *Cap'n Crunch* cereal in in the 1960s. To most non-hackers, the whistle was just an ordinary plastic whistle – the vast majority were put aside and tossed away when children grew tired of them. Like all whistles, one blows into it and it makes a high-pitched noise. Like many other whistles, if one covers one of the output holes, the tone of the whistle raises in pitch. The tone, with one of the holes covered, was the E above Mid-

dle C – in scientific terminology, the sound created by vibrations of air in a sine wave with a frequency of 2600Hz. To understand why a whistle that makes this tone is so significant to hackers requires both a little more technical explanation and a little more history.

In the middle of the twentieth century, the US phone system worked with what is called "in-band signaling." Basically, this means that information about the phone connection itself is transmitted as audio data over the phone line. In other words, AT&T phone hardware used signals audible to humans (i.e., noises or tones) to signal all of the routing and connection data used by the system to communicate the status of a given call or line and to coordinate actions accordingly. Phone numbers when you type them today continue to make different audible beeps – this is what allows you to play songs by pressing numbers on the phone. But in addition to just dialing numbers, AT&T needed a way to recognize if a line was in use. No signal at all may seem like an ideal way to represent an empty line but it might merely indicate a pause in a voice connection or

a conversation placed on mute. Instead, AT&T chose to place a steady tone of the E above Middle C – 2600Hz – on all unused and available lines to signal to the rest of the system that the line was free. You can think of it like a dial tone that only exists when every phone is hung up. It's not something that a human being should ever hear and it's certainly not something that any human being was ever supposed to make.

At first, the use of 2600Hz was the proprietary knowledge of AT&T engineers. With time, with publications, and with a number of happy accidents, many people learned the about the 2600Hz tone. Hackers – or more precisely, the 'grandfathers' of modern hackers known as "phreakers" (a combination of the terms freak, phone, and hacker) – discovered 2600Hz. It's not clear who in the phreaker community "discovered" the possibilities of using 2600Hz to explore the system but hacker lore places the credit with Joe Engressia.

Engressia was born blind, was blessed with perfect pitch, and spent much of his adolescence and young adulthood on the telephone. Sometimes, he whistled while he listened to or made phone recordings. Legend says that at eight years old, Engressia found out that by whistling 2600Hz, he would be 'disconnected' from phone lines (in fact, they would just go silent). With time, and with exploration of the phone system, he discovered out exactly why.

If the caller on the Bell/AT&T network placed a long distance telephone call to, for example, a toll-free, long distance, 1-800 number – or anything over fifty miles away – the phone call would be routed over a long distance line or "trunk." By playing the 2600Hz tone, the trunk would become convinced that the caller has hung up and that it should 59 wait for someone else to take it over. The trunk would quickly go off-hook and then back on-hook in what is known as a "supervision flash." It would make a short clicking noise following by silence. This click and silence was the sound of one end of the trunk signalling to the other end – presumably another part of the phone system – that it is waiting for routing digits. By following up with another tone known as a "key pulse" and then with a set of digits (either a phone number or an internal phone company code) the caller who had played the 2600Hz tone could then make long-distance or internal phone company phone calls *from* the trunk line. They could call for free.

By the mid-sixties, Engressia had discovered all of this and much more. In this way, Engressia happily spent years whistling his way to both free phone calls and to a deep understanding of the ins and outs of the US and early global phone systems – to a degree that surpassed even most Bell Engineers. And by no means was Engressia alone. Of course, many hackers without perfect pitch had to resort to more technical means to

create 2600Hz tones. It was with this fact in mind that Engressia called his friend John Draper to tell him about the interesting property of the whistle he had found in a box of Cap'n Crunch cereal.

Not only did Draper use the whistle to make free phone calls, he used it as his hacker namesake and, to this day, is more widely known in the hacking and phreaking communities as "Captain Crunch". Over time Draper made phreaking easier and the technology more accessible by building the 2600Hz tone, and other useful tones for those interested in exploring the phone company's network or in making free long distance phone calls, into pieces of specialized hardware known as "blue boxes" – named so because the first such box confiscated by Bell Systems security was found in a blue plastic case and not because all, or even most, were blue.

Captain Crunch was arrested on phone-related fraud charges in 1972 and sentenced to five years probation. At some point in the mid-1970s, he taught Apple Computer founders Steve Jobs and Steve Wozniak to make and sell their own blue boxes. He ran into trouble with the law again in 1977 for wire-fraud and served four months in jail. Upon release, he continued life as a software programmer writing the first word processor for the Apple II. By the early eighties, the technology that

ran the phone system was in an expensive and extensive state of flux, in part to block the techniques created and propagated by Captain Crunch. More importantly to Draper though, personal computer technology had begun to open the door to a whole new world – the world of computers, software, and networks – the world where phreakers would quickly become hackers.

Today, phone switching in all Western Nations and in most of the rest of the world has become digital and uses out-of-band signalling. The captain crunch whistle and blue boxes have not 'worked' for decades. In an interesting turn of events over the last several years, Voice over IP (VoIP) technologies, combined with increasingly widespread broadband Internet connections, have allowed hackers to return to their roots by striving for and achieving the original phreaker goal of free phone calls.

New York-based *2600 Magazine* bills itself as "The Hacker Quarterly." It remains one of the longest running institutions of hackers who are willing to challenge security systems and to explore. Local 2600 meetings around the globe provide an important venue for hackers, young and old, to share expertise, to learn, and to socialize. The name, of course, is a now often-forgotten reference to the famous frequency and to one of the most famous hacks of all time.

> Benjamin Mako Hill <

System.hack(3,"copyright law","Richard Stallman – GNU GPL")

> Richard Stallman, the founder of the free software movement, spent a number of years working at the MIT Artificial Intelligence Laboratory. Following the development of computer programing and seeing the shortcomings and ethical dilemmas that came with the rise of proprietary software, he set out to create an alternative system to avoid them – free software. In January 1984 he left his job at MIT and began working on a free operating system. The work on GNU Emacs began in September 1984, and already at the beginning of 1985, the system was already usabe. By 1990, the GNU operating system was practically complete; its only missing component was the kernel. Initially, the GNU HURD kernel was to be used, based on the Mach micro-kernel. As the development of the GNU HURD was behind schedule, the GNU operating system development stalled until another available kernel appeared. In 1991, Linus Torvalds developed the Unix compatible kernel and named it Linux. The combination of Linux with the GNU system resulted in an integral free operating system. Due to Linux today we can use the GNU operating system, called the GNU/Linux.

The GNU free software is comprised of programs published under conditions that allow anyone to study, modify

and share it with their friends. The advantage of GNU software is its ethical component, enabling the users to collaborate while respecting their freedom. To achieve this in an environment where software is protected under copyright and at a time when that copyright were beginning to be enforced in order to transform the software into a private property and a computer market commodity, it was necessary to find a way to use the legal framework of copyright to prevent GNU becoming private property. The method Richard Stallman resorted to came to be known as copyleft. The essence of copyright law is in it power to exclude. The copyright owner has the legal power to forbid others to copy, distribute and modify the work. Copyleft is based on copyright, but working in opposing direction: instead of privatizing software, it enables it to preserve its freedoms. The main idea behind copyleft is allowing each user the right to freely use, copy, modify and distribute altered versions of the software, as long as she doesn't restrict in any way the freedoms of other users, but enables them to share it, in original or modified form, under the same conditions. For GNU software, the means of transforming the copyright, a tool of privatization, into a tool of sharing – copyleft – is the GNU General Public License, or GNU GPL.

As The Free Software Definition states (http://www.gnu.org/philosophy/free-sw.html): "'Free software' is a matter of liberty, not price. To understand the concept, you should think of 'free' as in 'free speech,' not as in 'free beer.'

Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it refers to four kinds of freedom, for the users of the software:

— The freedom to run the program, for any purpose (freedom ø).
— The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.
— The freedom to redistribute copies so you can help your neighbor (freedom 2).
— The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this."

In the GNU project, we use "copyleft" to protect these freedoms legally for everyone. But non-copylefted free software also exists. It is precisely this feature that has allowed the free software to harness the creative power of thousands of developers world wide, allowing them to jointly work on the development of free software without having to fear that their effort will be appropriated or used as a base for new development without that progress feeding back into the further development of free software.

Richard Matthew Stallman is the founder of the free software movement, the GNU Project, and the Free Software Foundation. His major accomplishments include Emacs (and the later GNU Emacs), the GNU C Compiler, and the GNU Debugger. He is also the author of the GNU General Public License (GNU GPL or GPL), the most widely-used free software license, which pioneered the concept of the copyleft. Since the mid-1990s, Stallman has spent most of his time as a political campaigner, advocating free software and campaigning against software idea patents and expansions of copyright law.

Richard Stallman – Hacking Property

64 > Richard Stallman is the archetypal hacker, who discovered, through his own practice in computer science, the nexus between information and property as it confronts all hackers – in the broadest sense – today. The challenge of Stallman's work is to connect these diverse hacker practices. For Stallman, hacking means exploring the limits of what is possible. After an exemplary career in hacking software, Stallman turned to hacking the politics of information.

The Free Software movement that he initiated challenges the notion that copyright is a natural right. He uses copyright law against itself, as it were, as the instrument for creating an enforceable freedom, rather than an enforceable unfreedom. Stallman's General Public License insists not only that what is released under the license may be shared, but that modified versions that incorporate material issued under this license must also be free.

While Stallman repeatedly states that he is not against business, he stakes out a quite different understanding of an economy of information. For Stallman, the artificial scarcity created by hoarding informa-

tion in unethical. If he likes something, he wants to share it. Free software is based in the social advantage of cooperation and the ethical advantage of respecting the user's freedom. It is explicitly a step towards a post-scarcity world. He sees free software as a practical idealism that spreads freedom and cooperation.

Stallman distinguishes Free Software from open source. Open Source is a development methodology; Free Software is a social movement – a social hack. Stallman complements his practical efforts to spread free software under the General Public License with a critique of what has become of the copyright system. Stallman insists that in the United States copyright began not a natural right but an artificial monopoly – originally for a limited time. Copyright provides benefits to publishers and authors, not for their own sake, but for the common good. It was supposed to be an incentive to writing and publishing more.

However, writers usually cede rights to publishers in order to get published. Writers usually do not own the means of production and distribution to realize the value of their works, and so they lose control

over the product of their labor. As publishers accumulate wealth in the form of exploitable copyrights, the legitimation of copyright shifts from the common interest of a community of readers to a 'balance' of interests between writers and readers. Or rather, between readers and publishers. Where copyright licensed temporary monopolies in the interests of the common good, the emerging regime of 'intellectual property' rights protects the interests of publishers as an interest in and of itself. Perhaps indeed as a new kind of class interest – of what I have elsewhere called a 'vectoralist class', a class which uses intellectual property law as a means of controlling the production process through the ownership of information as private property.

The consolidation of the intellectual property as something close to an absolute private property right is the sign that a new class interest is forming. Intellectual property is not a continuity but a break with the old legal forms. What had to be justified under copyright was the artificial monopoly; what has to be justified under intellectual property is the common interest. What, in any case, is being 'balanced'? The reader's freedom to do whatever she or he wants with information, or the reader's interest in the production of more of it? Under the intellectual property regime, only the latter is a 'right', not the former. The reader's right is the right to purchase intellectual property.

Even if we accept the questionable assumption that intellectual property maximizes production, what it maximizes is the production of unfreedom. Having lost the right to plagiarize and co-opt and modify works as their please, readers find their only right is to purchase works from publishers. Publishers – the vectoral class – then claims that anything that takes away its sales is 'piracy'. As the punk princess herself, Courtney Love once said, it is the record companies that are the pirates – authors find themselves no better off than readers (or listeners or viewers). They confront a vectoralist class that now claims its rights are paramount. The public good is to be measured by the margins of the vectoralist industries and by nothing else.

Having secured its interests thus far, the vectoralist class then argues for complete enclosure within property of every aspect of information. They want to encrypt information however they want and have the state impose criminal sanctions for anyone else who breaches this now absolute private property right. Patents, as Stallman points out, function very differently to copyrights, and yet the end result is the same – the securing of information as property that has equivalent value on the abstract terrain of commodification.

Unlike copyrights, patents are not automatic but have to be applied for, producing a time consuming lottery for hackers who sometimes **65**

never know who holds a patent on what. This is less of a burden for the vectoralist class. Vectoral businesses accumulate portfolios of patents and cross license to each other, enhancing each other's quasi-monopoly position. The result of the enclosure of information within property is not a scarcity of innovation, but a scarcity of cooperation.

66   As Stallman wryly points out, during the cold war the USSR and USA both controlled information, but under different regimes. The USSR controlled information for political reasons, producing an economic disaster. The USA that emerged out of the cold war controls information for economic reasons – and the result is a political disaster. What is

produced under the combined weight of patent and copyright is merely the extension of commodification itself.

This is the context in which Stallman's General Public License can be understood as a genuine social hack. It is a hack in the aesthetic senses of the word, in that it uses the materials to hand. It uses the law of property against itself, as a way of protecting some small space of free cooperation. It is not a program or a manifesto but an application. Stallman extends the hacker aesthetic beyond the world of programming into the social realm, but practices hacking in this new and larger terrain in much the same way. This is his genius.

> McKenzie Wark <

System.hack(4,"biota", "Heath Bunting – SuperWeed Kit 1.0")*

> Big corporations increasingly decide over and profit on vast dominions of human existence. Formerly common things such as land, water, and air are being monopolised. Food is being polluted by GMOs introduced without any public knowledge.

Genes control the chemical messages within cells, they determine the form and functioning of the cell, the organism's various organs, and the whole organism. These codes of life consist of four chemical building blocks, arranged in pairs, like the treads of a spiral staircase. Millions of different combinations of the basic chemicals determine the different genetic make up of each kind of organism.

Genetic engineering is a set of techniques and processes for altering these genetic codes. Our friends like Monsanto have a tendency to concentrate a lot on engineering seeds which incorporate both pesticides and herbicides, or seeds which make plants more resistant to pesticides so you can spray lots more on.

Aside from the actual technology of genetic copy protection, corporations are nevertheless vigorously enforcing their intelectual property rights over genetic code, even when they pollute the crops of farmers not using their seeds.

*   Based on a press release announcing the project presentation at the ICA in 1999.

The traditional means of protesting through street manifestations and via formal channels seem inadequate for invoking changes in the present dangerous and undemocratic situation.

Cultural terrorism can be defined as an attack against the dominant systems of power and their attempt to define reality and nature. In 1999, Michael Boorman of Natural Reality launched the 'Natural Reality SuperWeed Kit 1.0 – a DIY kit capable of producing a genetically mutant superweed, designed to attack corporate monoculture'. Heath Bunting and Rachel Baker are founders of The Cultural Terrorist Agency, that has financed SuperWeed Kit 1.0

Michael Boorman of Natural Reality said "Genetic hacker technology gives us the means to oppose this unsafe, unnecessary and unnatural technology. To quote Heath Bunting of irational.org: "Biotechnology is not only the next battleground on which the control of life and land is fought, but also on which life itself is redefined. It is essential that the concepts of property and representation in this arena are seriously challenged."

The kit supposedly contains a mixture of naturally occurring and genetically mutated seeds of Brassica seeds (e.g. Oilseed Rape, Wild Radish, Yellow Mustard, Shepard's Purse), which, if allowed to germinate and cross pollinate, would create a SuperWeed resistant to current herbicides, potentially threatening the profitability of GM crops, but also of herbicide production and distribution as well.

Steve Kurtz of the Critical Art Ensemble terms the Irational.org approach "biological civil disobedience." Such a new method of protest is "not well theorized or strategized," he writes. "Playing with reproductive systems, ecosystems, and germ lines is a pretty high gamble." Kurtz says his group is open to this type of action, but is still assessing the impact and ethics. The members are now making a bacteria-release machine. "It has similar potential, but in the end, like the SuperWeed, it's more spectacle than substance," he says. "While there is a possibility of disaster, the probability is exceptionally low."

Heath Bunting, is a British artist and well known internet hacker activist responsible for information subversion campaigns against organisations such as Glaxo, Nike and 7-Eleven stores. He lives in Bristol, Great Britain. Internationlly he's recognized as one of the pioneers of net.art. He has exhibited all over the world with projects including graphity, performance, intervention, pirate radio and other forms. At some poing he ventured into the field of genetics proclaiming it to be the next "new media". 'Natural Reality Superweed kit 1.0' is an important contribution to an artistic practice that is opening a new creative field between science and art. He is a founder and member of irational.org collective. His main ambition is to find a way to give it all up and live outside as god intended.

SuperWeed – An Art project by Heath Bunting

http://www.irational.org/cta/superweed/

> A two-letter prefix is beginning to crop up in conversations about food. "G.M. food" or *genetically modified* food has become a standard ingredient in most processed products on the market. From snack foods like potato chips to candy to other packaged foods, "75 percent of food bought in America [and other countries] has genetically altered ingredients, [with most of] the alterations not listed on labels."[01] Because of this inconsistency in labeling across many products, it has become unclear what contains G.M. crops or not. "Nearly every product with a corn or soy ingredient, and some containing canola or cottonseed oil, has a GM element, according to the grocery-manufacturers group."[02] Although this is quickly becoming a reality, there are still many questions about the crops and their effect on consumer's health.

Despite public confusion on what crops may contain the modifications, arguments for and against GM crops are building. The arguments for the crops are based on the global population increase and the increased need for food. Since there is difficulty imagining cultivating more land than we are currently using, the need to yield more per acre becomes important. GM crops allow for this yield to increase for the following reasons: 1) The crops cut down on pest infestation, which ultimately increases the harvest, 2.) The crops produce more of their yield than traditional crops, 3.) No need to apply pesticides since the plants are more resistant to pests. Arguments against the plants range from confusion over the resulting health consequences of consuming the modified crops to uncertainty of their origins; however there is no evidence they are harmful to humans. In addition, public consumption of GM crops is already at a high level with most processed food, particularly staples such as sugar and flour.

As knowledge about GM crops begins to circulate, there has been global protest against the foods. In May 2000, a protest in Genoa, Italy at a local McDonalds[03] resulted in the multi-national corporation halting its purchasing of GM ingredients. Recently a study of laboratory rats fed GM crops found that the animals developed organ abnormalities and changes in their blood profile.[04] This has led to the widespread ban of G.M. crops in India. As information surrounding results like these proliferate around the globe, the resistance to accepting G.M, crops into everyday subsistence is growing. The unknown fear of what else might occur as a side effect of consuming the products has taken over their potential as an answer to the global food crisis.

Responding to the concern over G.M. foods, U.K. based artist, Heath Bunting's work, "SuperWeed", addresses the threat of the crops once they enter the food chain by illustrating the crop's influence on their immediate surroundings. Bunting initially monitored several G.M. crop related mailing lists to find out what was important to people about the rise of GM use. Bunting explains how he began the project, "I wanted to make a bio tech intervention so I monitored several related mailing lists for months and the problem of super-weeds was discussed so I conducted further research and then decided to make my own."

As a result of his efforts, Bunting's "SuperWeed" "contains a mixture of naturally occurring and genetically mutated (GM) Brassica seeds (Oilseed Rape, Wild Radish, Yellow Mustard, Shepard's Purse). If these seeds are allowed to germinate and cross pollinate, a Super Weed will be created that will be resistant to current herbicides (e.g. Roundup[05]), thus not only threatening the profitability of conventional and GM Brassica crops, but also of herbicide production and distribution as well."[06] His intention with the project is to advocate a type of biologic terrorism, where "If you feel that the authorities are not going to respect the wishes of the majority of the population for a ban on GM crops (currently 77% in favor of a total ban), you could choose to cultivate and release SuperWeed 1.0 into the environment."[07] Although this may seem antagonistic to some, Bunting's focus is to create equilibrium between GM crops and their natural surroundings since naturally occurring weeds have no chance of effecting current GM crops.

Despite this seemingly highly tactical approach, Bunting also be-

01 News Target, "Genetically modified foods more common than many Americans think, survey shows", http://www.newstarget.com/006073.html

02 "Survey: Most folks unaware they have been eating biotech foods for years", Associated Press, March 24, 2005, http://www.journalnow.com/servlet/Satellite?pagename=WSJ%2FMGArticle%2FWSJ_BasicArticle&c=MGArticle&cid=1031781758183&path=!nationworld&s=1037645509161

03 Organic Consumers Association, "Mass Protests Against Frankenfoods in Italy", http://www.purefood.org/ge/italyprotest.cfm

04 "Food for thought: Report reveals risks of GM items", Times of India, June 4, 2005,, http://timesofindia.indiatimes.com/articleshow/1132155.cms

05 http://www.monsanto.com/monsanto/layout/products/productivity/roundup/default.asp

06 "Rise of 'Superweeds' blamed on GM crops": http://millennium-debate.org/ind5feb02.htm

07 Buntingova internetska stranica: http://www.irational.org

lieves in diplomacy as a method for discouraging corporations to invest in GM products. He states, "Alternatively you could choose to create your own propaganda campaign threatening biotech corporate interests with this genetic weapon. Whatever you do, the threat is often as effective as the execution."[08] This approach seems to be working, as a recent article in the New York Times about the "SuperWeed" detailed how MIT-based researcher Joe Davis, the so-called "father of American bio-Art"[09] spoke against "SuperWeed" when he said "I don't understand why [Bunting] wasn't arrested. Suppose I'm against gas stations. Does that give me the right to walk around them with a pack of matches?"[10] This type of response, although seemingly negative, is an indicator of the current hype surrounding these crops and how far their integration into popular culture has grown.

So why attempt this project? Bunting contends, "GM is dangerous to health of all animals and plants." On a social level, he believes that "GM is primarily a mechanism of colonization by rich criminals." This assumption pertains to the impetus of food manufacturers to use G.M. crops in order to avoid the costly process of filtering out inedible products for those worthy of bringing to market. Also a GM yield will hypothetically bring a higher profit since GM crops are typically larger and heartier than non-GM crops. However, what they bring to size, they often decrease in flavor from their predecessors.

Currently, corporations have been using GM crops as way to increase their yearly yield and thus profit from the investment. They also propose GM crops as a method of "improving the nutrient composition of crops, such as the protein content of rice or potatoes or to increase the tolerance of crops to adverse growing conditions, e.g. drought or pests."[11] Other claims intended to quell protests among the public are "that [GM crops] improve sensory attributes of food, e.g. flavor, texture [and also] improve the processing characteristics so as to reduce wastage of food and minimize the cost during transport and storage."[12]

One corporation spearheading the development of GM crops is the Monsanto Corporation, based in St. Louis, Missouri. "Monsanto's development and marketing of genetically engineered seed and bovine growth hormone, as well as its ag-gressive legal and lobby practices have made Monsanto a primary target of the anti-globalization movement and environmental activists."[13] For instance, the Organic Consumers Association of America (OCA) has started a "Millions Against Monsanto" petition encouraging farmers and consumers to rally against the corporation. Their goals with the petition are to " 1) Stop intimidating small family farmers. 2) Stop force-feeding untested and unlabeled genetically engineered foods on consumers. 3) Stop using billions of dollars of U.S. taxpayers' money to subsidize genetically engineered crops—cotton, soybeans, corn, and canola."[14]

Although most of these crops are used in fast-food items and processed foodstuffs that are often disregarded by the average consumer, the company has been blamed for not reporting results from studies of the crops on laboratory animals. "According to the London based Independent which broke the story, secret research carried out by Monsanto shows that rats fed the modified corn had smaller kidneys and variations in the composition of their blood."[15] These types of findings bring into question the long-term effects on humans once the crops are thoroughly integrated into the food chain. This debate has turned the topic of GM foods into a global concern.

Even though Bunting is rallying against the crops with the work, the project nevertheless introduces his own form of GM crop into the natural environment. The result of this output might be disastrous in itself. Bunting's Superweed could theoretically cross-pollinate and create a hybrid GM plant. This resulting crop might pose even more of a threat than the original. Despite this criticism for the project, Bunting believes that the Superweed is merely a reaction to an existing reality. He bluntly states, "Guerrilla warfare steals the weapons of its enemy," referring to the fact that his "SuperWeed" is a GM crop in itself.

As the debate over GM crops intensifies, there is a need to question the fundamental widespread use of these plants. Projects like Bunting's SuperWeed are reminders that the effect of GM has become a moral debate to most of the world's population. Despite the fact that most people would deny that they have ever consumed GM food, the reality is that its integration into commercially available products is already becoming increasingly widespread. What Bunting's work shows is that this debate is something serious enough to need clarification from

08 Ibid.

09 [Preuzeto iz New York Timesa]
http://www.nytimes.com/2005/07/03/arts/design/03kenn.html/ , June 3, 2005, "The Artists in the Hazmat Suits", autor Randy Kennedy

10 Ibid.

11 http://library.thinkquest.org/C004033F/pros&cons_text.htm

12 Ibid.

13 Wikipedia: "Monsanto, Genetically Modified Food" (http://en.wikipedia.org/wiki/Monsanto)

14 "Monsanto to Public: Ignore the Rats and Eat the GMO Corn
OCA Reacts to Monsanto's Latest GMO Deception", Organic Consumers Association: http://www.organicconsumers.org/monlink.html
http://www.organicconsumers.org/ge/corn-study.cfm/7645509161

15 Ibid.

authorities as to the direct ramifications of continued consumption of the crops. Although the crops appear to have no confirmed harmful side effects, the general wariness to consciously try them is widespread. With their continual integration into the food chain, projects like "Super-weed" stand as reminders that GM crops are here to stay and we must adapt (or react) to them. Despite our many protests, we have or are already consuming the crops. As global population steadily increases this reality will become increasingly apparent and undeniable.

> Jonah Brucker-Cohen <

System.hack(5,"locking", "Michael Steil – Linux On Xbox")

"My name is Michael Steil, I am a legitimate Xbox owner. I have fully paid the price for it, and I own 6 original games. I live in the European Union and I never signed any End User License Agreement (EULA) or Terms Of Service (indeed, none came with the Xbox), thus I am not bound therefore to any agreement or contract. Thus I regard the Xbox as my own personal property. (I am aware that within the US certain restrictions may be claimed by Microsoft, however as a citizen of the EU, residing wholly within the EU, any limitations of the usage of the Xbox described in any EULA would be inapplicable, nor their questionable legitimacy in the US and further; just using the Xbox would not mean that I agree to them.) It should also be noted that my Xbox is not 'modded' in any way."
— Michael Steil, 10. October, 2003

> Michael "mist" Steil lives in Munich and has been involved with computers since the age of ten. Starting on the Commodore 64, he has always had an interest in microprocessors, embedded systems and operating systems. He is the head of the Xbox Linux and GameCube Linux Projects. The above quote is his public protest against the privacy violations he encountered while using the Xbox. Steil had in-

stalled the GNU/Linux operating system on his Xbox. One day he accidentally hit a menu item that initiated the update of Xbox software, and without a warning or consent it erased data from the GNU/Linux system on his machine. Steil saw this intervention, the result of the Xbox settings, an intrusion of the manufacturer into private property, his own property in this case, and this provoked him to react.

The Xbox is Microsoft's game console. When it debuted on the market in 2001, hidden within the Xbox was a really powerful PC, with a 733 MHz Intel Celeron processor, an 8GB-10GB (formatted) hard drive, 64MB of RAM (although on all earlier boxes this is upgradeable to 128MB), and 4 USB ports (the controller ports are just variations of standard USB 1.1 ports). Microsoft offered the Xbox at a price well below the market price of a comparable PC, counting to make up for the loss with profits from sale of the games for the console and by becoming the dominant player on the gaming console market (and thereby to establish a de facto market standard), overpowering Sony PlayStation.

Seeing a possibility of getting their hands on some cheap hardware for existing free software, which would be also subsidezed – what an irony – by the biggest opponent of the free software, Microsoft, the hacker community started working on porting GNU/Linux to run on the Xbox. The significance of cheap hardware with free-of-charge free software in terms of social importance and development for the developing world, was rather obvious. But, to prevent access to cheap hardware at its expense, Microsoft had cippled that powerful machine for all uses but one – gaming.

The Xbox uses a digital signature system to prevent the public from running unsigned code, accepting in this case only Microsoft's digitally signed code. This type of technology is called trusted computing. Although it has many security applications, it deprives the user of the ability to control her own hardware, turning it, as Richard Stallman says, in a computer the user can't trust. It is this trusted system that deleted the GNU/Linux operating system from Steil's Xbox and infuriated him.

To confront the immeasurable consequences of mass introduction of this kind of trusted systems into user electronics (the consequences we already face today in the form of different Digital Rights/Restrictions Management sys-

tems), and to use the opportunity to attain cheap hardware for free software, in 2003 Michael Robertson, the CEO of the open source company Lindows, funded two $100.000 bounties for anyone first to install GNU/Linux on Xbox by using any means available and later for anyone first to install it without a hardware modification. Originally, modchips were the only option. However, it was later demonstrated that the TSOP chip on which the Xbox's BIOS is held may be reflashed. Finally, a buffer overflow found in one game allowed for the booting of a GNU/Linux loader without hardware intervention. This is what Steil's Xbox Linux team succeeded at doing.

In the meanwhile, there's an increasing number of such projects attempting to use the free software in order to set free powerful machines lying hidden behind hardware locks in contemporary user electronics – the iPodLinux being probably the most popular.

At the end of 2005 Microsoft unveiled the new generation of its gaming console – the Xbox 360. Beginning of 2006 a project to set it free followed: Free60.

How to Sell Free

> For as long as there have been advocates of free software, every once in a while an enthusiast embarks on to listing the merits of free software, usually with the goal of showing how free software brings about many advantages for the users, developers and companies. Either implicitly or explicitly, almost without exception, such manifestos contain the expectation of imminent revolution in software, not yet underway just because consciousness of the masses of computer users hasn't yet reached desired levels.

Yet, I can't recall any of these analyses to open the preceding question: why free software, having all those advantages, isn't socially more successful? None of the most influential computing projects in the last quarter of a century were free – in fact, none had any connection to free software. In social sense, free software was and still is ephemeral. Considering its social emphasis, this is by no means an obvious outcome.

In what follows, social success will be defined as a combination of mass usage and innovation, while dynamics of IT economics will be presented in terms of economics of complementary and substitute goods. It will be shown that behind most successful products in short history of microcomputing lie some good hacks, manipulations with complements and substitutes. Xbox Linux will be discussed in this context.

The shortest history of microcomputers ever

From the late seventies, microcomputers have developed on two parallel tracks of use, home and school or business use. The Apple II (1977) became standard school equipment in the US, its VisiCalc spreadsheet application later introduced it to companies. Different computers that used the Zilog 80 processor were powered by the CP/M operating system (1976), the first business operating system for microcomputers. Many business applications were written for CP/M, from the revolutionary database management system dBASE, the also revolutionary text processor WordStar, to VisiCalc for CP/M.

In 1981 IBM joins the game with open PC architecture, a Microsoft's CP/M clone and more powerful Intel processor. Independent producers begin creating a myriad of cheap PC extensions, increasing the value of consumer investment in a PC (more on this strategy later). All important CP/M software comes out with new DOS versions, and by the late eighties PCs (IBM's or not) are in every office and school. About the same time the PC appeared, a third segment of the market opens up, home computers, mostly developed independently. In mid-eighties Apple releases Macintosh, the first relatively popular graphic interface microcomputer. By the end of eighties, the gaming market gradually migrates to PC and DOS.

In 1992 Microsoft releases Windows 3.1, encompassing all segments of the microcomputer market. On a single machine, with a uniform graphic interface, the user can now do it all: write, draw, calculate, play. All DOS applications run on Windows, requiring no modifications and zero investment. And since all users now need similar machines, computers finally become cheap, at least to those living on the right side of the digital divide.

From the mid-eighties onward, operating systems gradually transform into the minicomputer model, designed for true multitasking and multi-user networked operation. The first to break the ice was Microsoft in 1993 (Windows NT, inheriting VMS OS architecture), then came the free software community with its version of Unix (GNU with Linux kernel, effectively by late nineties). The last to come was Apple (Mac OS X, 2001), also Unix-based.

Social success

For the purpose of this argument, socially influential technology by definition meets two criteria: widespread use and innovation. Both are relative: the Apple II was socially influential because computers were previously used only by engineers, bankers, military and exceptionally apt computer science students who built their own machines; CP/M was not socially influential because only a minority of secretaries and bookkeepers used it, although it was innovation in technological sense. Windows 3.1 were socially influential because they offered an ergonomically superior graphic interface to all segments of the market,[01] with full DOS compatibility.

Where on this map lays free software? Nowhere, really. From 1983 to present time, from the aspect of social influence (so, widespread use and innovation), free software has not made one single breakthrough. Today's most widespread free software applications are network-related, e.g. web server Apache and (although, in terms of market share to a much lesser extent) Mozilla's web browser Firefox. The ascent of the Internet, especially the World Wide Web, made network-related software significantly more important, but both Apache and Firefox are actually socially irrelevant. Why? Im-

79

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01 **Superior to the DOS interface, not necessarily to other graphic interfaces that were not widely used.**

agine for a moment that they didn't exist. What would change? Nothing. The same number of people would browse through a more or less same number of web-pages served in a more or less same way.[02]

In all honesty, I believe there actually is one exception to this verdict: Ward Cunningham's Wiki. Wiki is truly innovative and in twelve years it has become a widely used concept through uncountable variations, and some spectacularly successful applications (e.g. Wikipedia).[03]

How to make sense of this, having in mind that software freedom does bring great potential advantages to the user? Proprietary software is a closed source "product" (executable code). The product is someone else's intellectual property, and the owner allows users to use the product under terms prescribed – this user-license is what we purchase when we purchase proprietary software. No free software license is user-license. All they regulate is dis-

tribution, and we are free (i.e. allowed) to use the software, its source and executable form, in practically any way we see fit. (In the case of GPL licensed software, "practically any way" means "on the condition that modified versions shall also be presented under the GPL, in case they are to be distributed".[04])

For the sake of the argument, let's assume we have one typical proprietary software product on one side and on the other an almost identical free software product. Let's then assume they both cost the same. Taking into account only the value for the user, what software permits us to do with it (everything else being the same), the free software always has equal or greater value.[05] Both programs would be of equal value only in the case where we would never want to do anything with the free software which the owner of the proprietary software product would not allow us to do. In all other cases, free software has

greater value for the user than the equivalent proprietary software.[06]

So, if free software is in principle of greater value for the user, and thus more desirable, why is it less socially successful? Or, what impairs wider use and higher level of innovation of free software? The problem stems from two sources: the character of the free software user/developer community and the peculiarity of the economics of free software. Let's try to address them both.

Tradition, society, community
Let's briefly look into the history of the creation of free software. Richard Stallman, a software developer from Massachusetts Institute of Technology (MIT), envisioned the GNU project in such a way that he made sure that both targets (widespread use and innovation) would be missed from the start. GNU attempted to replace the existing development environment of proprietary Unix systems, not to create something new. Second, Unix was (and remained until recently, until the Apple Mac OS) an operating system designed for IT experts and other technologically savvy scientists, not for the laymen. The difference from socially influential personal computers is evident: Apple II turned to students and teachers, DOS to accountants and other office workers, Windows to gamers, visual artists, musicians, public speakers and others. The ethos of the Unix world and the personal computer worlds were different from the start:

Unix users value and expect IT merits, personal computer users value ease of use while solving tasks that by themselves do not necessarily have to do anything with IT.

Stallman himself has taken an especially exclusive stance towards IT laymen by stating that all use of proprietary software is immoral. Thus he puts a moral imperative before, for example, an artist to use free software that, although it is suitable for an IT expert but not for an artist, effectively wasting her talent on solving technical issues (or worse, suppressing it until more usable free software comes along). Besides being morally questionable, this type of techno-autism clearly doesn't favor communication with the users who have other talents and those less interested in technology as such.

In general, traditional free software users are its developers, either directly, when authors use their own products, or in the case where authors expect users to have the level of expertise comparable to their own. This can work out marvelously: persons approaching the description of the ideal user usually find the software perfectly fitting. If you were a developer whose primary language is LISP, could you imagine a better working (and non-working) environment than Emacs, an application dealing with all sorts of text, written in a dialect of LISP and thus perfectly comprehensible, adaptable and expandable when in your hands. For the entire portion of the population that fits this description (one hun-

80

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02 Those familiar with free software will protest – the source code of Apache and Firefox is still here, free to be used in other applications, even if Apache and Mozilla foundations cease to exist. It is a feature, not a bug. But, I wish to say something else: even if all that code disappeared, including the executable programs, even if all the developers' memories of the elements of those programs were to be magically erased, still nothing would happen. Neither the idea, nor first implementation or any revolutionary advancement of web-server came about with the Apache project. The same goes for Mozilla's web browser.

03 http://en.wikipedia.org/wiki/Wiki

04 http://www.gnu.org/philosophy/free-sw.html

05 This argument was first presented at news-group hr.comp.gnu, in a message titled „SOK i MESO za velike kupce" on December 19th, 2002.

06 In favor of free, or open-source software, its advocates usually call upon two different criteria. The Free Software Foundation (FSF), following Richard Stallman, claim free software is the only moral software, both for the developer and the user. The Open Source Initiative (OSI) claims, on the other hand, that the development model inherent to free or open-source software is superior to the development models of proprietary software. My view is that the first claim is simply meaningless, while the second is empirically unfounded.

dred in a billion?) using Emacs probably feels like heaven.

As we move away from the happy marriage of skilled developer or IT expert and primary user combined in one person, this lovely idea turns into a nightmare. For whatever you want to do, there is probably some free software available, it's just not clear who can use it and how. A photographer working with any one of the specialized proprietary software image processing products and wishing to experiment with a dynamic range of photographs, can choose the appropriate item from the menu of available special effects, and try out a desired procedure without much knowledge of underlying technology. A user of a free software product will achieve the same result, should he become familiar with details of physics and technology of the dynamic range in photography, master the basics of one or the other script language, and find the appropriate tools to combine and manipulate. Like this: [07]

```perl
#!/usr/bin/perl
open I, "> /tmp/hdr-in";
for $f (@ARGV) {
$jh=`jhead -c "$f"`;
chop $jh;
if($jh=~/\(1\/(\d+)\) f\/([\d.]+)/) { $e=$1; $a=$2; }
if($e<2) {
$jh=`jhead "$f" | grep "Exposure time"`;
if($jh=~/:.*?([\d.]+).*?s/) { $e=1/$1; }
}
$n=`basename "$f" .jpg`; chop $n;
print I "$n.ppm $e $a 0 0\n";
print "preparing $n (1/$e f/$a) ...\n";
system "convert '$f' -geometry 1024x1024 '/tmp/$n.ppm'";
$d=`dirname "$f"`; chop $d;
}
close I;
system "cd /tmp; mkhdr -fptiff hdr-in $d/$n-HDR.tiff";
system "pfsin $d/$n-HDR.tiff | pfstmo_fattal02 -b 0.85 | pfsgamma -g
2.2 | pfsout $d/$n-HDRfattal.jpg";
system "pfsin $d/$n-HDR.tiff | pfstmo_drago03 | pfsgamma -g 2.2 |
pfsout $d/$n-HDRdrago.jpg";
```

Which user approach do you think will bring about greater social success and popularization of computer aided image processing?

In my opinion, the weakest link of free software has nothing to do with programming, the problem is in what the programmers do not know or are simply not interested in. To attain social success, free software needs people who are not programmers or IT workers: interface designers, usability experts and psychologists who will test it; language experts who will create proper spelling- and grammar-checking systems, thesauri and so on.

Economics of free software

Most of the free software economics, and much of software economics in general, revolves around the concepts of complements and substitutes, with the underlying process of turning complements of a targeted product into commodity.[08] The great "hacks" in IT economy are manipulations with complementary products. The basic principle of economics of complements amounts to: a product is more valuable to buyers (can be priced higher and/or sold in larger quantity) as its complements get cheaper, ideally when they reach their lowest, commodity price. IBM has made PC architecture open, and has thus started market competition for hardware devices by independent producers. The availability of a large number of various PC add-ons made the PC itself more valuable. At the same time Microsoft performed an even better gimmick: they did not grant IBM exclusive license for DOS, but sold it also to other PC vendors, effectively lowering the price of hardware and finally making DOS-based software more valuable.

While the game of complements is an important ingredient in haute IT cuisine, for free software it is often the only economic model available. Crucial restriction of some of the most, well, restrictive free software licenses refers to strictly defined mode of distribution, effectively putting standard business model of end-user licenses out of the game. In other words, for companies whose primary business is producing software for mass market, free software is untenable, at least GPL-ed free software.

These days, IBM and various smaller companies are attempting on another variant of the same hack by investing in free software and selling consulting, design and other specialized services, using free software as a cheap complement. Probably the biggest profit from free software is made by Google, a company that heavily invests into free software, using it in the server, and more and more, in the client (the Firefox browser) infrastructure of its advertising empire.

07 This example is not invented, the script is functional and licensed under GPL. The author is a physicist and photographer Domjan Silović. Source: hr.rec.fotografija.digitalna, April 21ˢᵗ, 2006, under the title High Dynamic Range.

08 More on this in the textbook exposition by developer, businessman and writer Joel Spolsky, see: http://www.joelonsoftware.com/printerFriendly/articles/StrategyLetterV.html

Looking at financial reports, we can conclude this strategy pays. Still, IBM's and Google's customers are big businesses and advertisers, not the mass of "small scale consumers". For most software users and most uses, the best available software still belongs to the category of proprietary software. Although it is true that the improvements resulting from business of free software contribute to the whole community, many of them don't address the consumer market directly.

• **THE GRAY ZONE**

Pulling up this commoditize-your-complements trick isn't easy, though, even less so in standardized infrastructural environment, where "everything works with everything". Therefore, many vendors try to make things easier for themselves, by making it harder for users to use what should be complementary to the vendor's product, in less desirable ways.

A mobile phone is complementary to telecommunications services, so telecoms routinely offer phones at the fraction of usual retail price. What's the catch? The catch is that "their" devices are locked to their network, which renders them unusable as a complement for services of other operators, although all modern networks in mobile telephony are completely standardized so any device is originally fully operational in every network.

Locking mobile phones is but one of the more visible forms of playing dirty in the game of complementary goods. In the context of IT, really nasty ones include introducing proprietary network protocols like Microsoft' SMB, or late AppleTalk and Novell IPX. The idea is similar, though: if you need to connect several machines into the network, we'll be happy to oblige. Provided that you buy, for each workstation, our software (Microsoft or Novell), or even better, both our software and our hardware (Macintosh with Mac OS). Fortunately, such swindling rarely succeeds in the long run, and IPX and AppleTalk are mostly abandoned by now, while SMB is still alive and kicking, but hopefully not for long.

In the world of console gaming, locking of complementary product is considered perfectly normal. Nintendo, Sony, and recently Microsoft sell consoles relatively cheaply in order to make money on relatively expensive games. Not unlike a mobile phone, Microsoft Xbox, technically speaking, is a standard PC locked to applications profitable to the locker, and locked out from all other uses. That is, it was locked before Xbox Linux did their job.

Xbox Linux project is a show off of disobedience to one type of IT racket, but it's also interesting because it doesn't really pose any threat to Microsoft. There is a ton of different ways to put up an equally cheap Linux box, usually much better suited to task at hand than an ex-Xbox, so I'd be surprised if significant number of people actually bought their Xboxes *solely* for the purpose of running Linux. That leaves us with the target audience of Linux users which are also console gamers, and they will have to buy the games anyway. What was the locking in for, then? In the case of gaming consoles, it's meaningless. That is demonstrated by Xbox Linux, but even more by the fact that the dominant console gaming vendor, Sony, officially supported Linux for PlayStation 2 and remained dominant.

• **WHAT, HOW, FOR WHOM**

Computing has so far brought about enormous changes to the ways we learn, have fun, live and work. But, who are "we"? We belong to the 15% of global population who have a computer connected to the Internet. In other words, we are all just a handful of early adopters, beta-testers of a technology that may one day become widespread.

Initiatives to bridge the "digital divide" and reach the remaining 85% of potential users are closely tied to manipulation with complement goods. The first to make a move was MIT Media Lab's Nicholas Negroponte in 2005, with the $100 dollar laptop project.[09] The idea is that governments and international organizations finance hardware, and the free software community contributes with the software. Once again, free software has assumed a role of a complementary good to hardware and political will. One year later, Microsoft announces FlexGo, a full-featured PC platform running Windows OS, financed like mobile phones, i.e the device if sold at half the retail price, the rest being paid through pre-paid or subscription time.

This concept is a rather natural extension of Microsoft's traditional business model where complement goods, hardware, is made affordable in order to make software more valuable for the user and more profitable for the owner. In one possible FlexGo scenario, basic hardware could be free (as a beer) and software leased instead of selling user licenses. This model promises even bigger profit margins, if sufficient number of new users join in – remember, we're talking billions of people who can't afford owning a computer but use pre-paid mobile phones.

It goes without saying that FlexGo computers will be locked. The Xbox Linux episode should probably be best understood as warming up before the big battle for computerization of the global south. Although FlexGo computers will be hardware-locked, apparently on the processor level, future FlexGo-Linux guys may be facing the easier part of the job. When asked "Do you wish to pay for proprietary software or use free software as you please?", the vast majority of the first billion opted for the former clause. The rest is likely to be given more appealing offers from the proprietors.

09 One Laptop per Child, http://laptop.media.mit.edu/

Between a rock and a hard place

From the perspective of our second criterion for social success, the middle-man business model in free software is only exceptionally oriented towards innovation. However, the problem of economics of innovation in free software is not just a byline, but a deeply structural one. Every software innovation that the investor estimates may provide strategic advantage will be closed (will not be distributed at all, or will be distributed as proprietary software).

The most profitable retail business models in the software industry are distribution of user licenses of proprietary software and leasing resources. Therefore, the most desirable consumer software will probably stay proprietary. On the other hand, it is extremely difficult to capitalize of innovative free software and it is unclear what economical logic could surpass this problem.

One possible, if only partial, solution was offered by Nicholas Carr in his article *IT Doesn't Matter*[10] and a series of later publications. Although Carr's arguments do leave much to be desired,[11] and his hypothesis in its most radical version is most likely untenable, Carr has found a possible path of social success of free software.

Carr's main hypothesis is that information technology reached its maturity and now rapidly looses strategic importance. Consequently, IT ceases to be competitive and becomes infrastructure technology. If this is even only partly true, this is great news for free software. Free software has seen its biggest successes in the domain of web services and protocols, and with the shift of the market to infrastructure, its relative value will considerably grow. Second, and more interesting, is that the nature of infrastructural innovation is different from the competitive; infrastructural innovation doesn't seek to stand out from its competition, but to blend into the existing frame and widen it to the benefit of all.

There are serious economical and social reasons for the absence of social success of free software, both in terms of widespread use and in terms of innovation. The main obstacle to wider use of free software is the failure of the community of its developers/users to include in their ranks more IT laymen. At first sight, it seems to be a vicious circle: there will be more users when there will be more of them, but it's not really so. Among the IT laymen are experts in fields important for mass IT, experts like visual designers, linguists, psychologists and others. But, it is necessary that they also find their motive for the use and development of free software, that they feel that community wants and needs them. It seems the ethos of the free software community is increasingly shifting in that direction, so we can be somewhat optimistic in that respect.

The problem with innovation doesn't seem solvable within the current economical framework of competitive market. Still, one possible solution may arise from the change in the framework of IT economics, namely from the shift to infrastructure. In that case, the most significant contribution to a relative success of free software in the field of innovation will be the failure of the proprietary. As for how much good this will bring in the Grand scheme of things, I wouldn't dare saying.

> Ognjen Strpić <

10 Nicholas G. Carr, "IT Doesn't Matter", *Harvard Business Review*, 81(5): 41–49, (2003). see also: http://www.nicholasgcarr.com

11 See *Hogwash Voodoo*, my reserved op-ed on Carr and the future of IT (in Croatian, *"Gnoj i pakao", Mreža* 9(3): 21 (2006).

System.hack(6, "protection","Anonymous – CD Protection Kit [marker / shift key]")

> Hackers can be placed into two groups with respect to their ethics: while the first group creates patented systems and protection mechanisms, the other group tries to circumvent them. While the first group is corporate-oriented, other group is activist. Ever since the potentials for copying created by digital technologies have started to challenge the intellectual property regimes, the music, film and entertainment industries have gone to extreme lengths to make the legal protection measures severe, to introduce technological copy protection measures and to criminally prosecute until recently legit practices of studying and circumventing such technological means of controlling intellectual property. The knowledge driven by curiosity to explore the technological systems of control has become outlawed knowledge, and the hackers have been ostracized as dark characters commanding the knowledge the state apparatus and companies would like the society to entrust only to state apparatus and companies.

This exhibit deals with the CD/DVD copy protection systems and the trivial techniques that can be used to circumvent them.

The technological CD/DVD copy protection systems are mechanisms preventing the users from copying CDs or DVDs. These systems vary, but the technologies which are employed often break the basic functionality of end-user equipment to play the content stored on the medium. The software-only CD copy protection systems proved to be trivial to circumvent, while the alternative strategies modifying the CD data format inevitably lead to complaints from the public because incompatibilities with CD and DVD players.

However, the earlier generations of copy protection measures proved to be even more trivial – they became famous for being easily circumvented with a marker pen, by drawing a tangential line on the rim of the visible edge of audio data.

These systems rendered CDs incompatible with most computers. Although this effectively prevented copying in many PC configurations, it also reportedly caused incompatibility with some DVD players, video game systems, and car CD players. Such perfect compatibility can only be achieved by leaving the standard CD audio portion of the disc unprotected, so MediaMax uses another method to block PC-based copying.

In 2001 Sony, for instance, applied to its CDs Key2Audio system a technology preventing the copying or ripping tracks into MP3 files on personal computers. Technological music CD copy protection systems such as Key2Audio or Cactus Data Shield 100/200 can be defeated by a marker pen or sticky tape. The rim of the visible edge of audio data is protected disabling the copying and playing on a PC. By covering this outer edge the protection can be circumvented and the disc enabled for normal use on computers.

In 2003 SunnComm created a system, called MediaMax CD3, designed to prevent unauthorized copying of audio CD-s on a PC. Discs manufactured with SunnComm's technique included two versions of the music, each protected in a different way. One set of songs were CD audio tracks that play in standard CD players but were supposed to be difficult for computers to copy. The second set are compressed, encrypted Windows Media files that employed digital rights management (DRM) – technological means of enforcing copyright – to restrict how they are used.

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patibility with some DVD players, video game systems, and car CD players. Such perfect compatibility can only be achieved by leaving the standard CD audio portion of the disc unprotected, so MediaMax uses another method to block PC-based copying.

Soon after the first disc with MediaMax CD3 protection was released, John Halderman, a graduate student from Princeton, published on his web site an academic paper analyzing SunnComm's protection method and how easy it can be circumvented – by holding down the shift key. This method was first applied on an Anthony Hamilton album released by BMG.

Under usual circumstances, whenever the Hamilton album would be played in a computer CD player on a Windows machine, it would auto-run the anti-pirating software disabling copying or ripping into MP3 format. However, holding down the shift key when inserting the CD would prevent the Windows auto-run from running the copy protection software, allowing for the music to be copied.

After Halderman published his paper, SunnComm pressed charges against him, citing the Digital Millennium Copyright Act which prohibits exploring and publishing of digital rights management circumvention methods. However, SunnComm soon after droped the charges.

End of 2005 Sony introduced the Extended Copy Protection, the infamous Rootkit, on its CD. The system would, without informing and seeking permission, install on the user's computer software which was vulnerable to worms and trojans. After Mark Russinovich revealed on his blog the analysis of Sony's illegal software and drew attention to user privacy violation through the application of this DRM, the pioneer cyber-rights organization Electronic Frontier Foundation initiated a civil lawsuit and criminal investigation forcing Sony to offer an uninstaller, and eventually to recall the CDs and bargain the settlement.

The most famous DVD copy protection circumvention case was created by DeCSS, a software created in 1999 by the Norwegian hacker Jon Lech Johansen in order to enable playing of commercial DVDs, copy protected through the Content-Scrambling System, on free operating systems such as BSDs or GNU/Linux, on which, prior to that, it had been impossible to watch DVDs. But, in order to make it possible to watch DVDs, DeCSS had to circumvent the protection system used on DVDs, which didn't have open specifications available to the free software community. Soon after the DeCSS code was published, DVD Copy Control Association and Motion Picture Association of America pressed charges against Johansen. After 5 years of court litigation he was acquitted.

Hackers can only laugh out loud ;)

92

> Society likes to create heroes, just as it likes to find someone to stigmatize in order to shift the focus from the traumatic spots it doesn't want to face. Hackers are just made for both.

When an intrusion into a foreign military system can serve to raise national pride, a (usually) eyeglasses-wearing kid from the neighborhood is quick to receive his fifteen minutes of fame. But meanwhile hackers are to be feared and as such (meaning: as dangerous) to be stigmatized, because hackers know how to and are able to control and do everything a society would usually allow only its intelligence and mega-corporations. We consider intelligence and mega-corporations accountable. The myth of hacker assumes a genius of evil and an unaccountable one.

Such myths are fabricated and sustained in today's culture by means of dominant instrument of interpretation: market logic. Market logic sees representation (brand, logo, slogan,...), competitiveness (competitive advantage, comparability, ...), material interest as prime motive (profit) and the ultimate reducibility to the measurable (number).

Market logic is the last instrument (on the list) one should resort to when analyzing and trying to understand the hacker community and hacker culture. Just as hacker culture takes the last on the list to be the nearest to the first in the opposite direction, the market logic can (after all) serve as that other instrument to which ungraspability and complexity of the matter studied, through its dialectics and negation, can be demonstrated.

In order to reduce hacker culture to a level where it becomes comparable to other cultures that we are familiar with today, Hollywood and the rest of the media machine had to invent the 'hacker' who can in mere thirty seconds, while at the same time being additionally aroused by fellatio, break into the best protected computer systems or the 'hacker' who (from a location in Hollywood) can use a popular terrestrial portable computer and somewhat less popular operating system to break into the alien computer system. And when it comes to presenting the actual history of hacker culture the story is again a familiar and comparable one: (it is called) the Triumph of the Few. Of the Few who

were the most successful in the marketplace. Or alternatively, of the Few exotic leaders (of something) or of the Few convicted for cyber-crime.

Just as market logic has not been capable of presenting a community, culture (or ultimately a product) without a brand, a model-figure or a logo, it is also under-capacitated for evaluating and analyzing the criteria of success of that community/culture. One frequently employed criterion for evaluating the hacker community is the quantity of innovations it has produced. Naturally, the prerequisite for this criterion is a comparison with non-hacker, corporative culture.[01]

Every discussion on a definition of innovation will quickly demonstrate that it derives directly from the market logic and that the innovation is ultimately reducible to several concepts and numbers: patentability, number of patents, breakthrough...[02] Uniqueness and maximal differentiation from anything surrounding is a prerequisite for recognizability and success in the marketplace.

Hacker culture is, however, much closer to a harmonious (yet highly dynamic) ecosystem where every new organism tends to find its posi-

tion of collaboration with its environment, and unique functionality and novelty that an organism introduces into an ecosystem is inseparable from its capacity for collaboration. Even in the case of apparent superiority and innovation, if the solution/new organism seeks a radical reconfiguration and repositioning of the entire ecosystem, it is unlikely that such a solution will meet with the approval, acceptance and adaptation by the system of such a radical innovation.[03]

The innovation criterion is limited and produced by the interpretative tool of market logic, which primarily leads to a patent certificate, is almost unappliable as an evaluation criterion for production within hacker culture. Conditioned by market logic, an innovation requires a very specific type of product *formatting* in order for the product to be recognized (in the marketplace) as innovative. The hacker community produces libraries available to everyone, rather than final products for end users, both in the technical and metaphoric sense.

Measuring innovativity and inventivity of hacker culture and/or results of collaborative production models (such as GNU/Linux, *BSDs

93

01 In parts of the text on innovation and production within hacker culture I will mostly equate hacker culture with the FLOSS (Free/Libre Open Source Software) movement culture, which, to me, represents the best of hacker culture as a whole. This is of course not to say that hacker culture is reducible to the Free Software Movement, and particularly not the vice-versa.

02 At the Tesla Museum in Belgrade, to bear testament to Tesla's greatness, the guides will always stress the number of patents awarded, while (almost) never ever mentioning the word "innovation".

03 The best example of such an innovation is the bumpy road the Reiser4 file system had to pass before it was included into the Linux kernel.

or other projects) must, firstly, be re-thought through new interpretive tools, where market logic would be much more related to attention economy, but would even then account for a marginal and small part of a complex reflection on the innovation and inventiveness If we would avoid the pressure of market logic and the need for creating unique pop-stars in every field of human creativity, measuring innovation would always have to account for traces of what influenced a very 'recent innovation' and what it was building upon, i.e. indicate the collective nature of human creativity. In this sense, the hacker community is the best example how the idea of the collective nature of creativity does not endanger uniqueness and creativity of each individual (hacker).

Hacker culture produces a body of shared knowledge which results in creative and innovative hackers, whose innovative (yet for most unnoticeable) hacks make in turn the whole (e.g. a free operating system) much more powerful, creative and innovative, and in its openness more ready for a repeated iteration of innovative hacks.

Hacker culture is, unlike corporate culture, (primarily) an ecosystem of knowledge and not an economic system of commodities. Due to the hybrid nature of free software as information infrastructure, business models developed which treat free software as commodity, but the primary (collaborative) model of production remains in the domain of knowledge production and exchange. Hacker culture, existing in a complex environment of knowledge development and exchange, knows no market mechanisms which thrive on evidencing, producing and sustaining scarcity.

The prerequisite for knowledge distribution and production is collaboration, high permeability to circulation in all directions, and unrestricted, non-discriminatory access to knowledge resources. A better position in hacker culture is given to one who produces, collaborates and shares knowledge (both new and old) with others in the community.

A first step in hacker production is the production of a problem. A concrete elegant solution to a complex problem is only a second step (and not a necessary one). Complex problems are always confronted with through employing an abstraction (a metaphor). Complex abstractions require a recursive approach to abstraction, where those are confronted with through employing new (meta-)abstractions.

Every intriguing complex system that for any reason resists abstraction is bound to be soon *hacked* by the hacker community and submitted to further abstraction, creation and sharing of knowledge.

This kind of permanent reflection on the reflected creates a culture resisting any representation, because as soon as a representation emerges it becomes merely a new trigger (and focus) of recursive reflection. Reducing the representation of hacker cul-ture to representative names is the biggest mistake that can be made from the perspective of hacker culture. All attempts so far to give a representation of the history of hacker culture in a larger cultural context have almost regularly been a history of failures of all such attempts.

Anything that has a digital form or is only several steps away from being digitized falls within the domain of tinkering and abstraction for hacker community. No one knows better the digital domain than the hacker community. Information and ideas cannot be commodified and turned into private property. They can be hidden away, guarded and encrypted, but this cannot ensure they (i.e. ideas and information) will stay under the veil of darkness forever.

It is this moment of victory of hacker spirit over the interests of (state) control and (corporate) profit that fuels the creation of the myth about dangerous hackers who are capable of destroying the world (as we know it). United, the state and the capital, will do anything in their power in order to produce more fear, uncertainty and danger[04] around the destruction of the world as we know it. The continued status quo, to a great distress of corporations, cannot be upheld by the restrictions of innovative DRM (Digit-al Rights (*sic!*) Management) patents, so the state had to come to aid with legislative restrictions such as DMCA and/or anti-terrorist laws.

The state finds itself threatened by the widespread exchange of complex knowledge on (communication) technologies, the exclusive access to which had previously secured its undisputed and stable position of supervision, control and power. Corporations find themselves threatened by the lack of inventiveness in discovering new business models that wouldn't be founded on the exploitation of creative producers and barring of end users from sharing products of entertainment or of interest. Old business models, built on once innovative technologies, together with the state, have now for decades been stifling the introduction of new innovative technologies. At present day they are more and more spreading fear and panic.

The failure of creative (entertainment) industry giants to find a new footing in the emerging constellation of technology and (hacker) culture, shifted the primacy in the innovative profit-making industry to *spam* and *porno* industries. Hackers can only laugh out loud ;)

The absolute mobility of digital information, where the price with every additional copy being made is

04 This is a reference to a famous aggressive marketing strategy the IBM undertook in the 70s, where emphasis is placed on spreading fear, uncertainty and danger (FUD) about the competing product (instead of trying to show own product as being better). This is also the marketing strategy used intensively by Microsoft at the end of the 90s and beginning of 00s in its battle against FLOSS (Free/Libre Open Source Software).

tending towards zero, brings immense advantages for the entire human culture. Everyone (or at least 90% of computer users) who has gone through those couple of mouse clicks to access that huge quantity of human intellectual production is aware of those advantages today.

The state and market logic with their globally harmonized restrictive legal regulation of miscomprehension of the (no longer so new) digital world, schizophrenically criminalize anyone who has experienced the immense advantage of hacker culture. With their innovative patenting Goliaths, it is luck that there are hacks by the community of anonymous, for Hollywood uninteresting heroes, who reach for a marker or a shift key to turn this farce into ridicule and fun.

> Marcell Mars <