Tabla de contenido

Soberanía tecnológica: ¿De qué estamos hablando?

Margarita Padilla

Qué es

Querido lector/a, queremos conversar sobre la soberanía tecnológica, un concepto que quizás, todavía, no te diga nada.

Dice la Wikipedia que la "soberanía" es el poder político supremo y que es soberano quien tiene el poder de decisión, el poder de dar las leyes sin recibirlas de otro. También dice que es imposible adentrarse en este concepto sin tener en cuenta las luchas por el poder. Y que la historia va dibujando el devenir del sujeto de la soberanía. ¿Quién, en cada momento, es soberano?

Trasladando la cuestión de la soberanía a las tecnologías, la pregunta sobre la que queremos conversar es quién tiene poder de decisión sobre ellas, sobre su desarrollo y su uso, sobre su acceso y su distribución, sobre su oferta y su consumo, sobre su prestigio y su capacidad de fascinación…

Creo que en asuntos de poder no hay respuestas sencillas. Pero sí que hay horizontes deseables y deseados. Con esta publicación queremos pararnos a pensar sobre cuál horizonte tecnológico estamos proyectando, para aplicarle un juicio crítico y, sobre todo, para compartirlo.

En conversaciones informales sobre tecnologías, a menudo las amigas me dicen cosas como “es que yo de esto no entiendo”, “es que yo soy muy torpe con esto”... Entonces yo intento desplazar un poco la cuestión hacia otro terreno un poco más,político ya que creo firmemente que lo que una persona “suelta” sepa o no sepa, en realidad no es tan significativo en un planteamiento global sobre tecnologías.

Este desplazamiento ya lo estamos aplicando en otros ámbitos. Por ejemplo, no necesito, yo personalmente, entender de química para "saber" que el aire está contaminado. Y digo "saber" entre comillas porque en realidad no lo sé en el sentido científico de la palabra, pues nunca he hecho un análisis de contaminación atmosférica por mis propios medios. Pero sí que lo "sé" en términos sociales, pues hay muchas personas y grupos, en los que confía, que me lo han dicho. Para mí, la creencia de que el aire está contaminado es una verdad social.

Algo parecido ocurre con la alimentación ecológica. No necesito ir a cada huerto de cada productor/a ecológico a hacer análisis químicos sobre el valor alimentario de sus productos. Hay una cadena, un circuito de confianza, que hace insignificante lo que yo, personalmente, pueda saber o no saber. Me apoyo en el saber colectivo y en lo que ese saber compartido enuncia como verdades sociales.

De la misma manera, mi horizonte de soberanía tecnológica no está poblado por individualidades autosuficientes que controlan hasta el último detalle de sus dispositivos o de sus programas de ordenador o de móvil. No se trata de un individualismo tecnológico (yo entiendo, yo sé, yo, yo, yo...). No creo que el sujeto de la soberanía tecnológica sea el individuo (ya sabes, ese hombre joven, guapo, blanco, inteligente, exitosos... más que nada porque no existe).

Dónde se hace

Como todas las otras, la soberanía tecnológica se hace, sobre todo, en comunidades.

Las comunidades existen. Están por todas partes, haciéndose y rehaciéndose sin parar. El piso compartido, el barrio, las amigas, las compañeras de trabajo, las redes profesionales, la familia extensa... Hay comunidades por todas partes.

Como toda construcción simbólica, las comunidades no se pueden ver con los ojos de la cara. Tienen que verse con los ojos de la mente. Y sentir su vínculo con los ojos del corazón.

Esta dificultad hace que en una misma situación una comunidad pueda ser una realidad muy presente y activa para algunas personas y a la vez algo totalmente invisible para otras. Y esto es un verdadero problema porque si no ves por dónde andan las

comunidades, corres el riesgo de pisotearlas. Aunque, con frecuencia, a lo que aspira la industria de las tecnologías no es a pisotearlas sino a controlarlas.

Para las personas que luchamos por la soberanía tecnológica, las comunidades son una realidad palpable. Están ahí, las vemos y las sentimos. Aunque el estereotipo relacione tecnologías con consumismo, elitismo, pijadas, individualismo aislado... esto es solo la visión que dibujan la industria y el mercado. Un mercado que quiere consumidores aislados y que ofusca la realidad.

Todas las tecnologías se desarrollan en comunidades, que pueden ser más o menos autónomas o pueden estar más o menos controladas por las corporaciones. En la lucha por la soberanía, la cosa va de comunidades. Nadie inventa, construye o programa en solitario, sencillamente porque la complejidad de la tarea es tal que eso resultaría imposible.

La premisa de una comunidad que aspira a ser soberana es que el conocimiento debe ser compartido y los desarrollos individuales deben ser devueltos al común. El conocimiento crece con la cooperación. La inteligencia es colectiva y privatizar el conocimiento es matar la comunidad. La comunidad es garante de la libertad, es decir, de la soberanía.

La relación entre comunidades y conocimiento viene de lejos, no nace con las nuevas tecnologías. Por ejemplo, en una cultura en la que las mujeres sean las encargadas de atender los partos de otras mujeres, conservar y transmitir el conocimiento sobre la asistencia a los partos es fundamental para la reproducción de la vida. Esto hará que, más o menos formal o informal, haya una comunidad de mujeres asistentas de partos o, dicho de otra manera, entre las mujeres que asisten partos se darán relaciones comunitarias que tienen que ver con la preservación de los conocimientos prácticos. Si algún poder se plantea destruir esa comunidad (esa soberanía), una de las maneras de hacerlo es “destruir” el conocimiento que custodia la comunidad, haciendo que de repente aparezca como inservible, ridículo o anticuado. Y esto podrá hacerlo con políticas que “muevan” ese conocimiento a los hospitales y la medicina convencional. Si las parturientas van al hospital y son atendidas por médicos, la comunidad de mujeres se debilita o desaparece (pierde soberanía).

Dicho brevemente: la comunidad, en su versión radical, se autoorganiza y se autoregula con autonomía y es la garante de la soberanía. Si tienes comunidad tendrás libertad y soberanía. O más aún: solo dentro de las comunidades podemos ser personas libres y soberanas.

Y entonces dirás “pero yo, pobre de mí, que no tengo tiempo, que no tengo dinero, que de esto no entiendo nada, que ya tengo miles de problemas para salir adelante con mi vida... ¿cómo voy a meterme en una comunidad para hacer tecnologías?”.

“Meterse” en una comunidad no significa necesariamente saber programar ni ir a reuniones ni tener responsabilidades. Las comunidades son generosas. Permiten distintos grados de pertenencia y ofrecen distintos tipos de contribución.

Este libro intenta dar pistas sobre cosas que puedes hacer, y más abajo sugeriremos algunas de ellas. Pero hay una que es la más importante. No requiere tiempo, ni dinero, ni conocimientos. Solo voluntad.

Puedes colocarte en el ángulo desde el que se contempla todo el valor.

Siguiendo con el ejemplo, destruir la comunidad de mujeres que asisten partos supone que la percepción social sea de que ese conocimiento no tiene valor. El poder que quiera desarticular la comunidad de mujeres deberá hacer propaganda para desvalorizar el conocimiento de la comunidad y valorizar el conocimiento de los doctores del hospital. Y de la percepción social del valor, de lo valioso que es algo, participamos todo el mundo. Porque la decisión individual de una partera sobre ir al hospital y ser atendida por un doctor o parir en casa con la asistencia de otra mujer se toma en un contexto social que “juzgará” (valorizará) una u otra decisión como la más “buena”.

Estamos hablando no el valor económico, instrumental, empresarial o de marca, sino el valor social. Si contemplas el valor, estás dando y tomando valor.

Por ejemplo, aunque los hombres nunca vayan a parir, su visión sobre el valor de la comunidad de mujeres que se asisten mutuamente es muy importante. Si se colocan en el ángulo desde donde se ve el valor, están haciendo que la comunidad tenga más legitimidad, más soberanía.

Por eso, además de todas las cosas prácticas que puedas hacer, tu visión puede hacer que las comunidades sean más fuertes. Y ya estás contribuyendo.

Por qué es importante

Dice Antonio Rodríquez de las Heras que la tecnología es a la cultura lo que el cuerpo es a la vida.

Al igual que el cuerpo humano protege la vida genética (la “primera” vida), la tecnología protege la cultura, vida cultural que surge con el ser humano (la “segunda” vida).

Si el cuerpo humano, con su maravillosa complejidad, es una impresionante aventura de miles de millones de años que se inicia cuando una pequeña membrana, en la charca primordial, empieza a proteger el mensaje genético en los entornos más cambiantes, de la misma manera la tecnología se desarrolla y complejiza para proteger ese otro mensaje vital que nace con el ser humano: el de la cultura.

La tecnología, desde el fuego o la piedra de sílex hasta las prodigiosas construcciones que usamos, casi sin reparar en ello, por todas partes, es el cuerpo de la cultura. Sin tecnología no habría cultura.

La relación con la tecnología es paradójica. Te permite hacer más cosas (autonomía), pero dependes de ella (dependencia).

Dependes de quienes la desarrollan y distribuyen, de sus planes de negocio o de sus contribuciones al valor social. Y cambias con ella. ¿No está cambiado Whastapp o Telegram la cultura relacional? ¿No está cambiando Wikipedia la cultura enciclopédica? Y también la cambias a ella.

Por eso es tan importante sostener abierta la pregunta colectiva sobre qué horizonte tecnológico deseamos y cómo lo estamos construyendo.

Cómo valorarla

En el boom de las crisis financieras y de una cultura del emprendimiento obligatorio, la industria de las tecnologías, a la que no se le escapa la potencia de las comunidades, empieza a utilizar arquitecturas de participación para aprovecharse de la inteligencia colectiva y obtener valor de mercado.

Estas ofertas de mercado están todo el tiempo lidiando con otros estilos de cooperación, en un hervidero de tendencias que marca los episodios de la lucha por la soberanía tecnológica.

La industria de las tecnologías quiere naturalizar tus elecciones. Quiere que te adhieras a sus productos-servicios sin hacerte preguntas.

Así que, para resistir a la sumisión tecnológica te propongo que, en tus elecciones, valores:

Que la comodidad no sea el único criterio. Es más cómodo no separar las basuras. Es más cómodo coger el coche para ir a la vuelta de la esquina (siempre que tengas aparcamiento, claro). Es más cómodo comer comida rápida... Pero no siempre lo hacemos, porque la comodidad no siempre es el mejor criterio. Pues, con las tecnologías, lo mismo.

Que la gratuidad no sea el único coste. Está bien que haya servicios públicos gratuitos, que es una manera de decir que están costeados por todo el mundo, en un fondo común. También está muy bien intercambiar regalos, gratuitamente, que costeamos como un modo de mostrar agradecimiento y amor. Pero cuando hablamos de la industria de las tecnologías, la gratuidad es solo una estrategia para conseguir mayores beneficios por otras vías. Esa gratuidad tiene un altísimo coste no solo en términos de pérdida de soberanía (ya que nos quedamos al albur de lo que la industria nos quiera "regalar" en cada momento), sino en términos medioambientales y sociales. Guardar una foto en la nube, sin ir más lejos, tiene costes medioambientales y sociales, ya que para guardarla tiene que haber un servidor en marcha todo el tiempo, cuyos "motores" consumen energía eléctrica, etc., etc. Un servidor a quizás pertenezca a una empresa que no paga impuestos en el lugar en donde esa persona subió la foto y por tanto extrae valor sin contribuir al común, etc., etc. Todo cuesta algo. Por eso quizás deberíamos pensar en ese tipo de "gratuidad" como un coste que estallará por otro lado.

Qué puedes hacer

Nadie vive en una soberanía tecnológica absoluta. La soberanía es un camino. Pero no podemos aceptar eso de que, como no podemos hacerlo todo, no hagamos nada.

Hay muchas cosas que se pueden hacer. Por supuesto, puedes usar más software libre. En esta publicación encontrarás muchas propuestas de programas libres que funcionan perfectamente. También puedes participar activamente en alguna comunidad. Pero hay muchas más cosas que se pueden hacer:

Si tienes inquietudes respecto a tus prácticas tecnológicas, socializalas, convérsalas, hazlas circular. Las prácticas tecnológicas no son asuntos individuales. Tienen una dimensión social que debemos problematizar. Las tecnologías tienen que estar en la agenda común, tanto como la salud, el trabajo o la participación política. Hay que hablar de tecnologías.

Si participas en un grupo, no des por hecho que las demás personas están dispuestas a utilizar todos los programas de ordenador o todos los servicios de Internet que tú utilizas. Cuando participo en un grupo y, sin mediar más conversación, alguien propone hacer un Skype o un Hangout, me doy cuenta de que quien propone eso no tiene en consideración que pueda haber personas que no quieren abrir una cuenta en Skype o en Gmail. Es como si quisiéramos obligar a las personas vegetarianas a comer carne, porque para las carnívoras es más cómodo (o más barato, o más algo...) hacer un plato único con los criterios de una mayoría acrítica. Pero eso sería inaceptable ¿no? Pues, de la misma manera, alguien puede negarse a usar (o ser usada por) determinados servicios. Están en su derecho. La decisión sobre qué tecnologías usar no es solo práctica. También es ética.

Si eres educadora, transmite los valores del software libre. ¿Por qué tenemos que piratear lo que las comunidades ya nos ofrecen para compartir libremente? El software libre es el software que practica y defiende los valores de la comunidad. Si nos gusta la escuela pública, porque es la común ¿no debería gustarnos que en la escuela pública solo se usen programas de ordenador públicos, sin costes de licencia y sin mecanismo de privatización? Público no es lo mismo que gratis.

Si tienes capacidad de contratación (por ejemplo la web de tu asociación), busca empresas en la economía social que estén contribuyendo en las comunidades. El dinero que gastas en tecnologías ponlo en circulación dentro de los circuitos sociales comunitarios. En este libro encontrarás un capítulo dedicado a las cooperativas que recombinan la economía social y solidaria con la soberanía tecnológica. Esas

cooperativas se agrupan en redes de economía social o en mercados sociales locales. Y esas agrupaciones tienen webs en las que puedes encontrar empresas cooperativas a las que encargar un trabajo.

Si puedes programar actividades (en tu asociación, en el centro social, en el AMPA...), organiza charlas de sensibilización o talleres de formación sobre soberanía tecnológica. Esto es una tarea sin fin, que debe sostenerse en el tiempo, pues nadie nace enseñada. Si no sabes quién podría encargarse de dar esas charlas o talleres, acude a las empresas cooperativas. Ellas conocerán quien pueda hacerlo. Como hemos dicho antes, hay que hablar de tecnologías.

Si tienes prestigio o influencia, haz que la soberanía tecnológica sea un asunto relevante en las agendas políticas y críticas. Y si no los tienes, ponte al día leyendo las secciones que muchos periódicos ya tienen sobre tecnologías. Comenta con otras personas lo que has leído. Problematiza. Busca una perspectiva crítica y reflexiva. No se trata de perseguir la última tendencia del mercado, sino de estar al día en los debates políticos y sociales sobre soberanía tecnológica, que son muchos y constantes.

Si tienes energía o capacidad de liderazgo, promueve la creación de grupos para cacharrear, intercambiar conocimientos y disfrutar de lo tecnológico en compañía. Las tecnologías también son fuente de alegría y placer. Hay grupos que se reúnen para reparar juguetes electrónicos o pequeños electrodomésticos. Otras se juntan para hacer costura con componentes de hardware libre (electrónica). Otras hacen programación creativa... Las tecnologías no solo sirven para trabajar duro o para aislar a las personas. Como hemos dicho antes, son el cuerpo de la cultura. Y cultura es mucho más que trabajo.

Si eres mujer, busca a otras para preguntar, en común, cómo la construcción de género nos está separando de una relación activa, creativa y de liderazgo con las tecnologías. La presencia activa de las mujeres en la construcción de soberanía tecnológica es escasa. Ahí hay mucho trabajo por hacer. En este libro encontrarás algunas referencias, en las mujeres que han escrito algunos de sus capítulos.

Y, si no sabes por dónde tirar, busca ayuda. Además de toda la gente que conoces personalmente, hoy en día podemos entrar en comunicación con personas que no conocemos. Si ves un vídeo que te interesa o lees un artículo que quieres profundizar,

seguro que puedes poner un correo a su autor/a. Aunque no nos conozcamos, nos podemos ayudar.

Hemos editado esta publicación con la intención indagar en la diversidad, riqueza y situación actual de la soberanía tecnológica alrededor del mundo, para presentar sus potencialidades y dificultades.

Esperamos que te resulte interesante, que te la tomes en sentido crítico, y que nos ayudes a mejorarla y a difundirla.

sobtec2

Book: Technological Sovereignity, volume 2

Le code est politique, les algorithmes sont des armes mathématiques de destruction [1]

Benjamin Cadon

On en entend beaucoup parler, on ne les voit jamais, que sont ces algorithmes, ces bêtes invisibles et insaisissables qui se faufilent dans nos cerveaux et habitent nos poches? Quels desseins les animent?

D'un point de vu formel, un algorithme n'est qu'une inoffensive suite d'opérations alimentée par des données qui produit un résultat. Néanmoins, ils automatisent la résolution d'un ensemble de problèmes complexes [2] et certains sont ainsi devenus des Intelligences Artificielles élevées, grâce à des entreprises qui les gavent des données qu'on a bien voulu leur donner gratuitement.

Un bestiaire [3] d'algorithmes

Rien de tel que de savoir de quoi ils se nourrissent pour mieux les cerner et comprendre leur rôle dans la société des humains informatisés. Ils ne sont pas nés d'une étincelle d'électricité au dessus d'un océan de sulfureuses données. Leurs géniteurs sont des êtres humains qui écrivent des lignes de code pour réaliser un programme porteur d'un projet politique et sociétal dicté par un commanditaire privé ou public. Ces algorithmes ne sont jamais « neutres » et impartiaux et vont s'attacher à mener la mission qui leur a été assignée, souvent par des Occidentaux de genre masculin issus des classes supérieures bercées par le capitalisme.

Il faut aussi dire qu'un algorithme bête nourri avec beaucoup de bonnes données réussira toujours mieux qu'une intelligence artificielle affamée, et ce, même si elle a les griffes acérées.

Comment ne pas citer ces ogres américains que sont les GAFAM (pour Google, Apple, Facebook, Amazon et Microsoft)ou BATX pour leurs alter-égos de l'autre coté du Pacifique (les géants du Web chinois Baidu, Alibaba, Tencent et Xiaomi). Leur métabolisme est basé sur le fait de collecter, avec notre aide, un maximum de données sur nos moindres faits et gestes en « augmentant » notre quotidien avec pléthore d'applications mobiles et d'objets connectés supposés nous le rendre plus facile à vivre.

Qui mangent des données personnelles

Les algorithmes qui en résulte sont polymorphes. Ils ont tout d'abord grandi en nous regardant de loin, scrutant notre activité sur le réseau, les endroits que nous fréquentions le plus. Ils se sont ensuite élevés au-dessus de nos interactions afin de mieux déterminer qui faisait autorité, passant de la logique du vote populaire à celle du classement méritocratique. Dans un troisième mouvement, ils sont rentrés dans notre intimité numérique en analysant la qualité et la fréquence de nos échanges afin d'évaluer notre réputation et de traquer nos affinités. Enfin, ils se sont cachés au-dessous de notre regard pour mieux prédire le moindre de nos désirs, tout en œuvrant à les conditionner.

_	A côté	Au-dessus	Dans	Au-des
Exemples	Médiamétrie, Google Analytics, affichage publicitaire	PageRank de Google, Digg, Wikipédia	Nombre d'amis Facebook, Retweet de Twitter, notes et avis	Recommar Amazon, publicités comporter
Données	Vues	Liens	Likes	Traces
Population	Échantillon représentatif	Vote censitaire, communautés	Réseau social, affinitaire, déclaratif	Comporte individuels implicites
Forme de calcul	Vote	Classement méritocratique	Benchmark	Machine L
Principe	Popularité	Autorité	Réputation	Prédiction

4

D'après Dominique Cardon, « À quoi rêvent les algorithmes » [4]

Ces différentes générations d'algorithmes continuent à cohabiter et sont facilement reconnaissables car ils se montrent très efficaces pour nous rendre de nombreux services, si tenté que l'on paye notre « dividende numérique »[5], parce qu'ils discrétisent notre existence, la coupant en tranches aussi fines que possible pour en extraire toute information[6] monétisable.

Chaque État materne un ogre terrifiant qui œuvre dans le renseignement. Celui ci croise souvent ses intérêts avec ceux de ses amis ogres commerçants, en allant piocher sans vergogne dans leurs gardes-manger, et ce avec leur assentiment[7]. Son appétit insatiable le conduit à se tapir souvent là où transitent le plus de données. Supposé trouver un terroriste dans une botte de foin, il souffre pourtant souvent de myopie et d'obésité ,le rendant plus efficace pour chaparder des secrets des politiques et des industriels que pour cerner les méchants avant qu'ils ne passent a l'action.

Qui mangent des données publiques

Les différentes strates administratives de la force publique cultivent également des jardins florissants de données aux saveurs multiples : biométriques, fiscales, environnementales, urbaines, professionnelles ou encore liées à la santé.

D'apparence neutres et objectives, les bêtes algorithmiques publiques seraient la solution aux inégalités de traitement face au libre arbitre de certains fonctionnaires. Elles peuvent néanmoins métamorphoser des familles entières en insectes kafkaïens accrochés à la machine à écrire du film *Brazil*[8]. Ce sont elles en effet qui déterminent désormais où votre enfant doit aller à l'école, si vous pouvez bénéficier d'aides sociales, à quel travail vous devriez postuler, si votre cycle menstruel est prêt pour procréer.

Les commerçants de la donnée personnelle proposent bien volontiers leur aide aux collectivités publiques pour numériser et cloner les plus belles plantes du jardin public, qu'il s'agisse de fleurs culturelles ou d'herbes médicinales. Tous comme les commerçants, la force publique est passée de l'observation à la prédiction, elle peut non seulement optimiser le ramassage des poubelles, mais aussi envoyer ses forces de police là où un délit à le plus de chances de se dérouler grâce à ses algochiens PredPol CompStat ou encore HunchLab[9].

Qui mangent de l'argent

Thomas Peterffy est un financier qui s'est attaché à remplacer les courtiers et leurs opérations manuelles par des machines automatisées. En 1987, constatant que le nombre d'ordres passés par Peterffy était étonnamment élevé, les responsables des marchés envoient un inspecteur qui, là où il s'attendait à voir une salle des marchés remplie d'hommes blancs vociférants et suants, ne trouve qu'un ordinateur IBM relié au seul terminal officiel du Nasdaq[10]. Ainsi, en 1987, les algorithmes sont lâchés sur les marchés financiers.

Aujourd'hui, l'algotrading est généralisé, les clignotements algorithmiques feutrés des réseaux informatiques ont remplacé les traders hystériques, mais ces bêtes numériques de la finance se font déjà dépasser par les algotraders à hautes fréquences. Ces derniers se déplacent à la vitesse de la lumière, bâtissent des chemins pour arriver à l'ordre d'achat et de vente plus vite que les autres[11], engrangeant un bénéfice à chaque opération. Ils trouvent désormais abris dans les nombreux « dark pools » que les banques ont pu créer grâce à l'assouplissement paradoxal des réglementations. Dans ce confort lucratif qui connaît parfois tout de même des « Flash Crashs »[12], la diversité des espèces algorithmiques s'accroît (Blast, Stealth, Sniffer, Iceberg, Shark, Sumo, …[13]) de pair avec la complexité de leurs stratégies, rendant encore plus illisibles et incontrôlables les « marchés » pourtant supposés se réguler à grand coup de mains invisibles.

Tout ça impacte bien évidemment ce que l'on appelle « l'économie réelle » , c'est-à-dire la vie des gens. Par exemple, lorsque des pirates syriens compromettent le compte Twitter de la Maison Blanche et y postent un Tweet alarmiste qui est immédiatement lu par les robots algotraders, faisant ainsi plonger la bourse d'un seul élan de 136 Milliards de dollars en 3 minutes[14].

Dans la jungle de la finance, une nouvelle bête algorithmique est apparue sous la forme d'un ver qui se duplique dans tous les ordinateurs accueillants et qui grossit au gré de son utilisation, dévorant au passage une quantité impressionnante d'électricité[15]. On l'appelle la « blockchain »[16] et elle s'est fait connaître via le « bitcoin », la première crypto-monnaie dématérialisée qui se passe d'organisme bancaire central attaché à un Etat. Le bitcoin pèse aujourd'hui 28 Milliards de dollars[17].

Heureusement, des initiatives comme Ethereum[18] ont permis aux vers de muter pour ne plus seulement enregistrer que des transactions mais aussi véhiculer des bases de données et des applications « intelligentes » (les « smart contracts »). Cela donne des projets comme la DAO[19] (Decentralized Autonomous Organisation), un fonds d'investissement décentralisé sans directoire où chacun prend part aux décisions en fonction de son capital. Ce fonds s'est vite retrouvé garni par de multiples investisseurs, pour un montant de 150 millions de dollars. Néanmoins, un malicieux plaisantin a réussi à en soustraire un tiers en exploitant une faille (une fonctionnalité dit-il) du code qui est irrémédiablement gravé dans le corps du ver DAO hébergé par Ethereum. Faut-il couper les anneaux du ver malade ou le tuer pour en créer un nouveau ? C'est la deuxième solution qui a été adoptée pour que les investisseurs récupèrent leur pécule, après moultes discussions « politiques », alors qu'ils partaient du principe libertarien selon lequel « le code fait loi ». Ce qui soulève des questions juridiques importantes, notamment pour définir les responsabilités dans un réseau distribué[20] ou encore imaginer des formes de gouvernance de ce « code » qui supplante les lois des États dans certains domaines.

D'autres bêtes algorithmiques sont friandes d'argent et cherchent à remplacer les humains au travail, maximisant la productivité et les coûts, et contribuant ainsi à une plus grande concentration des capitaux. Les grandes entreprises l'ont bien compris et c'est ainsi que Foxconn annonce remplacer la quasi totalité de ses salariés par un millions de robots[21] ou que le cabinet d'avocats BakerHostetler embauche l'intelligence artificielle ROSS pour étudier plus rapidement les complexes dossiers juridiques[22]. La « mort du travail » est annoncée[23] mais le régime économique et social supposé le remplacer peine à poindre à l'horizon.

Qui mangent des cerveaux humains

Dernières familles identifiées dans notre bestiaire algorithmique, celles dont le fond de commerce est de remplir le cerveau humain et celles qui se chargent au contraire de l'aspirer pour mieux le remplacer. Les intelligences artificielles doivent se nourrir de bonnes données pour pouvoir supplanter les humaines dans un plus grand nombre de processus. C'est notamment ce que fait Google avec le projet reCAPTCHA[24],ces images illisibles qu'il faut décrypter et transcrire pour faire comprendre au serveur que nous ne sommes pas des robots mais bien des humains, on passe ainsi le test de Turing à l'envers[25]. La grande innovation avec reCAPTCHA, c'est que le fruit de vos

réponses nourrit directement les intelligences artificielles en suivant l'évolution des programmes de Google: décryptage de texte pour améliorer la numérisation des livres, identification des numéros de bâtiments pour affiner la cartographie et maintenant identification des images contenant des animaux ou panneaux de signalisation pour rendre le pilote automatique de la voiture moins myope. Cumulés, les résultats sont de plus en plus pertinents et représentent des millions d'heures de travail humain[26].

Quant à l'algorithme qui contribue à nourrir notre cerveau, il est, comme son collègue collecteur de données personnelles, de plus en plus élaboré et subtil. On alimente son cerveau quotidiennement à l'aide d'un moteur de recherche qui va nous indiquer le lien le plus pertinent, l'information la plus juste, la vidéo la plus emblématique. Début 2017, dans 92,8 % des cas cela sera Google. Cela en fait un dictateur culturel dans une position hégémonique tout à fait originale (mais que font les autorités de la concurrence !?). Ne pas apparaître dès la première page de résultat, c'est comme ne pas exister. Pourtant, l'algorithme de recherche de Google est jalousement gardé en tant que secret industriel et peut juste se voir opposer un droit à l'oubli[27].

Depuis la surréaliste expérience des chercheurs du laboratoire de Facebook[28], réalisée en 2010 sur 61 millions d'utilisateurs, pendant les élections du congrès US, on sait que le contrôle des messages de mobilisation politique a une influence directe sur le vote des personnes cobayes à leur insu, ainsi que sur celui de leurs amis et amis d'amis. Depuis, les fausses nouvelles ont abondamment chassé les bonnes sur les réseaux sociaux, venant grossir le flot de la post-vérité. De quel bord politique sont les algorithmes qui président l'affichage du contenu sur nos « murs »? Si l'on y associe trop rapidement la problématique des discours d'incitation à la haine et de harcèlement sur ces plateformes, cela place les algorithmes et leurs dresseurs en position d'ordonnateur moral d'une bonne partie de la société.

On pourrait croire que pour atteindre plus rapidement le point de singularité technologique[29], nos bêtes numériques tapies dans l'ombre s'ingénient à nous rendre serviles.

La gouvernementalité algorithmique[30] serait ce nouveau mode de gouvernement des conduites, fruit de glissements dans notre rapport à l'autre, au groupe, au monde, au sens même des choses, qui ont, grâce ou à cause, du tournant numérique, des répercussions fondamentales sur la façon dont les normes se fabriquent et fabriquent l'obéissance[31].

Quand un algorithme mange du cerveau humain, cela peut aussi provoquer la mort clinique de l'humain en question. Que dire des algorithmes qui pré-définissent des proies pour les drones tueurs, encore pilotés par des hommes et des femmes? Comment les algorithmes d'une voiture sans pilote choisissent le moindre mal / nombre de morts lorsqu'ils sont impliqués dans un accident qui va de toute façon en provoquer ? La cyberguerre plane sur nos prises réseaux, chaque pays affûte ses algorithmes pour être toujours plus sournoisement mortifère que l'ennemi.

Comment peut-on savoir si un algorithme est méchant ou gentil?

Méchant algorithme que celui qui a transformé des caméras de surveillance en armada de botnets sanguinaires qui se précipitent en masse pour étrangler les serveurs? Gentil algorithme celui qui me rappelle l'anniversaire de mes amis? Pas si simple de formuler des critères considérant l'interdépendance entre l'algorithme, ses données et les intentions qui l'animent. Néanmoins, on pourrait espérer qu'un algorithme sympathique répondent à ceux-ci:

- être « auditable » et donc constitué d'un code source ouvert et documenté
- être « ouverts » et donc manger exclusivement des jeux de données ouverts (« open data »), complets et « moissonables » par d'autres, dont on pourrait idéalement discriminer l'accès pour rendre payant certains usages commerciaux
- être « loyal et équitable », n'ayant pas la capacité de provoquer des discriminations ou des injustices (d'origine sociale[32], de genre[33], ...), de porter atteinte aux êtres humains[34]
- être « transparent[35] » et capable de réaliser des comptes-rendus systématiques de ses opérations et évolutions s'il est doté de capacités d'apprentissage ou de prédiction, être en mesure de subir des contrôles citoyens
- être « altérable » et pouvoir se prêter de façon légitime à des réclamations qui peuvent engendrer des modifications dans le fonctionnement de l'algorithme.

Dans cette quête de moralité algorithmique, il faut aussi évoquer les « portes », les API (pour *Application Public Interface*), qui permettent à ces bêtes numériques d'aller chasser des données sur d'autres serveurs et services que les leurs, ou au contraire d'aller y poser des contenus, des appâts.. On peut considérer que ces APIs sont les

pendants des brevets pour l'industrie, nouvelle forme de brevet logiciel anti open-source. Ces portes peuvent s'ouvrir et se fermer au gré des humeurs stratégiques de leur tenancier, ou se voir greffer un péage si le trafic d'un algo devient trop abondant, si cette monétisation devient opportune.

Dans la sphère publique et celle de la société civile, on peut imaginer que les critères antérieurement introduits d´ouverture, transparence, responsabilité, modificabilite soient respectés un jour. C'est plus compliqué à imaginer dans la sphère privée / lucrative, la donnée et les algos qui la consomme étant considérés comme « le pétrole de demain »[36] …

Ainsi, un groupe de chercheurs américains et des « gros » du numérique ont tenté de formuler des « principes pour des algorithmes responsables »[37] et se sont aussi réunis pour initier un partenariat sur l'éthique des Intelligences artificielles[38], très bonne manière de dire aux élus et citoyens préoccupés qu'ils « anticipent et gèrent » très bien cette complexité et qu'il n'est surtout pas utile de légiférer.

Pourtant, l'enjeu n'est pas d'exiger la transparence du code des algorithmes, mais celle de leurs finalités. Tant qu'elles ne se réduisent pas à de la communication commerciale, passer par la loi reste un moyen de coercition indispensable à déployer[39].Pour se réconforter, on notera le débat participatif en France, dans le cadre de la « Loi sur la république numérique » qui a conduit à instituer un devoir de transparence pour les algorithmes utilisés par la force publique[40], ou encore l'initiative « TransAlgo »[41] de l'INRIA qui vise à évaluer la responsabilité et la transparence des robots logiciels.

Futurutopies algorithmiques souveraines

Alors comment passer d'une bête algorithmique que l'on subit à un animal de compagnie que l'on nourrit? Compostons quelques lombrics pour dessiner les ramifications biotechnologiques qui conduiront les hommes et la technologie à vivre dans une harmonie de silice. Ou comment peut on reprendre en main nos destinées, notre autonomie mentale, notre souveraineté technologique aujourd'hui algopropulsées au firmament du contrôle social?

Le code est un objet politique, tout comme ce monde « numérique » grouillant d'algobots qui s'incarnent bien dans nos réalités.

En tant qu'objet politique, on peut donc s'y attaquer avec des outils classiques: militantisme et lobbying didactique auprès des pouvoirs publics, tentatives pour infléchir et abonder le processus réglementaire, valorisation d'initiatives concourant à donner plus d'autonomie et de bonheur aux êtres humains. Il peut également être opportun de revendiquer une place plus importante pour la société civile dans les instances de régulation et de normalisation de l'Internet, l'adoption d'un standard pour une technologie du réseau[42] étant par exemple l'équivalent d'un article dans la constitution d'un pays.

Au niveau individuel , il faut sans nul doute « dégoogliser » Internet[43], c'est à dire, à l'instar de ce que propose l'association Framasoft, s'appuyer sur des hébergeurs de services autonomes, transparents, ouverts, neutres et solidaires (cf. initiative CHATONS[44]), ou pourquoi pas s'autohéberger[45] sur un mini-serveur peu gourmand. On peut aussi tenter de se camoufler en utilisant le chiffrement de bout en bout, ce qui n'est pas toujours simplement adaptable et adoptable (PGP et les mails…) selon les cas de figure, on peut alors avoir recours au brouillage en tentant de noyer la « vraie » donnée dans des données factices mais crédibles qu'un algorithme complice nous fournirait en abondance.

Du coté des pouvoirs publics, il y a du travail, la voie de la transparence éthique est ouverte, il ne reste plus qu'à les y pousser fermement. Il faut certes adopter aujourd'hui une coupe de cheveux et un maquillage[46] bien étrange pour échapper aux systèmes de reconnaissance faciale[47], au fichage biométrique, à la mise en relation des bases de données publiques, et les dérives numériques de l'état d'urgence désormais permanent nous invitent à ne pas mettre tous nos octets dans le même panier.

On peut aussi tout à fait prendre le parti de nourrir ces algoIAs avec des étrons, à l'instar de ces utilisateurs de Twitter qui ont réussi en moins d'une journée à transformer l'IA de Microsoft TAY en sauvageonne sexiste, raciste pro-Hitler[48] … Imaginons plutôt élever de petits algoponeys qui viendrait déclamer, d'une ondulation de leur crinière arc-en-ciel sur fond de prairies verdoyantes de données, que « l'amitié c'est magique ! ».

Mièvreries mises à part, il faut peut-être également intercaler un intermédiaire informatique, un « proxy » entre nous, nos données, et les acteurs publics et privés qui les accueillent. Cet intermédiaire pourrait héberger confortablement Eliza[49], mon intelligence artificielle strictement personnelle qui se nourrit de mon activités et de mes préférences pour m'aider au mieux à partager mes données et contenus, en les anonymisant, en les donnant à des organismes publics dans une logique d'intérêt général, en les chiffrant ou les brouillant pour échanger avec mes amis qui n'arrivent pas à quitter les réseaux sociaux commerciaux. Distribuées dans la poche de chacun, les IA personnelles pourraient rentrer en symbiose, avec l'accord de leurs tuteurs, pour raconter à l'humanité des micro-fictions adaptées au contexte politique et culturel, afin de construire des réalités harmonieuses où cohabiteront en paix les algorithmes, les humains, la nature et le monde inorganique.

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[10]

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Rhyzomatica, red comunitaria de telefonia mobil

Chamaka

Una semilla brota cuando se siembra en tierra fértil

Esta es la historia de la telefonía celular autónoma y comunitaria de los pueblos originarios de Oaxaca, una tecno-semilla que habita un ecosistema comunal. Un puente ético-político entre la comunidad hacker del movimiento de software libre y las comunidades de pueblos originarios de Oaxaca, en el sur-este mexicano. Un diálogo entre el concepto de soberanía tecnológica y los conceptos de autonomía y autodeterminación, dónde el procomún y la decolonización se encuentran. Una versión de la historia del proyecto de telefonía celular autónoma y comunitaria que impulsó el colectivo Rhizomatica y que hoy gestiona la organización Telecomunicaciones Indígenas Comunitarias A.C.

Todo comenzó como un sueño que al nombrarse y compartirse se volvió realidad

Recuerdo que hace tan solo cinco años atrás, cuando hablábamos de la idea de crear una red de telefonía celular autónoma y comunitaria, nuestro círculo de amigos y amigas, habitantes en la ciudad, nos miraban con incredulidad. Sin embargo, cuando esa idea se conversó entre las montañas de la Sierra Juárez, en Oaxaca, en el seno de una radio comunitaria, todo comenzó a tener sentido.

Toda historia es un viaje en el tiempo y el espacio, y el punto de partida de esta historia es un gran cartel de bienvenida que dice así:

```
"En esta comunidad no existe la propiedad privada.
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PROHIBIDA la compra-venta de terrenos comunales.
Atentamente El Comisariado de Bienes Comunales de Ixtlan de Juárez".
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Antecedentes históricos acerca de Oaxaca[1], los pueblos originarios y “la comunalidad”

Oaxaca es el quinto estado más grande del país, con una población de 3 millones 800 mil habitantes, de los cuales mas de la mitad vive en localidades rurales de menos de 2,500 personas. De los 2,445 municipios que tiene México, 570 se encuentran en territorio oaxaqueño, y 418 se rigen por el sistema de usos y costumbres[2]. Es decir que en Oaxaca el 58% de la superficie total del territorio, es propiedad social de carácter comunal. En estas localidades, las autoridades están bajo el mando de la asamblea comunitaria, lo cual representa un ejercicio de democracia directa y participativa y una forma de autogobierno reconocida por la constitución política mexicana. En esta región conviven 16 pueblos originarios, siendo también el estado con mayor diversidad étnica y lingüística del país.

Además, Oaxaca es el estado con mayor biodiversidad, debido a que es una región geológica muy compleja, donde se cruzan tres cadenas montañosas extensas y profundas, la Sierra Madre Occidental, la Sierra Sur y la Sierra Norte, más conocida como Sierra Juárez. Debido a su accidentada geografía, los conquistadores europeos no pudieron someter completamente a estos pueblos, quienes pudieron conservar sus formas de autogobierno, que con el tiempo se han ido adaptando y reconfigurando al contexto actual.

A mediados de los años setenta y principios de los ochenta, entre los pueblos originarios de Oaxaca y el sureste de México surgió un movimiento social en respuesta a las políticas desarrollistas impulsadas por el gobierno y frente a la necesidad de defenderse contra el despojo de tierras, saqueo de recursos y desplazamientos forzados. Este movimiento demandó el respeto a sus formas de vida, sus idiomas y su espiritualidad. De esta forma construyeron y defendieron la autonomía y se construyó el concepto de "Comunalidad" como la forma de explicar la vida de estas localidades y pueblos. En aquellos años, constituyeron sus primeras empresas comunitarias de recursos forestales, embotelladoras de agua de manantial, proyectos de eco-turismo, comercialización y exportación de productos comestibles, además de

una multitud de radios comunitarias. A día de hoy, este movimiento social continua luchando por la defensa del territorio contra las empresas extractivistas mineras que quieren entrar en la región.

Estas luchas dieron vida a lo que la antropóloga Elena Nava llama las "teorías analíticas-nativas construidas desde abajo" donde pensadores indígenas como Jaime Martinez Luna (Zapoteco) y Floriberto Díaz Gómez (Mixe) buscaron entender la vida en comunidad más allá de las definiciones académicas occidentales. Estos pensadores se preguntaron: ¿Qué es una comunidad para nosotros los indios? Se trata de un espacio territorial de propiedad comunal, una historia común de carácter oral, un idioma común, una forma de organización propia y un sistema comunitario de procuración de justicia. A esto le llamaron "Comunalidad" como forma de ser, vivir y sentir, considerando a la tierra como madre, practicando el consenso en asambleas como órgano máximo para la toma de decisiones, generando un sistema de cargos basado en el servicio gratuito, desarrollando trabajo colectivo como acto de solidaridad y reciprocidad y la fiesta, los ritos y las ceremonias como expresiones de lo común.

Las radios comunitarias como empresas de comunicación comunal

En 2006, Oaxaca vivió un levantamiento social detonado por la represión por parte del gobierno al movimiento de trabajadores de la educación. Este movimiento dio vida a la Asamblea Popular de Pueblos de Oaxaca[4] y entre sus principales características fue la creación de varias radios comunitarias y la toma de los medios de comunicación estatales[5]. Algunas de estas se convirtieron después en Empresas Comunales de Comunicación[6] con el fin de reforzar la autonomía de las localidades y contribuir al alcance de los objetivos y visiones de vida de los pueblos originarios, es decir, su autodeterminación.

En 2012, más de 30 autoridades municipales y comunidades indígenas hicieron una petición formal a la Secretaría de Comunicaciones y Transportes (SCT) para reclamar el acceso a la frecuencias correspondientes a la banda GSM[3]. Sin embargo, la petición fue rechazada. El actual marco legal no obliga a las grandes compañías de

telecomunicación a proporcionar servicios de comunicación en localidades rurales de menos de 5,000 personas, aunque el órgano regulador del estado si se ve obligado a garantizar el servicio universal en entornos rurales.

La tecno-semilla

La creación de una red de telefonía celular autónoma se viene cocinando desde hace varios años dentro de la comunidad hacker del movimiento de software libre y han existido varios intentos previos para hacerla realidad. Por ejemplo, en 2008 surgió la idea de utilizar los teléfonos celulares en defensa de los derechos humanos y ambientales y para documentar los abusos que enfrentaban los pueblos originarios del sur de Nigeria. El desafío planteado por qué hacer con la documentación producida con los teléfonos celulares sin usar los servicios que ofrecen las empresas de telefonía, llevó a experimentar con un software (Serval Mesh) que permitía comunicarse sin pasar por la red de ninguna compañía. Esa tecnología no resultó adecuada para ese contexto. Nno obstante, esas inquietudes llevaron Peter Bloom, fundador de la organización Rhizomatica, a querer probar con un sistema de telefonía celular cuando vino a colaborar con la organización Palabra Radio en Oaxaca[7].

A principios de 2011, Kino, un hacker con experiencia en tecnologías para comunidades indígenas en resistencia inicia una investigación acerca de las necesidades tecnológicas para poder crear estas redes. Al mismo tiempo, la artista mexicana Minerva Cuevas[8], decide comprar un equipo pequeño de $3,000 dolares para crear una intervención político-conceptual en Finlandia, con ayuda de Kino, y luego dona el equipo para hacer las primeras pruebas. Luego, el abogado Erick Huerta, especialista en telecomunicaciones y pueblos originarios, conoce a Rhizomatica en un encuentro de comunicadores indígenas y se pone a investigar las implicaciones legales. En aquel momento, la organización Palabra Radio da soporte técnico a radios comunitarias, y es así como la idea llega a Keyla e Israel de radio Dizha Kieru (Nuestra Palabra) ubicada en el poblado de Talea de Castro, donde en 2013, nace finalmente la primera red de telefonía celular comunitaria.

Antes del lanzamiento de la red, Erick Huerta entabló un diálogo con el órgano regulador del estado para revisar la asignación de espectro y encontró un rango de frecuencias para GSM que no se estaban usando y que nunca se había licitado o

entregado a las grandes compañías. Esto permitió trabajar en un marco legal para que las comunidades pudieran operar sus propias redes de telecomunicaciones. En 2014, se obtuvo una licencia experimental por 2 años y en 2016 la organización de todas las comunidades que tienen redes de telefonía conformaron una asociación llamada "Telecomunicaciones Indígenas Comunitarias" (TIC A.C.), quien obtuvo una concesión social a 15 años para ser operadora en telecomunicaciones en 5 estados de México[9]. La asociación Telecomunicaciones Indígenas Comunitarias A.C. esta estructurada como una asamblea de comunidades. Esta sentó precedentes importantes a nivel nacional e internacional al desafiar el modelo comercial hegemónico de hacer telecomunicaciones y al considerar los ciudadanos no como clientes-consumidores sino como sujetos de derechos fundamentales, entre los cuales se encuentra el derecho a la comunicación.

Por lo tanto, estas redes de telefonía autónomas no explotan comercialmente los servicios que ofrecen y crean una cuota de recuperación para dotar la red de sostenibilidad. En la actualidad, esta cuota es de $40 pesos mexicanos (mas o menos $2 dolares) para cubrir los mensajes de texto y llamadas ilimitadas dentro de la localidad y las micro-regiones interconectadas. De esta cuota, $25 pesos se quedan dentro de la economía local para solventar los gastos de inversión realizada por la comunidad y pagar al proveedor de internet y los otros $15 se destinan a TIC A.C. para el mantenimiento de las redes y la realización de tramites legales.

¿Cómo funciona la telefonía celular comunitaria?

Una red de telefonía celular comunitaria es una red híbrida conformada por una infraestructura (software y hardware) y un servicio por internet que permiten que una comunidad pueda convertirse en prestadora de servicios de comunicación. El hardware consiste en un transceptor de señal GSM y un controlador o computadora operando con software libre conectada a la red de un proveedor de internet local y a la que se contrata un servicio de Voz por IP (VOIP). Gracias al trabajo de la comunidad hacker de software libre, Ciaby y Tele, dos hackers italianos, crearon los software (RCCN + RAI) que hacen que esta red funcione y cuente con una interfaz de administración sencilla.

Una comunidad interesada en crear su propia red de telefonía necesita también haber llevado a cabo un proceso colectivo de toma de decisiones dentro de la asamblea comunitaria. Se elabora una acta que autoriza el proyecto y se nombra un comité de operación y administración de la red que recibe capacitación por parte de TIC A.C. que a su vez tiene la responsabilidad de apoyar a las comunidades en la importación, instalación, capacitación y acompañamiento en asuntos legales, así como de gestión de sus propias redes. La comunidad debe proporcionar el lugar donde se hará la instalación, invertir alrededor de $7,500 dolares en la compra del equipo, su instalación y la capacitación. Algunas comunidades utilizan fondos municipales, otras realizan una recolección de fondos entre las personas del pueblo o piden un préstamo.

Beneficios y desafíos

Actualmente existen 15 redes[10] que cubren al rededor de 50 poblados y cuentan entre 2,500 y 3,000 personas usuarias. Se observa un promedio de 1300 llamadas al día de las cuales el 60% se dan dentro de la misma población o la región de la Sierra Juárez. Los principales beneficios de estas redes tienen que ver con facilitar la comunicación local entre residentes y a nivel micro-regional. Por otro lado, abarata la comunicación a nivel nacional e internacional gracias a un contrato con un proveedor de servicios de Voz sobre IP (VoIP), lo que disminuye los costos en un 60% en comparación con lo que cobran las compañías. Debido a la regulación, no se cuenta con un sistema de numeración para cada dispositivo conectado, por lo tanto, se contrata un número público que recibe las llamadas de fuera y a partir de un menú de voz, que en algunos casos esta en la lengua materna de la localidad, se teclea la extensión de la persona usuaria de la red.

Desde el punto de vista de las personas y las familias, se observa mayor comunicación interpersonal, se facilita la organización de la vida comunitaria y el trabajo compartido, la convocatoria a asamblea y el cumplimiento de las labores del sistema de cargos. También facilita cuestiones de seguridad y vigilancia dentro del territorio. Es útil en emergencias de salud o bien como sistema de prevención frente a los desastres naturales como plagas y tormentas. Finalmente, también facilita las relaciones comerciales y colabora en los procesos de producción al mejorar el acceso a más información y la comunicación con otras personas.

En cuanto a desafíos encontramos nuevas y antiguas violencias de género que se pueden reproducir a través de estas tecnologías y que han llevado a la la creación de un nuevo mecanismo de atención de estas violencias. Es ahí donde aparecen problemas ético-técnicos que van desde el almacenamiento hasta la entrega de información. La toma de decisiones respecto a estos problemas deben llevarse a debate dentro de la asamblea comunitaria y venir acompañado de un proceso participativo y de reflexión que tenga en cuenta perspectivas técnicas, políticas y éticas para que estos nuevos medios de comunicación pueden seguir existiendo sin perjudicar a las comunidades. Estas preocupaciones dieron pie a la creación del "Diplomado Comunitario para Personas Promotoras de Telecomunicaciones y Radiodifusión" y la creación de un Manual[11] y un wiki[12] para documentar la producción de conocimientos.

Soberanía Tecnológica y Autonomía

Ahora que ya presentamos el proyecto de telefonía celular autónoma y comunitaria, quisiera adentrarme en la discusión ético-política que marca el ritmo del diálogo entre la comunidad hacker del movimiento de software libre y las comunidades de pueblos originarios en Oaxaca. Quiero reflexionar sobre la pertinencia del concepto de soberanía tecnológica como enfoque político para el análisis de este tipo de iniciativa. No cabe duda que el proyecto de telefonía comunitaria es resultado de la construcción de un puente entre estas dos comunidades, construido sobre unas bases compartidas: el procomún y la descolonización. Sin embargo, el encuentro y el diálogo entre ambos no es fácil ya que para la comunidad hacker el punto de partida es la defensa y descolonización del conocimiento como un procomún, mientras para las comunidades de pueblos originarios en Oaxaca, ese procomún es el territorio de propiedad comunal, que también requiere ser descolonizado.

Descolonizar el territorio comunal implica entenderlo como un conjunto indisociable, que incluye al espectro radioeléctrico, ese bien común de dominio público, construido socialmente que permite a las comunidades fortalecer su autonomía. Para descolonizar el espectro radioeléctrico se requiere de tecnologías y de conocimiento. Es en ese punto donde se edifica el puente que encuentra a estas dos comunidades. Una vez que se encuentran comienza el diálogo y caemos en cuenta que el lenguaje también necesita ser descolonizado.

Mientras construimos este diálogo hemos observado que la visión hacker busca el procomún desde el individuo mientras que la visión de las comunidades lo hacen desde lo comunal. Este es el punto de quiebre que hace que para algunos hackers que han llegado a este territorio oaxaqueño resulte complejo entender la falta de libertades individuales que existen en la vida comunal, debido a que las personas no son seres divorciados en su relación con el todo. También hemos aprendido que no todas las palabras resuenan igual. Hemos encontrado que un mismo signo tiene diferentes significados y es en este mismo sentido que quiero exponer lo que ocurre con el concepto de soberanía tecnológica que nos invitó a participar de este libro.

Para que ésta tecno-semilla brotara hubo que situarse en un terreno fértil con historia y memoria, un ecosistema comunal del sur-este mexicano, un territorio que lleva siglos luchando por su autonomía y autodeterminación. Para los pueblos originarios de Oaxaca, el concepto de soberanía esta relacionado con la construcción del Estado-Nación que, a través de su constitución política (1917), buscó absorber a las figuras de autoridad comunales originarias, dentro de la estructura estatal, y en ese sentido repetía la experiencia colonial.

Hasta 1992 el estado mexicano no reconoció el derecho de los pueblos originarios a regirse por “usos y costumbres”. En 1994, cuando el movimiento neo-zapatista salió a la luz pública subvirtiendo la idea marxista de revolución nacional con una revolución por la autonomía, se reconoció a nivel mundial las reivindicaciones de autogobierno de los pueblos originarios del sur este mexicano con la creación y usos creativos y tácticos de las tecnologías de comunicación para estos fines. Para entender mejor esta última idea, volvamos al principio de esta historia, a nuestro cartel de bienvenida:

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"En esta comunidad no existe la propiedad privada.
PROHIBIDA la compra-venta de terrenos comunales.
Atentamente El Comisariado de Bienes Comunales de Ixtlan de Juárez".
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No se trata de una declaración de soberanía sino de autonomía. Aquí la construcción del poder no es desde la soberanía del pueblo, sino que es un poder que emana del territorio, ese bien común, donde no cabe la propiedad privada y donde las tecnologías tienen el papel de fortalecer esa autonomía, ese es el único mandato que debe respetar y defender la asamblea comunitaria.

Hasta aquí queda claro que nos estamos refiriendo al concepto clásico de soberanía y el significado que tiene en este rincón del mundo. Lejos estamos del concepto de soberanía tecnológica que postula el desarrollo de iniciativas propias, definidas por la vida en comunidad, como proceso de empoderamiento para la transformación social. En gran medida esta distancia se alimenta de la idea equívoca de querer fortalecer a las comunidades con tecnologías comerciales actuales para lograr una transformación social. Necesitamos seguir tejiendo saberes entre hackers y pueblos para descolonizar el concepto de soberanía tecnológica y ejercerlo desde la autonomía.

Es por esta razón que, cuando la comunidad hacker del movimiento de software libre propone entender estas iniciativas desde el enfoque de la soberanía tecnológica, no encontramos el eco esperado porque el significado es diferente. Aparentemente se trata de un conflicto aunque en realidad es un punto de encuentro: necesitamos descolonizar el lenguaje y como bien dice Alex Hache: "Entonces, si la idea se puede contar, también significa que puede ir calando en el imaginario social, produciendo un efecto radical y transformador".

Estamos en un buen momento de entablar un diálogo entre soberanía tecnológica y autonomía, entendida tal como se vive en este rincón del mundo, entre los pueblos originarios del sur-este mexicano.

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Simultaneous Interpreting Using Radio Frequencies

COATI – Colectivo para la Autogestión de las Tecnologías de la Interpretación

Introduction

> *"International solidarity and global protest is nothing new. From the European-wide revolutions of 1848, through the upheavals of 1917-18 following the Russian Revolution, to the lightning flashes of resistance nearly everywhere in 1968, struggle has always been able to communicate and mutually inspire globally. But what is perhaps unique to our times is the speed and ease with which we can communicate between struggles and the fact that globalisation has meant that many people living in very different cultures across the world now share a common enemy."* – Do or Die, Issue 8, 1999.
>
> *"Our resistance is as transnational as capital"* – Slogan of the global day of action against capitalism, June 18th 1999.

As the economy has become increasingly transnational, so too has resistance to its devastating social and ecological consequences. International resistance means coming together from different struggles and cultures to meet, share ideas and experiences, and coordinate actions. Crossing borders and cultures in this way means communicating across language barriers, and language is about power.

Many international gatherings take place in the more 'international' languages, such as English, Spanish, Russian or French. Many people speak these languages, but that is because they have long histories of imperialism: they were forcibly, and in many cases brutally, imposed on people from many different cultures, devouring local languages and eradicating cultural diversity. They can help us communicate, but they are often not people's first language, and people participating in a foreign language may be unsure if they have understood everything correctly, or they may lack confidence about expressing themselves well. Events are often dominated by people

who feel comfortable with the majority language; thus native speakers of colonial languages (particularly English) have dominated history and they continue to dominate our meetings.

If we are committed to diversity, grassroots participation or consensus decision-making, we must raise awareness of these power dynamics and processes of inclusion and exclusion. Increasing the equality of our communication and creating space for speakers of other languages is an important political struggle, and one valuable tool for dealing with this is providing interpreting between languages so that everyone can communicate in a language they are comfortable with.

Interpreting between two languages is an art as ancient as languages themselves and requires no technology. However, for interpreting to be practical in larger meetings in several languages it must be simultaneous; and multi-language, simultaneous interpreting cannot happen without technology.

A history of alternative interpreting technologies

The first attempt to use technology to facilitate this type of interpreting seems to have been at the Nuremberg trials after the Second World War, using a system based on the telephone [telephone]. Since then, the technology, usually based on infrared transmission, has developed alongside international organisations such as the UN and the EU. It is now very advanced but extremely expensive and out of reach for most activist spaces and social movements. Even if an event can afford to hire some equipment the costs soon become astronomical if you want to work at any kind of scale.

The European and World Social Forums (ESF and WSF) that took place between 2001 and 2010 were international events on a massive scale, with up to 100,000 participants and hundreds of parallel meetings taking place every day. Initially, interpretation was very limited, due to costs, but some people quickly realised the importance of languages to the political process, and Babels, a network of volunteer interpreters, was born.

Interpreting and interpreting technology became part of the political process. Interpreting is easiest in large plenary sessions where a few people speak and most just listen. Participatory organising requires working in small groups, where more people have the opportunity to contribute, but this multiplies the interpreting resources required, so decisions about interpreting affect the working dynamics of an event. The prohibitive cost of commercial technology and interpreters limits available resources, and there is no such thing as a purely technical choice. Even if there is money to pay for the service, it is a one-off thing: you give it to a commercial company and it is gone. The alternative is to "Do it Yourself", invest in people and equipment and thus increase the capacities and autonomy of the movements.

At the 2003 ESF in Paris, over 1000 volunteers took part in the interpretation, and every plenary and workshop took place in several languages. However, the technology used was commercial, and the costs were astronomical. Full-scale, commercial interpreting technology has never been used again in an event of that size. This inspired the first experiments in alternative interpreting technology. Initially, these were based on computers, but digitalisation introduced long delays that confused interpreters and public alike. At the 2004 WSF in Mumbai, India, computers were abandoned for more low-tech, analogue solutions, transmitting through cables and via FM radio. In Greece, a collective known as ALIS (ALternative Interpreting Systems) was formed to provide interpreting technology for the 2006 Athens ESF. Using the blueprints and building on the experiences of earlier groups using analogue interpreter consoles and FM radio transmission, they spent months building enough equipment to cover the entire event.

Athens was the first (and for Social Forums sadly the only) time that a large political event fully recognised alternative interpreting technology as a political question in itself and gave it the space and resources necessary to carry out its mission. The result was an unprecedented success. Infrared receivers are extremely expensive devices, jealously guarded by their commercial owners who require participants to deposit a passport or credit card in exchange for their use; but in Athens interpreting was made available to anyone with an FM receiver, and versions of that system are still being used by social movements today, allowing people access to interpreting through any household radio or smartphone.

Nevertheless, despite the success of Athens, the experience of working with the Social Forums was generally that the best efforts of interpreters and technicians were rendered completely ineffective by inadequate political and technical support at the events. Furthermore, there was no support at all between events, when equipment had to be bought or built, stored, transported, tested and repaired. Unlike commercial equipment which you rent for the duration of an event, self-managed equipment remains with you between meetings, and in greater amounts than any particular event may need. People have to be trained in how it works, logistical issues need to be solved and there are administrative loads to bear, all of which requires resources and dedication. The Social Forum process refused to learn that lesson, but other movements have taken it on board.

COATI: The Collective for Autonomy in Interpreting Technology

COATI was formed in Barcelona in 2009, bringing together people who had participated in anti-capitalist and anti-globalisation movements. We had supported the peasant farmers of Via Campesina in the creation of the movement for Food Sovereignty, and had volunteered as interpreters (sometimes in very precarious conditions) and seen the value of good alternative technology; we had learnt to organise horizontally and by consensus in the Do-It-Yourself culture of anarchist and anti-capitalist social centres all over Europe; we had built an understanding of technology in the squatted hacklabs and free software communities; we learnt about sound systems running hardcore punk festivals, street parties and independent, community-based radio stations; and it was those experiences, and the values of those communities, that inspired the project.

We invited someone from the original ALIS collective to come to Barcelona and train us in how their equipment worked, and we began to track down as much of the old alternative technology as we could find (most of it was piled up in warehouses, or in forgotten boxes in campaign offices, gathering dust). Our commitment was to increasing linguistic diversity and our plan was to acquire and manage the equipment,

so that each event didn't have to solve its technology problems from scratch. However, we quickly learnt that increasing access to interpreting technology was going to require more than just administering the equipment and reducing the costs.

Making alternative technology work for people

The first challenge was to overcome resistance to using alternative technologies, often born of bad experiences people had had with the equipment in the past. Designed within the social movements, the system did not match the quality of commercial equipment. It was built with the aim of drastically reducing costs, using cheap material not specifically designed for audio, and interpreters and public alike could be plagued with an electronic buzzing noise that was exhausting to listen to for any length of time.

An important part of the solution was simply treating the technology as an important issue. We trained ourselves, and wherever our equipment went there was always a dedicated person responsible for operating it (many of the problems of the past were caused by alternative technology being treated as an afterthought, and no one having the time to ensure it was working well). We learnt as we went along and devoted a lot of time to identifying the causes of problems and modifying the equipment, adding small circuits to filter and boost signals, and improve the quality of the sound.

This was made considerably harder because the material built by the Greek collective came with no schematics. This meant hours of reverse engineering were required before we could make modifications. Now, the equipment is almost 10 years old and we are beginning to face the challenge of designing and building new, open-source consoles from scratch. We are very aware of the value of open-source design, and all of the electronic work we have done is fully documented and available online [online].

Making people work with alternative technology

Overcoming technological problems was not the only challenge we faced. Some of the most difficult issues stemmed from the political and organising cultures of the movements themselves. Many groups are based on relatively informal organising and people can be resistant to the discipline simultaneous interpreting requires: people must speak slowly and clearly; use microphones so that the signal reaches the interpreters; and people cannot interrupt each other. Larger networks and NGOs may have more experience of working with interpreters, but they tend to treat it as a mere technical service that should be invisible and not as an important part of the political process. They get frustrated with the demands of solidarity interpreting and alternative technologies for participation and political involvement. However smoothly the technology is working, just having interpreting does not automatically eradicate the power dynamics created by language, and it must be everybody's responsibility to create space for more minority languages.

Another important part of the work done by COATI has therefore been working to promote the political culture that alternative interpreting technology needs to really work.

Volunteer interpreting

Alternative technology can be used by commercial interpreters, and volunteer interpreters can work in commercial booths. However, in practice the two processes have developed very closely, side by side, and a key element of organising an event is often finding volunteers with the necessary skills to meet the language needs. You can deal with this by finding professional interpreters who are willing to work for free, either out of solidarity, or simply because they need work experience, or because travel and expenses will be covered to exotic places. However, this relationship risks becoming one of cheap service provision, with volunteers having little interest in the political issues being discussed; and the resulting expenses can be high even if the work is done for free.

A large part of our work is therefore helping movements to build the capacity for simultaneous interpreting within their own grassroots. The larger an event is, the more complex this process becomes and a whole article could be written just on the political and technical questions involved. Suffice to say it is a very important issue.

We have developed a two-day training for activists with language skills, and we always try to incorporate skill sharing in the interpreting teams we coordinate, putting experienced interpreters together with new activist volunteers in our booths.

Speaking for interpreters

Another important part of changing the political culture has been to raise the profile of language diversity among participants in international events. Wherever we work we try to give a political and practical introduction to the equipment, and provide written guidelines on how to speak in multi-lingual meetings multi-lingual. We encourage people to actively think about the language they use, for example, asking them not to speak the majority language in a meeting even if they can, because it marginalises those who have to rely on the interpreting, leaving them feeling embarrassed and uncultured and less inclined to take part. We have experimented with subverting the invisible interpreting model, placing the booths centre-stage and having speakers speak from the floor, thus making everyone aware of the processes involved.

Designing flexible solutions to meet political needs

Interpreting inevitably does impose limitations on what a meeting or gathering can do, and simultaneous interpreting is best suited to quite hierarchical forms of organising such as the traditional conference model. However, we are committed to non-hierarchical organising, and we make it a priority to understand a group's methodologies, needs and resources and match them to the technical and technological possibilities.

There are two main parts to this process. One is to work closely with event organisers to understand their political aims and help them to understand interpreting and interpreting technology and how they interact with different kinds of facilitation techniques and meeting dynamics. The other is to take a creative approach to the

equipment, building little hacks using mixers and splitters, and wiring (or sometimes gaffer-taping) devices together in unconventional ways to make them do what we need.

We have built up a wealth of experience of pushing the boundaries of what can be done to break the mould of the typical meeting format, even in quite extreme circumstances. At the Second Nyeleni Europe gathering in Cluj-Napoca, Romania in 2016 we organised interpreters and equipment to work with experimental participatory methodologies with over 400 participants in more than nine languages, and we are now working on a technical and political guide to facilitation with multiple languages.

The biggest challenge: Decentralisation

Over the past seven years we have worked with many groups and movements to help solve the language requirements of their international events. Very often this means us providing all the necessary technology and technicians, and coordinating the volunteer interpreters for the event. However, we also collaborate in mixed solutions, and help organizations to build or acquire their own equipment and build the capacity to meet their interpreting needs. We believe that real technological sovereignty means that groups don't have to rely on 'experts', but become empowered to meet their own technological needs. One of our biggest projects has therefore been the development of simple, easy to use, build-your-own open-source hardware.

The Spider: An open-source hardware project

The simplest form of interpreting technology is probably the “Spider”: a small box you plug a microphone into, with sockets for headphones to take the interpreting to the public via cables, making it look like a big, lanky spider!

Compared to FM radio or other wireless transmissions, Spiders are cheap and very easy to operate. Spiders are a small-scale device, only really suitable for smaller meetings (although in extreme situations we have used them at events with hundreds

of participants!) The real scalability of the project lies in the fact that any organisation can have a few, making them completely autonomous for many of their interpreting needs.

Years of experience went into developing and producing our own open-source version of the Spider, with many improvements such as modular extensions you can use to add listeners in groups of up to twelve.

We build our Spiders by hand for our own use and for sale; and also sell make-your-own kits at cost price. All the schematics, parts references and complete building instructions are published online online under the GNU General Public License.

Training new tech collectives

Since the Spider project went online we have run a number of electronics workshops, training people to build their own spiders, and we know of at least one group, in Ukraine that has built Spiders without any contact with us. We also work with technicians from other groups, inviting them to join us at large events and see how the technology works in the field; we have taken part in a number of skill-sharing weekends, helping new groups to get started; and we have participated in the creation of new collectives using Spiders and inventing their own interpreting solutions in Romania Romania and Poland Poland as well as an international collective, Bla Bla, that has Spiders and small radio kits that travel to different events around Europe.

Conclusions

Sovereignty in interpreting technology has come to mean many things to us. In the first instance, to extend access to interpreting technologies to resistance movements it was necessary to reduce the costs, and develop high-quality alternative solutions that really work and are sustainable in the long-term. However, that was not the only challenge. A lot of political work still needs to be done to overcome people's resistance to using interpreting technology to open our meetings and gatherings up for speakers of other languages to participate on an equal footing. There is a need to share skills and knowledge about the technical aspects of interpreting and how those can interact with different kinds of facilitation dynamics; and open-source research and

development that aims to maximise technological sovereignty must be accompanied by capacity building and political mobilisation, to increase people's awareness of why and how they should use the technology, and empower them to really control and create their own solutions.

For more information about COATI and the work we do please see:

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Whistleblowing, a friendly double edge sword

Whistleblowing is an ancient practice that has been called many names and is not ethically bound. It can be the link between the source and the journalist, or between the snitch and the military. In both cases, a reserved information goes in the hands of a person considered trustworthy, which transforms this information into an action. Wikileaks and Snowden have made whistleblowing come back full powered, showing how digital communication can simplify the process and protect the integrity of communications between sources and recipients. Anonymity and encrypted storage technologies have propelled this, revolutionary, framing.

I say framing because whistleblowing does not have an ethical value per se, what identify its nature is the political cause motivating it. So if you are a single person going against a powerful organisation, like the US state department, the intelligence community, the financing system, or the Vatican you might be remembered for your heroic behaviour, like Chelsea Manning [1], Bill Binney [2], Herve Falciani [3], Paolo Gabriele and Claudio Sciarpelletti [4]. Becoming famous in this field often means you have been caught, denounced or that you are in the run, hopefully those outcomes do not apply to all whistleblowers as we will see.

Your informations can empower the citizen in understanding the power dynamics in play, but institutions themselves can also take advantage of those. If the ultimate goal of whistleblowing is making society more transparent in the interest of society itself, this might sound fascinating if you want a revolution, but it can be also very irresponsible for other reasons. Nobody really wants a society in which everyone can be a spy or an anonymous snitch.

This society would just strength the currently established institutions in power. Regimes in which a person can be economically rewarded for snitching on other citizens exemplifies this misuse. Added to that, any structure with some type of power, even your small NGO or political team, benefit of agreements and contracts which are kept private because they require some level of confidentiality. No resistance without well kept secrets is possible.

Transparency for the State (or for "who has enough power to shape our reality") and privacy for the rest of us? This could work as a nice simplification, but then we should respect this separation in all our political actions and never, ever, expose any private information of other citizens.

I worked with the globaleaks.org team on the creation of its software platform. Our dream, was to create a "portable wikileaks" that could be unleash in every city, media and public company. After all, white collar crime and other corporate misbehaviour can't be detected neither understood without an insider. My experience comes from deploying it for different groups with different needs. Departing from the made up story below, will see how digital whistleblowing can enhance your political actions and what you should take into account when planning your leak initiative.

Once upon a time...

There was a river getting heavily polluted. Some facility operates nearby and it is clear they are disposing chemical waste. There are rules, periodic checks, policies, but at the end of the day, flora and fauna are getting poisoned. Someone inside must know, but you don't know anybody who works at the facility.

Your team creates a campaign and solicit sources, but criticism starts because your wordpress blog to receive the leaks has not strong security properties. Therefore you set-up a proper platform (SecureDrop or GlobaLeaks [5]) that can guarantee anonymity for the source, and encryption for the information exchanged. Even a seizure of the server can't compromise the security of sources nor your active investigations. This is a privacy by design setup. However despite the platform pick, you know that your initiative is shaking some established power and you fear retaliation. You develop a mitigation plan based in splitting responsibilities among a larger group composed by environmental lawyers, local journalists and some foreign analyst which also receives the leaks. This way, if a person get stopped, the initiative will keep running. However, despite all this security management, after two months you have received zero leaks.

Sadly, we are closed in our bubble, our circles. We communicate to our intended audience and despite our efforts at the end of the day we talk only to persons similar to us. So, nobody working at the facility was in your comfort zone. You've to hunt these

sources, advertise them personally or massively. In the beginnings, nobody understand why your cause is important. Then you re-frame your message making clear why it matters for the environment, why their role is important, and after some weeks, the first timid source might arrive.

This is just the beginning and when the first article is published, you know this story will be read by facility employees because they talk about their company. And then you explain again why their role matters, how they can send anonymous tip-off, that they are not the first and can do it safely. Gradually, step by step, gaining trust from persons with different values and knowledge, you are getting the flow of information that might be transformed in political outrage, strength, actions. After a while, society takes action and the facility has to take responsibility for its environmental impact.

This example can take place in different contexts in which abuses happen. But let's see if all the outcomes of leaking are positives and correctives or if they can be damaging as well?

Practical steps

Suppose you are lucky enough to receive an anonymous document detailing a lobbyist plan to influence the new policy about environmental preservation. The first urge might be to publish it immediately. Let citizens make their own mind, and check if the information contained in the document fits their own knowledge. Some readers might confirm, deny, or integrate new information within the original source.

But this is not journalism and it is not information, it is just a naive action of disintermediatied radical transparency. Ten years ago, WikiLeaks used to work that way. It was a platform in which sources could upload documents and have other readers perform its analysis, investigation and publication. In 2007, it could be comprehensible behaviour, but when Buzzfeed [6] does the same 2017 publishing an invalidated report about Russians and Donald Trump.

Such release method are dangerous and extra tempting if you are operating in the information ecosystem. Messages speed do not let persons evaluate the information in its context, neither understand how much of it is plausible and which are the parties involved. Nowadays only the title, the subtitle, and maybe for a small

percentage, the actual content is actually spread. It is impossible to ask for a public revision and when unvalidated news get viral, the effect is to split the audience in two polarized groups.

Trust is key because a leak might not lead to changes. It can be ignored, silenced, accepted as daily life. An anonymous document should be published, but it is expected a trustworthy person, such as a journalist of mainstream media, visible activist or human rights defenders states: *"I know the source, I vouch for the source, I'm protecting the source"*.

Leaks are information you might use as accountable tools for transparency. They can also be legit tools integrated within civil society investigation, which results can be considered as part of the academic, scientific and political communities. Bringing changes is not something that can be implemented in technology. On top of technically defined properties, you need to implement your political and ethical values.

Whistleblowing powered campaigns as processes.

The best validation method we saw so far, is to only spread leaks validated by independent investigation. If the investigation hasn't lead anywhere, then the leak has to be considered not valid.

To do so, you might also need to interact with the source. Luckily, platforms permit to comeback to them and confirm their submission, provide updates, or answer to questions raised during the investigation. If on one side you ask for more details, in the other, you will still have to evaluate the proofs until you don't fully trust the source. Publishing a leak without understanding the agenda and motivations of the source can mean to be instrumentalised by it. Take in mind that leaking has been used many times for organising smear campaigns.

Having among the recipient trustworthy partners helps greatly the initiative too. It ensure the revision, source management and outreach will not be only done by one group, but will be shared through partnerships with local lawyers, journalists, policy maker, researchers. Then your group has to transform investigated and validated leaks

into stories. Passionate and understandable stories to engage persons and create mass mobilization. Think about the process applied to Edward Snowden leaks where for three years now there is constant journalistic revision and gradual publications.

One key factor for a successful campaign is to remain focused on a subject, a topic, a challenge. Do not vaguely call for evidence about corruption at large. Frame your specificities in your landing page and targeted towards your audience. There should be also a specific promotion of the validated contents. And every time you have the opportunity to write for a media, remind to the readers that a safe box for tip-off is available because articles are generally read by the persons implied in the subject.

It is useful to measure what is happening as much as possible. Keep track of the event and monitor its social media presence in order to understand how to improve your campaign based on results collected earlier. By sharing these measurements, you will help other initiatives like yours. Don’t be afraid of your enemy and keep building open data on how your organisation works. Do not address the people, but the numbers, concentrate on the results, achievements and statistics.

Dangerous paths you should be cautious with

An initiative has a time window of existence, it has to define what it is aiming for, what is its next milestone and how it is going. Having unmaintained initiatives might confound future potential sources. If your activity stops, make it very clear, because nothing sounds more sketchy and worrying then a whistleblowing initiative that receive your tips and don’t answer back.

Putting a source at risk is irresponsible, and this can happen if a story contains too many identifiable details. Files need to be sanitized and metadata need to be cleaned, but you also need to ask the source about how many other persons got access to the same information. Depending of the amount (two, twenty or two-hundreds) aware of the same secret, different justification will need to made up.

It is easy, when you're part of a conflict and you are facing an adversary, to assume that all the persons collaborating with it are your adversaries too. That's is a dangerous path. Do not aim at leaking personal information about “low-rank”

workers for instance because you might just expose innocents to responsibilities they don't own. Just imagine if similar actions were used from an established power to treat a minority or a marginalised group. If you are looking for social justice, having spread whistle-blowing as a way to solve political struggles might just backfire against your agenda.

Attacking an individual is a fascist behaviour, and it has to be stigmatized despite the political reason sustaining the initiative. What has to be exposed, is the corruption of a system, not the misery of life. Whoever do the release has the mission also to protect low ranked individuals from public exposure. Otherwise, whistleblowing will just enable a "Kompromat" [7], a set of information that might embarrass someone or be used for blackmailing individuals. Every faction in play can make use of it, so it is better to share strong ethical values in order to judge the democratic quality of initiatives.

In theory, a whistleblowing initiative is intended to empower a weak group to shed lights over a secretive oppressive organisation. But what defines power, oppression and secrets depend of contextual and subjective evaluations and thus can be rarely used as an assessment and evaluation criteria.

As a conclusion, I really believe whistleblowing can address and make good use of a lots of disgruntled employee and ethical remorse that some ex-workers experienced. Being able to empower these voices and transform their stories in changes, is a vector of leverage we have to explore maybe now more than ever.

Success cases of GlobaLeaks adoption

Interesting experiments has been created by communities around the world since 2012, the GlobaLeaks team is keeping track of a list [8] but some of the most notable, are the submissions collected by WildLeaks, a platform against animal poaching [9], the Italian Investigative Reporting Project Italy collecting pieces of evidence from public officers on Couch-surfing raping his guests [10], I mention this just because the corruption cases at too much. The Spanish X-Net [11], able to prove bankers bankrupt and state accomplishment and made a theater play out of it. PubLeaks, participate by the biggest Dutch media, who made a book with all the revelation received in 4 years,

12

and MexicoLeaks [12], apparently so frighting to have journalists fired even before the leaks begin to flow. And now is up to you. What's the pandora's box you want to open?

References

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Développons l'informatique paysanne, élevons des chatons

Introduction

Ces dernières années, nous avons constaté une centralisation des usages du net entre un nombre très limité de fournisseurs de services en ligne incarnée par les désormais bien connus GAFAM (Google Apple Facebook Amazon Microsft). Cette concentration, complètement contradictoire avec les origines d'Internet pensé de façon décentralisée et distribuée[1], a poussé Tim Berners Lee, le créateur du web, à formuler des propositions pour son avenir[2]. Alors pourquoi faut-il s'en préoccuper ? Tout simplement parce que les données, et particulièrement nos données personnelles, constituent le carburant économique de ces gros acteurs, et qu'une telle accumulation d'informations à notre sujet leur confère un pouvoir immense, nous transformant en « produits » grâce à leur services « gratuits ». Les enjeux autour de ces questions sont au final multiples et complexes : surveillance généralisée, intelligences artificielles alimentées par le « big data », fin de l'anonymat et de la vie privée, liberté d'expression et d'accès à l'information endiguée, censure ou pertes de données suite à la fermeture d'un service… Fort heureusement, une bande d'irréductibles gaulois réunis autour de l'association Framasoft[3] a vaillamment entrepris de « dégoogliser » Internet[4] et d'essaimer cette initiative pour que nous puissions « reprendre le contrôle »[5].

Les dangers

Espionnage

Sous le prétexte de fournir une « meilleure expérience utilisateur », nos comportements sur Internet sont espionnés en permanence. Ces informations peuvent servir à afficher de la publicité ciblée, mais les révélations de l'affaire Snowden ont aussi prouvé que les géants de l'Internet étaient contraints de

communiquer ces données (parfois extrêmement privées : emails échangés sur GMail, photos partagées sur Facebook, conversations Skype, géolocalisation des téléphones, etc.) à des services gouvernementaux. Sous prétexte de lutter contre le terrorisme, les États sont aujourd'hui capables d'obtenir bien plus d'informations qu'un « Big Brother » ne l'aurait jamais rêvé.

Vie privée

Nos données sont une extension de nous-mêmes. Elles peuvent indiquer où nous sommes, avec qui, notre orientation politique ou sexuelle, les sites que nous avons visités, notre recette préférée, les sujets qui nous intéressent, etc.

Si une donnée seule, prise indépendamment, n'est pas forcément sensible, un ensemble de données peut le devenir (par exemple si vous avez fait des recherches sur le cancer avant de souscrire à une assurance-vie).

Dans un monde où tout devient numérique (lecture, TV, téléphonie, musique, réseau social, objets connectés etc.), notre vie privée est un élément essentiel de ce qui fait de nous une personne singulière. Une personne malveillante qui aurait accès à votre smartphone peut en apprendre suffisamment sur vous en quelques minutes pour vous causer des torts très importants (usurpation d'identité sur Facebook, détournement d'informations professionnelles, achats effectués sans votre accord, etc.).

Centralisation

Les acteurs majeurs de l'internet sont devenus de véritables pieuvres : Facebook possède WhatsApp et Instagram, Google détient Youtube et Waze, Microsoft distribue Skype, etc.

Cette concentration des acteurs pose de multiples problèmes : que se passera-t-il si Facebook met la clé sous la porte ? Comment faire des recherches si Google subit une panne ? Nous devenons peu à peu dépendants de services fournis par un petit nombre d'acteurs. Par exemple, Apple (iPhone), Google (Android) et Microsoft (Windows Phone) se partagent la quasi-totalité du marché des systèmes d'exploitation pour smartphones.

Par ailleurs, la taille de ces acteurs bride l'innovation : difficile de lancer une start-up face à Apple ou Google (respectivement première et deuxième capitalisations boursières mondiales).

Enfin, le manque de diversité de ces géants leur donne aussi la possibilité non seulement de collecter facilement des informations personnelles, mais aussi d'altérer l'information qu'ils diffusent (une recherche Google sur le mot « nucléaire » n'affichera pas les mêmes liens suivant que Google vous perçoit comme un militant écologiste ou un pro-nucléaire).

Fermeture

Les services web affichés sur votre ordinateur ou votre smartphone sont généralement exécutés dans le « cloud » : des serveurs dispersés sur la planète, stockant à la fois vos données (mails, photos, fichiers, etc.) mais aussi le code des applications.

Pour les données, cela pose le problème de leur pérennité (que deviennent vos fichiers si Dropbox ferme demain ?) mais aussi de votre capacité à changer de services (comment faire pour récupérer l'ensemble de vos photos sur Facebook ou Picasa, et les réinsérer avec les commentaires dans un autre service ?).

Pour les applications, cela implique que vous êtes à la merci de changements impromptus selon le bon vouloir du fournisseur (ajout de publicité, modification de l'interface, etc.), mais surtout que vous n'avez quasiment aucun contrôle sur ce que l'application peut faire. Ce sont des « boîtes noires » qui peuvent agir de façon malveillante (envoyer des SMS à votre insu, exécuter du code indésirable, etc.).

Bref, ces sociétés nous enferment dans des cages dorées, certes, mais des cages malgré tout !

Dégooglisons Internet

Framasoft, à travers l'initiative « Degooglisons Internet », souhaite faire face à ces dangers menaçant nos vies numériques en proposant des services libres, éthiques, décentralisés et solidaires. Ils dressent ainsi une liste des services et logiciels

privateurs les plus couramment utilisés en mettant en regard des logiciels libres correspondant à ces usages et les services qu'eux mêmes proposent[6].

En 2017, une quarantaine de services en ligne est proposée gratuitement aux internautes afin de couvrir une variété d'usages : stockage de fichiers de type « cloud » personnel, agenda, contacts, édition collaborative de documents, visioconférence, cartographie, carte mentale, réunion et sondage, liste de diffusion, réseau social, livres en ligne, moteur de recherche, jeu éducatif, gestion de projets… La liste est longue mais « la voie est libre ».

Liberté

L'histoire d'Internet elle-même est une histoire de logiciels libres, tant du point de vue des standards que des protocoles employés. Sa popularité et son potentiel font aussi des envieux, et de grandes entreprises aimeraient s'en attribuer le contrôle en imposant du code fermé dans des systèmes verrouillés et non-interopérables.

Pour qu'Internet reste fidèle à ses principes fondateurs qui l'ont conduit à son succès, nous devons y trouver des applications libres, c'est-à-dire dont le code source est ouvert, accessible et sous licences libres.

Éthique

Framasoft s'engage à n'utiliser que des logiciels au code source « libre » en plébiscitant un Internet fait de partage et d'indépendance.

L'exploitation, la surveillance, la censure et l'appropriation des données sont des valeurs que Framasot refuse au profit de la transparence (la probité), de l'exposition claire des conditions d'utilisation des services, et du refus des discriminations.

Framasoft s'engage ainsi à ne pas exploiter les données des utilisateurs de ses services, et à promouvoir un Web ouvert et équitable.

Solidarité

Les services que Framasoft propose promeuvent un modèle économique fondé sur la mutualisation des coûts, le partage des ressources, et l'accessibilité au plus grand nombre.

Ce modèle possède aussi un caractère éducatif car en documentant le déploiement des services, un grand nombre d'utilisateurs seront en mesure de partager à leur tour ces ressources.

Nous pensons que ne pas infantiliser les utilisateurs et faire partager la responsabilité de l'utilisation des services permettra de réguler les abus.

Framasoft s'engage à promouvoir le respect et l'autonomie de ces utilisateurs (tant que la réciproque sera vraie).

Décentralisation

L'intelligence d'Internet doit reposer sur chaque acteur du réseau dans une dynamique de partage de pair à pair, pour éviter de créer un Minitel 2.0[7].

Pour assurer l'égalité de tous, citoyens comme entrepreneurs, les monopoles doivent non seulement être évités, mais empêchés de s'accaparer les données personnelles ou publiques.

En expliquant, par des tutoriels, comment multiplier les solutions libres permettant un Internet plus équitable, Framasoft facilite l'essaimage du code et diversifie les usages.

Framasoft s'engage également à faciliter l'auto-hébergement et l'interopérabilité, afin de ne pas « enfermer » ses utilisateurs.

Le projet C.H.A.T.O.N.S.

Face au succès remporté par sa campagne de degooglisation d'Internet, Framasoft a vu le nombre d'utilisateurs de ses services en ligne grimper en flèche en même temps que la charge de travail pour les maintenir, et assurer le support tout en continuant à en proposer de nouveaux. L'association, animée par cinq permanents, vit principalement des dons et ne souhaite pas grossir pour rester à taille « humaine ».

Pour prolonger cette dynamique et encourager la décentralisation des services, Framasoft a alors lancé l'initiative C.H.A.T.O.N.S.[8] (Collectif des Hébergeurs Alternatifs, Transparents, Ouverts, Neutres et Solidaires) afin de rassembler différentes structures et initiatives qui hébergent des services, données et contenus à leur manière tout en respectant un manifeste et une charte communs[9].\ Ces deux documents sont rédigés et modifiés collectivement par les membres du collectif, pour tenir compte de l'évolution tout autant des différentes structures que de l'environnement social, technique et légal de l'hébergement de données en France.

Politique générale

Le collectif CHATONS possède un mode de gouvernance qui s'inspire directement du Logiciel Libre. Les décisions concernant l'évolution du collectif et de la charte seront prises de manière collégiale. À la manière d'un code source, le modèle du collectif pourra être dupliqué et modifié pour qu'il puisse s'adapter, par exemple, à des particularités régionales.

Chaque membre est invité à participer aux décisions collectives qui se prendront, autant que faire se peut, de façon consensuelle. En cas de conflit d'opinion, les décisions pourront être prises à la majorité simple.

Le domaine chatons.org est maintenu et hébergé par Framasoft (tant que cela sera possible et sauf si le collectif en juge autrement). Il comportera un site web, comprenant la liste des membres, ainsi qu'une liste de diffusion permettant d'animer le collectif par l'échange entre ses membres. Ces derniers seront invités à collaborer aux contenus diffusés par ce site, de manière à communiquer publiquement des informations relatives au CHATONS et à l'hébergement libre.

Il n'existe aucun statut administratif du CHATONS puisqu'il consiste principalement en une liste publique recensant ses membres, ainsi qu'en un ensemble de documentation visant à faciliter l'échange de savoirs, la capitalisation de bonnes pratiques, et l'essaimage.

Toute organisation respectant les principes du présent manifeste et de la charte du CHATONS peut prétendre à en devenir membre. Pour être maintenue en tant que membre, elle devra communiquer au collectif les informations concernant son point de contact et inscrire au moins l'un de ses propres membres sur la liste de discussion.

Après discussion et éventuellement quelques conseils proposés, un vote à la majorité simple pourra avoir lieu concernant l'acceptation de cette nouvelle organisation par le collectif.

Un ou plusieurs membres peuvent toutefois se réserver le droit de réclamer le retrait d'un autre membre à condition :

- d'étayer la proposition à partir d'arguments probants diffusés à l'ensemble des membres ;
- d'accepter un vote collectif, avec ou sans débat contradictoire.

Conscient qu'il n'est pas possible de garantir le respect de l'ensemble des points de la Charte des CHATONS sans nuire à la confidentialité des données personnelles hébergées sur les systèmes informatiques des membres, le contrôle entre pairs sera **de facto** imparfait. Le collectif repose donc avant tout sur la confiance et la bienveillance que s'accordent les membres entre eux.

Les CHATONS devront donc trouver, entre eux, et dans le respect des points de vue chacun, les bonnes pratiques et règles d'inclusion, de mise en cause ou d'exclusion des membres, dans l'intérêt prioritaire du respect des libertés fondamentales et de la vie privée des utilisateurs des services du collectif.

Les engagements

Les membres du collectif s'engagent à respecter la charte du collectif, dont les principes sont les suivants.

Transparence, non-discrimination et données personnelles

La probité est le maître-mot de ces engagements, selon différents points visant à asseoir la fiabilité des services proposés et la confiance des utilisateurs dans ces derniers. Les conditions générales d'utilisation (CGU) doivent être parfaitement claires, accessibles et non contradictoires avec la charte des CHATONS.

L'hébergeur doit assumer et afficher une politique ouverte de gestion des comptes utilisateurs : sans discrimination, que l'accès soit gratuit ou payant, et dans le respect de la juridiction du pays concerné.

L'hébergeur s'engage à laisser la possibilité pour tous les utilisateurs de pouvoir récupérer leurs données personnelles, chiffrées ou non, sauf dans le cas de services particuliers reposant sur le transfert éphémère et chiffré d'informations personnelles.

Ouverture, économie, protection

Les services proposés doivent satisfaire à quelques exigences techniques. Les serveurs doivent notamment reposer sur des solutions logicielles libres. Ces logiciels permettront de rendre possible la reproductibilité du service sans générer de développements supplémentaires quant à la structure du serveur, ou alors à titre de contribution à ces logiciels libres.

L'utilisation des formats ouverts est obligatoire, à minima pour toutes les données diffusées à destination des utilisateurs. Cela suppose une politique affirmée en faveur de l'interopérabilité. Ainsi, lorsque l'utilisation de formats ouverts est impossible (par exemple s'il faut télécharger un programme à installer sur un système d'exploitation privateur), les données doivent être sous licence libre et disponibles pour un maximum de systèmes d'exploitation. Les sources doivent être rendues accessibles.

Les membres du CHATONS s'engagent à respecter les termes des licences libres des logiciels qu'ils utilisent (y compris mentionner ces licences, renvoyer vers les sources, etc.).

En matière d'éthique, le sponsoring est accepté, ainsi que le mécénat, le don, ou le fait d'avoir un modèle économique consistant à faire payer des fonctionnalités ou même tout le service. Le modèle économique de chaque membre du CHATONS doit être clairement exprimé sur une page dédiée que l'utilisateur peut facilement consulter et comprendre. Évidemment, les aspects économiques de l'activité de chaque membre du CHATONS doivent être rigoureusement conformes avec la législation du pays concerné.

En revanche, il ne sera accepté aucune publicité en provenance de régies publicitaires. À ce titre, aucune exploitation des données personnelles ne sera accomplie, le suivi des actions des utilisateurs ne pourra se faire qu'à des fins uniquement statistiques et légales, les adresses des utilisateurs ne pourront être utilisées qu'à des fins administratives ou techniques. Les outils statistiques devront, eux aussi, être libres et remplir les conditions du Collectif.

Solidarité et essaimage

Les membres du CHATONS se doivent entraide et assistance, par une liste de discussion dédiée ou par tout autre moyen à leur disposition, y compris la tenue d'assises ou de réunions périodiques. C'est ainsi que les membres du CHATONS pourront faire progresser leurs services. Un des moyens les plus efficaces pour maintenir cette entraide systématique est de contribuer au développement des logiciels libres utilisés.

Les membres ne doivent cependant pas demeurer dans un entre-soi qui ne satisfera qu'un nombre limité de personnes, générateur de discrimination dans l'accès aux services. Au contraire, tous les efforts de communication envers le public sont encouragés de manière à essaimer les solutions d'hébergement libres et créer du lien autour des principes défendus par le collectif. Les moyens doivent être mutualisés et peuvent passer par des formations, des séances d'information publiques, la tenue de stands lors de diverses manifestations, des interventions lors de conférences, la publication de plaquettes, etc.

Neutralité

Les services d'un membre du CHATONS ne pourront être hébergés par un acteur qui, par réputation, ne favorise pas la neutralité du réseau.

Les paquets de données doivent transiter sur les services du membre du CHATONS sans discrimination, ce qui signifie qu'il ne doit pas en examiner le contenu, la source ou la destination.

Aucun protocole de communication ne pourra être privilégié dans le mode de distribution des informations. Et aucune donnée ne pourra voir son contenu arbitrairement altéré.

La neutralité du CHATONS est aussi une neutralité politique dans la mesure où les convictions de chaque membre ne seront ni examinées ni sanctionnées tant qu'elle n'outrepassent pas le cadre législatif en vigueur.

AMIPO, expérience d’un CHATONS en construction à Orléans

L'Association de Maintien de l'Informatique Paysanne Orléanaises (AMIPO) est une déclinaison des "AMAP" françaises (Association d'agriculteurs bio qui fournissent directement leurs fruits et légumes aux personnes abonnées), avec l'idée d'aller chercher ses bons octets chez l'association du coin plutôt que dans un « supermarché » américain. Le « paysan » est aussi celui qui travaille à son autosuffisance tout en contribuant à faire évoluer son environnement et son paysage…

S'inscrire localement dans l'initiative C.H.A.T.O.N.S. commence par réunir un premier groupe de personnes motivées par l'idée de réfléchir de manière pratique au pourquoi du comment. De premiers prototypes de services installés sur des serveurs de récupération derrière un accès internet définitivement dissymétrique (plus de capacités de téléchargement que d'envoi avec l'ADSL[10]), il s'agit de passer en « production » sur des serveurs hébergés chez des prestataires à l'éthique synchrone avec nos valeurs de départ (Comme ARN[11] en Alsace ou Tetaneutral[12] à Toulouse).

Cela implique de monter une structure juridique (en l'occurrence une association collégiale[13], sans président ni bureau), ouvrir un compte en banque, organiser une soirée de lancement pour récolter des fonds, créer des contenus de sensibilisation et des formats d'ateliers dans une logique d'éducation populaire, s'accorder sur les technologies employées et les services proposés, définir si la page d'accueil du site se doit d'être en http ou https, créer les outils de communication et de documentation, s'organiser pour installer et administrer collectivement les serveurs, s'assurer que l'on est en accord avec la charte en mettant notamment en place des sauvegardes, proposer des temps et de canaux de communication pour pouvoir répondre aux questions des utilisateurs…

L'AMIPO est ainsi partie pour proposer en premier lieu un service de « cloud personnel » (basé sur NextCloud) qui permette de stocker ses fichiers, contacts et agendas, et ce gratuitement, avec la possibilité de disposer d'un espace plus important en adhérant à l'association. Les envies du collectif ne s'arrêtent pas là, il pourrait s'agir de proposer ensuite un service de VPN (Réseau Privé Virtuel[14]), de travailler au chiffrement de bout en bout afin que nous ne puissions pas non plus regarder les données qui nous sont confiées, puis d'être en capacité de proposer des services aux associations locales ou d'accompagner les projets coopératifs dans leur outillage informatique.

Avec nos doigts calleux de paysans informatiques bourrus, nous souhaitons ainsi planter un maximum de graines dans la têtes de nos condisciples pour que les petits chatons de pixels gambadent sur des chemins libres et arborés.

1. Le premier document de Tim Berners-Lee pour persuader le CERN qu'un système hypertexte global était tout à fait intéressant pour le centre de recherche, c'est ce document qui préfigure le World Wide Web que l'on connait aujourd'hui https://www.w3.org/History/1989/proposal-msw.html ↩

2. https://www.theguardian.com/technology/2017/mar/11/tim-berners-lee-web-inventor-save-internet ↩

3. https://framasoft.org/ ↩

4. https://degooglisons-internet.org/ ↩

5. https://framabook.org/numerique-reprendre-le-controle/ ↩

6. https://degooglisons-internet.org/alternatives ↩

7. Internet libre, ou Minitel 2.0 ? Benjamin Bayart. https://www.youtube.com/watch?v=AoRGoQ76PK8 ↩

8. https://chatons.org/ ↩

9. https://chatons.org/charte-et-manifeste ↩

10. https://fr.wikipedia.org/wiki/ADSL ↩

11. http://arn-fai.net/ ↩

12. https://tetaneutral.net/ ↩

13. http://www.passerelleco.info/article.php?id_article=103 ↩

14. https://fr.wikipedia.org/wiki/R%C3%A9seau_priv%C3%A9_virtuel ↩

Encrypting mails with usable tools: The mass adoption of encryption technologies

Kali Kaneko

Encryption is the application of mathematics to ensure that our information is *only* accessible to the persons or machines we decide to share it with. Encryption has a long history. Protocols for sending encrypted information without having previously agreed on a shared secret with the other party (for deciphering encrypted data) have been around for roughly 35 years. The landmark Pretty Good Privacy program, often abbreviated as PGP, made strong email encryption with guarantees of confidentiality, authentication and integrity widely available to users and developers in 1991 [0].

The relative popularity of PGP and its subsequent standardization is often depicted as a victory for the cipherpunks (cryptography activists) during the First Crypto Wars [1]. So, what are the issues that still prevent the adoption of email encryption by the critical and large masses? Why couldn't Greenwald, the respected journalist, encrypt an email when he was contacted by his source Snowden, the analyst working for the NSA [2]?

To answer that, we have to look first at the architecture of internet services, then the economy of surveillance, and finally some historical usability failures.

Email in the times of surveillance capitalism

Email is an open, federated protocol that has been re-centralized by big service providers. These companies exploit economies of scale that lead to the commoditization of email. Negative externalities from the commoditization of email include the arms race that evolved to prevent the spam industry from sending a large amount of unsolicited and often fraudulent email to users.

In the early days of the internet, anybody could run an email provider. The past decade, however, has seen a drastic reduction in the number of email providers. Not only few individuals and collectives run their own email servers, but less and less people know that it is even possible to do so. Email has become another example of technology that is "just supposed to be there". The message seems to be that vital infrastructure is not something that you run for fun. Something similar is happening with Instant Messaging [3].

Losing the battle for open, federated architectures also means losing control over the communication infrastructures we use. The increase in monopolistic practices leads to a lack of interoperability between providers that puts up a barrier of entry for new email service providers.

Monoculture is an imperative for centralized control: it means that an adversary only needs the cooperation of a single player to compromise the private communications of millions. Email is not only about messages: today it is one of the last technological lines of defence in the internet for privacy-aware and localised alternatives for Identity Provision. Legitimate email service providers can still choose to allow their users anonymity or pseudonimity, refuse to track or sell their data, etc.

We increasingly see how mobile devices, instead of email accounts, are required for bootstrapping communication with your contacts. The phone has become the gateway to Facebook's walled gardens in many countries [4]. The lawyer and privacy advocate Lawrence Lessig warned that the Big Regulatory Loop is closing between the Industry and the State [5], a big feat for those “weary giants of flesh and steel” that we didn't use to fear.

Governments and corporations race towards the deployment of pervasive surveillance. When big powers invest so much effort into eroding the fundamental rights of individuals and communities to decide upon the scope of their communications, building - and using - privacy tools becomes a moral imperative. The right to whisper is an irrevocable and fundamental right that is being taken away by the force. Its criminalisation and disappearance has a profound impact on our capacity to exert our human rights and shape democratic societies.

We failed to empower people to encrypt

Strategically, email might seem an odd choice nowadays, in an ever changing technological landscape that leans more and more towards mobile applications, and where most users had their first experience on the internet already mediated by the Big Silos. Email is often criticized as an obsolete technology, because its architecture makes it hard to encrypt messages in a way that hides who is writing to whom about what.

Even if more interesting and attack-resistant technologies appear in the future [6], email will stay around at least for a while. Email is the asynchronous medium we have and that needs to be protected. Millions of emails are still sent daily without encryption, and emails with unverified senders are still used for devastating phishing or ransomware attacks.

It is hard to assess whether it is only a fundamental usability problem that we're dealing with, or if on the contrary we are facing a general loss of interest in: 1. email as a tool; 2. privacy and security in online communications; or 3. a combination of the above.

Commercial-level storage is cheap, and providers that rely on the exploitation of silo data and metadata can afford to give it away “for free”. It’s obvious that these providers do not have a real incentive for encryption, because it would undermine their revenue streams. Even providers that support encryption profit from traffic analysis.

It has been shown that users are willing to pay an extra cost for services or apps that respect their privacy [7], yet privacy-aware email providers have to compete against the major market players who exploit economies of scale to offer a baseline of the 15GB of “free” storage, high standards of reliability, speed, etc. In other words, there are many critical users who could contribute to the costs of privacy-aware email providers, but usability and operational costs add up to making it very hard to compete against the established monopolies.

In this sense, any serious attempt to provide alternatives must address the sustainability of technopolitical projects such as privacy-aware email providers.

It's also a problem with tools for nerds

The "scratch your itch" attitude of the Free Software community just doesn't cut it any more for mass adoption. Self-discipline and quality are key for maintaining a sustainable community around pleasant, usable and effective software.

Given the humongous amount of resources that Capital has invested in the cybernetic control of the masses, current user expectations about usability are high. Interacting with digital tools should only require a very small amount of cognitive effort. New technologies that defy too many conventions (visual language and best practices such as common metaphors, established interfaces, features such as multi-device syncing, mobile first design, etc.) erects barriers against their adoption. The eternal request from users to developers for the well known “wall” or “like” features in new technologies shows that arbitrary signs have became normalized.

Nonetheless, oversimplification at the cost of irrevocably hiding complexity from the user is not the only available option – and it often backfires. One could dream of an interface that makes everyday tasks simple, but allows users to explore further possibilities as they learn more.

Nerd-driven development also shifts focus whenever a new shiny technology emerges. That might partly explain, why some technology stacks just languish and rot. We need to cultivate excellence even in pieces of technology that don't get the excitement associated with new developments. If we want crypto to spread outside the techie ghetto, half-baked and unmaintained tools that are unusable should be abandoned. Arrogance about what users need to know or do before accomplishing the most basic task must be held under control.

One example of broken tech is the Web of Trust system used for identifying genuine email addresses. Didactic attempts to explain its necessity for safe encryption practices have failed along the years, perhaps because it was based on broken assumptions from its inception [8].

Looking at possible solutions

Many projects have blossomed in the post-Snowden era. I mention here one I am contributing to, and others that I consider interesting, both in terms of working software and evolving protocols. My focus is on initiatives that build interoperable

solutions on the top of the existing email infrastructure using the OpenPGP standard.I also briefly mention some new silos that try to monetize on the crypto fuzz.

Bitmask and the LEAP Encryption Access Project

LEAP aims to develop encrypted email services that are easy to deploy and clients that are simple to use [9]. LEAP implements opportunistic email encryption, which is a transparent process that requires only a little cognitive effort from users, and low maintenance costs for providers. LEAP software may enable many federated providers to enter the email provisioning space by lowering the technical and economical costs.

On the server side, the LEAP Platform is a set of complementary software packages and recipes to automate the maintenance of LEAP services. Its goal is to make it as painless as possible for sysadmins to deploy and maintain secure communication services, as well as to help providers manage registration and billing.

On the client side, the Bitmask application runs in the background. It acts as a proxy for the same email programs that users are already familiar with. Alternatively, another interface is available that run in the broswer (through a customised version of Pixelated). Bitmask finds the relevant encryption keys for email addresses automatically, and works across different devices. All data (including the encryption key database and the email itself) is end-to-end encrypted, which means that service providers have no access to the contents. As part of the Panoramix project, anonymous routing capabilities defending against traffic analysis will be added too, providing a greater level of privacy.

Throw your metadata through the Memory Hole

In an email, the data is the content: the letter that you write. The metadata is everything that helps the content be routed to its intended recipient: it is equivalent to the stamp, the envelope and the address of the recipient and the sender in a traditional mail.

Conventional email encryption technologies are only concerned with protecting the content of the message. Therefore, the metadata remains visible in transit. Intermediaries who act as postmen can see your address, the recipient, date, subject line and even the path the message took to its destination.

The Memory Hole project aims to fix this problem by stashing metadata in the contents of the e-mail in a standardized way. This means to hide as much metadata as possible inside the "protected" envelope from intermediaries such as service providers or spy agencies.

By implementing this proposed standard, all the Memory Hole compliant email program can protect a good amount of metadata from snooping and modification in transit. Look for this feature in the near future!

Autocrypt: Such crypto, much mail

The Autocrypt project develops email encryption that is convenient enough for mass adoption even if it cannot be as secure as traditional email encryption.

The project is driven by a diverse group of mail app developers, hackers and researchers who are willing to take fresh approaches, learn from past mistakes, and thereby increase the overall adoption of encrypted email. Some popular software such as K9 (mobile email app), Enigmail (encryption plugin for the Thunderbird mail reader) or Mailpile (a web interface for email) already support this protocol.

Autocrypt uses regular email messages to exchange the information that allows the encryption of subsequent messages. It adds metadata to the email that stores the encryption keys associated with users, as well as their relevant preferences about encryption behaviour.

The Webmail family: Modern email clients built on web technologies

A webmail interface offers an intuitive user experience. It runs in the browser that is available on any desktop computer. In-browser apps pose some security problems (unverifiable code execution, secrets storage open to a very wide attack surface, etc.) but also lower the barrier to adoption drastically.

10

Mailpile [10] is a self-hosted email service. Its user interface takes advantage of widely supported web standards such as HTML5 and JavaScript. The interface connects to a backend that typically lives on the local device, but may also run on a server. It supports end-to-end encryption via the traditional OpenPGP standard. The interface emphasising searching and tagging, which makes it a bit similar to the popular Gmail web inferface and sets it apart from most other free software email programs. The Mailpile initiative holds a lot of promise as a modern cross-platform mail client, especially since the Mozilla Foundation stopped supporting the development of its main alternative, Thunderbird desktop email client software.

Another interesting open-system webmail approach was Whiteout, which closed in 2015 with more than 10.000 users. Their open source software implemented interoperable protocols. In their post-mortem note they shared some calculations about what a viable market of encrypted messaging apps could look like [11], although the lesson might well be that the model of startup companies is not suitable for tackling the surveillance problem.

Mailvelope [12] might be a suitable option when compromises have to be absolutely made. It is a browser extension that allows you to use OpenPGP email encryption with mainstream webmail providers like Gmail, Yahoo, and Outlook. Popular free software webmail applications like Roundcube (the webmail offered by projects like Riseup or Autistici) also support the Mailvelope plugin [13].

Non-email messaging services

Last, I'd like to mention several initiatives that are gaining traction among users that seek secure email providers, but that cannot be considered as interoperable and encrypted email services. They usually support end-to-end encryption only between users of the same service, and fall back to unencrypted email for users of other providers. Alternatively, some require that users across providers exchange a shared secret manually – which defeats the purpose of public key cryptography that is the big thing about the OpenPGP standard used by the other projects, and centralizes the ecosystem once again.

Known examples of this category of centralized, non-email services are ProtonMail (a Swiss webmail app that only does encryption between its own users, sending unencrypted email to others) and Tutanota (a webmail interface and mobile app that

requires external recipients to decrypt the message on the Tutanota website with a pre-shared secret).

For in-depth reviews of other initiatives, and a nice overview of projects that support email encryption, an extensive comparison is available online [14].

Some remaining challenges

The quest for reducing the interception of our global communications is still ongoing. The challenge is to collectively recover control over the email medium. As shown above, some projects are making good progress in adopting new strategies for achieving mass adoption of easy-to-use email encryption.

The promise is that over the coming months better programs for email encryption can work together in a mostly automated way, demanding less user intervention while still ensuring that users can decide who can see their messages while they travel across the internet.

But programs do not get written alone: I encourage you, especially, to try clients like K9, Enigmail, Mailpile and Bitmask. Test them out. Try more than one. Try them with your friends, with your family. Engage with their communities, join their mailing lists and IRC channels. Learn more about their strengths and limitations. Report problems when they break, try new versions, write or improve translations to your own language, start hosting a new email provider if you can and above all, continue contributing to the process of collective creation. If you believe in the right to whisper, engage in the global conversation and raise your voice.

Take care! I look forward to reading you securely in the intertubes.

[0] There are several different properties that crytographic encryption solutions traditionally aspire to provide. *Confidentiality* is obtained by encrypting messages, which in plain English means scrabbling them in order to avoid third parties to understand their contents so that original content recovery by third parties is almost impossible. *Authentication* is done by signing the content on one end and verifying the signatures on the other end to make sure that the message was really sent by the

claimed author. The way the encryption is done also allows to preserve content *integrity*, ensuring that no third party (like a government, corporation or malicious person) could change the message in transit.

[1] In the Cold War, the USA and its allies developed an elaborate series of export control regulations designed to prevent a wide range of Western technology from falling into the hands of others, particularly the Soviet bloc. Export controls on encryption became a matter of public debate with the introduction of the personal computer. Zimmermann's PGP and its distribution on the internet in 1991 was considered the first major 'individual level' challenge to cryptography export controls, although ultimately, the popularization of e-commerce probably did play a much bigger role in the outcome. https://en.wikipedia.org/wiki/Crypto_Wars

[2] When Snowden first tried to contact the Guardian journalist Glenn Greenwald, cryptography hackers and privacy activists collectively experienced a harsh reality check that punched our little Web of Bubble: no security is effective without usability. If an NSA analyst is forced to craft awful videos in order to teach a journalist how to install a tool called gpg4win, downloaded from an ugly website, do some scary copy/pastes and other such delights shown in the 12 minute video, we can strongly conclude that the usability, and general state of email encryption is **terribly broken**. So, more than ten years after the seminal article, we can affirm that sadly, Johny cannot yet encrypt.

[3] In other words: the long death of Jabber/XMPP. It's frustrating how, over and over again, the fragmentation of an open ecosystem leads to centralized solutions. One can understand Signal developer and crypto anarchist Moxie Marlinspike's rants against federation only in terms of the desire of deploying updates to millions of users without waiting for the long tail and the distributed consensus to catch up. In the mobile messaging world Signal is right now the best thing we have, but it still represents a failure of the technosocial processes that prevented the open federation of communication infrastructures from becoming a reality today.

[4] And with the phone, the policy of mandatory real-name registration. This practice is enforced by telecommuncations companies on behalf of states that pass anti-anonimity laws.

[5] http://codev2.cc/download%2Bremix/Lessig-Codev2.pdf

[6]

[6] Projects like Pond, Retroshare or Secushare might be good insights into what a post-email secure, distributed standard might look like. Note that the Pond author recommends using the Signal app for practical purposes until his own software is more polished and reviewed.

[7] See, for instance The Value of Online Privacy and What is Privacy Worth?

[8] https://github.com/micahflee/trollwot

[9] https://downloads.leap.se/publications/cans2016.pdf

[10] https://mailpile.is

[11] https://tankredhase.com/2015/12/01/whiteout-post-mortem/index.html

[12] https://mailvelope.com

[13] https://roundcube.net/news/2016/05/22/roundcube-webmail-1.2.0-released

[14] https://github.com/OpenTechFund/secure-email

Keeping technological sovereignty: The case of Internet Relay Chat

Maxigas

New technologies sometimes manifest a critique of the existing conditions, but their empowering affordances are often lost as their features are progressively integrated to the requirements of capitalism during their subsequent development. The history of chat devices is a textbook example of critique and recuperation in technological cycles. However, the social history and contemporary use of IRC (Internet Relay Chat) proves that such historical logic can be – and *is* – resisted in some exceptional cases. This case study does *not* necessarily recommend IRC as a medium of communication for activists, but rather seeks to put forward some theses on the history of technology that could be found useful in certain situations.

The systematic study of such cases may contribute to the refinement of a taste for critical technology adoption practices in communities who wish to keep control over the technologies that mediate their social relations. Therefore, an appreciation of critique and recuperation in technological cycles may help to further technological sovereignty (Haché 2014) over longer time frames, where local efforts could potentially become part of capitalist regimes of oppression and exploitation over time. A corollary observation is that technical features may result in crucially different technological affordances depending on their context of use: this shows that pure techniques should never be promoted or rejected in themselves.

Internet Relay Chat

Internet Relay Chat is a very basic but very flexible protocol for real time written conversations. It has been first implemented in 1988, one year before the World Wide Web. IRC reached the height of its popularity as a general purpose social media during the first Gulf War and the siege of Sarajevo (1992-1996). At this time it performed various functions that were later fulfilled by specialised programs and

platforms, such as dating, following friends or file sharing. As the population of the Internet grew and market consolidation set it on the turn of the millennium, IRC faded from the public view.

However, it is known from seminal studies of contemporary peer production communities that free software developers (Coleman 2012), hackerspace members (Maxigas 2015), Wikipedia editors (Broughton 2008) and Anonymous hacktivists (Dagdelen 2012) use primarily IRC for everyday backstage communication. While the first group has always been on IRC, the latter three adopted it after the apparent demise of the medium. “Why these contemporary user groups – widely considered as disruptive innovators and early adopters – stick to a museological chat technology despite its obvious limitations within the current technological landscape?” Currently popular social networking platforms, such as Facebook and Twitter, offer similar features and appear to be a more obvious choice. *I* propose that while IRC use can seem retrograde, it is actually a critical technology adoption practice that empirically evades, and analytically highlights the pitfalls of mainstream social media monopolies.

Recuperation

Critique and recuperation in technological cycles is a process of integrating societal demands into the capitalist system. New technologies sometimes embody a demand for a better society and a critique of the existing conditions. While such demands are typically addressed by subsequent versions of the same technology, the same technology is also made to conform to the two main requirements of the capitalist system. These latter two are *the preservation of social peace (i.e. repression), and the intensification of exploitation (i.e. capital accumulation)*. It happens that the implementation of these two requirements neutralises the societal gains from the demand originally associated with the technology.

One aspect or form of recuperation is *commodification*. Commodification is when something at some point becomes a commodity to be brought and sold on the market, e.g. a commodity. Commodification targets *authentic* things, which are often already perceived to be valuable – for instance as a moral good – but not yet recognised as an

object of monetary exchange. The loss of authenticity through commodification produces *anxiety* in consumers, which can be diagnosed as the affective trace of capital's violence.

To summarise, *critique* addresses a social problem as a demand. *Recuperation* is the implementation of the demand, but in the same movement also the transformation of the technological context in a way that neutralises the critique. The requirements that the implementation of the demand has to paradoxically fulfil are (a.) keeping *social peace* (repression) constant while (b.) increasing *exploitation* (capital accumulation). *Commodification* is an aspect or mode of recuperation that often happens in technological cycles. Commodification targets *authentic* goods which are outside of the market, and integrates them into the circulation of commodities. *Anxiety* is the byproduct of commodification as the affective trace of capital's violence.

Chat history and other examples of recuperation

Recuperation as a historical logic can be seen at work in a wide range of technologies, from the history of chat to the development of personal computing. I concentrate on the history of chat devices because this is the context of the IRC story. While the history of chat devices is a textbook example of critique and recuperation in technological cycles, the story of IRC is a counter-example that shows the possibility of resisting the historical logic of capitalism.

Chat devices answered a basic human need to discuss arbitrary topics informally in a real time environment. After a long and parallel history of chat devices, in the 1990s they consolidated into IRC (more or less as a corollary to the consolidation of Layer 2 networks into the Internet). The next generation of chat devices were *Instant Messengers* (Maxigas 2014). On the backend (Stalder 2013), IMs used proprietary protocols and centralised infrastructures, instead of the community defined protocols of IRC and its federated model. On the frontend (Stalder 2013), IMs were organised around private conversations, in stark contrast with IRC's concept of topical channels (itself taken from Citizens' Band – CB – radio). Later, as the World Wide Web took off, chat features were integrated into Web 2.0 *social media platforms*.

Eventually, *surveillance* came to be the key means for both maintaining social peace and deepening exploitation on social media platforms.[1] Everyday, informal, even intimate gestures are captured and stored, sorted and mined for the purposes of both targeted advertising and targeted repression. Such revenue is indispensable to the capital accumulation mechanisms of a growing section of capital, while the intelligence gained by authorities who share access to the information flows is essential to the maintenance of social order in both dictatorships *and* democracies. All this hinges on successful *platformisation*: the ability of a vendor to install themselves as an obligatory passage point for generally mundane and often minuscule social interactions (Gillespie 2010).

The anxiety experienced by users stems from the fact that a supposedly informal space of social interaction is mediated by capital and overseen by the state, through mechanisms that look obscure, arbitrary and partial from below. One can remember that the two defining characteristics of a healthy *civil society* that can support technological sovereignty are its independence from capital and separation from the state (Haché 2014). It is *privacy* in a structural and collective sense that can be reclaimed through technological sovereignty initiatives, but only through the continuous struggle of users for taking the technological mediation of their social life into their own hands.

It is important to realise that neither chat (Latzko-Toth 2010) nor personal computing (Levy 1984) were “inventions” in the sense that a good idea was implemented and socialised through commodity circulation. Both found a foothold in the market only after a relatively long period where fringe elements fought for them, often breaking existing laws, regulations and social norms. Society then slowly tamed these technologies – and now they are used to pacify society itself.

Backlogs

As a Human-Computer Interaction limitation

IRC is different from many other chat devices in that users can only follow conversations as long as they are logged in. If a particular user is not online, there is no way to contact her. Conversely, when a user logs back to a channel, she has no idea

what she missed while she was offline. Due to the flexibility of the medium, there are many workarounds for the lack of backlogs, but the fundamental fact remains that solving this problem is out of scope of the IRC protocol. Network operators could solve the problem if they wanted, but in practice users are – literally – left to their own devices.

As a classic affordance

When IRC was conceived (1988), the lack of backlogs was not a particularly unique property of IRC - the feature was absent from several other chat devices. However, by the end of the decade – when the population of the Internet exploded – it took on a particular significance. While purveyors of various other services had to look for a business model in order to ensure the sustainability of their operations – IRC operators were not forced to commodify their services. Why?

Because keeping track of backlogs for each user would mean that resource utilisation scaled exponentially with the number of users, whereas if the server only broadcasts new lines as they arrive and then forgets about them, connecting more users results in little overhead. This is more or less true for both processing power and storage capacity: the two essential computing costs to be taken into account when operating services. Similarly, keeping backlogs would increase the complexity of server software, translating into increased costs in terms of development and administration work hours. Thus, the lack of backlogs arguably makes IRC more simple and efficient.

How these factors played out historically was that workers at Internet Service Providers or academic outlets could just let a spare server running in the corner, without having to justify the expenses to funders or answering too many questions from their superiors. Under-the-counter IRC hosting can be thought of as the détournement of fixed capital by users, rather than the recuperation of users' demands by capital. Again, in the beginning of the decade it was usual practice for the Internet community to run popular services on a volunteer basis, or for institutions to contribute to the running costs of public infrastructures. However, by the end of the decade the dotcom bubble was in full swing and users flooded the networks, so that operating media comparable to the popularity of IRC was serious business.

"Scaling" became a buzzword of the era. It referred to the architectural problem of designing technologies that given enough resources could answer an arbitrarily large amount of requests, following the growth of the user base without collapse. The lack of backlogs allowed IRC to keep up with the radical increase of Internet users and *become a mass media of its own*. IRC came to be the most popular dating application before dating websites went online, music sharing software before the rise and fall of Napster, and micro-blogging service before Twitter cashed in on hashtags. Users saw nothing geeky or techie in IRC in the 1990s: it was as commonplace as the ubiquitous GeoCities home pages.

An anecdote illustrates the relationship of IRC to the burgeoning IT industry. It was already 1999 when Microsoft included an IRC client in the default installation of its popular Windows operating system, taking note of IRC's mainstream appeal. In the first major attempt to recuperate IRC, the software was developed by the company's Artificial Intelligence research unit, and the application connected automatically to the company's own IRC servers. Ironically, the Comic Chat IRC interface was never popular with users, and the only artifact that went down in history from the whole enterprise was the Comic Sans font, which is still the laughing stock of Internet users. Microsoft never figured out how to make money from the largest online chat phenomena of the time.

As a modern affordance

The lack of backlogs came to mean a very different thing in the age of mass surveillance. For instance, take a sticker from the Riseup collective (the largest anarchist/activist email provider) on my laptop. It is advertising their services with the slogan "No Logs, No Masters". They can disperse with keeping logs because they are based in the United States: in Europe, the implementation of the EU Data Retention Directive requires communication service providers to keep logs. Ironically, IRC is not included in the scope of the legislation, probably thanks to its obscurity. As I explained earlier, surveillance (technically based on the analysis of log files) is not only seen as indispensable for national security, it is also generating the advertisement revenue of companies like Google, accounting for 89% of its profits in 2014 (Griffith 2015).[2] The kind of digital milieus where average Internet users chit-chat nowadays have been variously described by scholars as *enclosures*, *walled gardens* and *social media monopolies* (Lovink and Rasch 2013).

In contrast, IRC networks are made up of federated servers run by otherwise unconnected actors, from individual geeks through academic institutions to IT companies or even criminal organisations. So much so, that upon logging in to a mainstream IRC network today, it is actually hard to find out who is sponsoring the resources behind the server. The model of Internet-wise, community-run, community-policed and community-developed communication resources may seem atavistic today, when even starry-eyed activists think that it is impossible to change the world without becoming entrepreneurs and finding a "sustainable" business model. However, running the infrastructure as a commons works for IRC just as well as in the 1990s. It allows users to understand and control the media they use to share and collaborate: an essential condition for nurturing *technological sovereignty*.

The late Fidel Castro said that "a revolution is not a bed of roses. A revolution is a struggle between the future and the past." Here, we could say the past and the present. Like Cuba, despite IRC's relevant affordances that answer to the burning questions of the day, both are increasingly anachronistic in the context of the contemporary technological and political landscape. Using, maintaining, and developing IRC became increasingly cumbersome: like building a veritable time machine that can bring back techno-political conditions from the past.

The same feature that allowed IRC to become a mass media in the 1990s actually *prevents it from mainstream adoption in the 2010s*. Users dropping into a channel, asking a question, then leaving in frustration 20 minutes later are a case in point. These *lamers* living in the age of mobile connectivity cannot keep their IRC clients logged in for hours on end, like the owners of desktop computers once did, and IRC users who have access to always-on servers do today. Now, only relatively sophisticated users get the full IRC experience, and feel part of the chat channels community. Such elitism excludes less motivated users, but keeps the conversation within the circles of those "*who care about the quality of the material*":[3] active members of peer production communities.

Conclusions

It seems that technical deficiencies can have positive social consequences. The same limitation – the lack of backlogs – that allowed IRC to become a mass media in the 1990s, prevents its mass adoption in the 2010s. However, it also poses problems for data mining and surveillance, which eventually forestalls its recuperation. As a user-controlled technology, it now plays an important part in the media ecology of the Internet, as the everyday backstage communication platform for peer production communities.

These relatively sophisticated user groups benefit from the simplicity, flexibility and open architecture of the medium, which allows them to customise it to their needs. Conversely, most Internet users are used to be served by corporate social media platforms that cater to their needs effortlessly. The contrast between the two approaches to technology adoption begs the question whether it is more desirable to work for the democratisation of knowledge or merely the democratisation of technology.

The lack of backlogs helped to build technological sovereignity for Internet users for a decade and later sheltered peer producers from the capitalist requirements of exploitation and repression. Those who care about IRC had to navigate a terrain of changing social conditions – including rifts in the technological landscape and paradigm shifts in political economy – which recontextualised the significance of technical features and limitations. The contemporary use of IRC is based on properties and patterns of the medium that were commonplace in the 1990s but were superseded by more capitalist media since then. Therefore, it can be conceptualised as a *time machine* which brings past technological and political conditions to the present, with surprising consequences.[4]

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> 1. *“The legacy of the 20th century has accustomed us to think that social control pertains only to the political, but it has long since become primarily an economic question of commercial implications. It is no coincidence that the NSA has made use of the collaboration with Microsoft, Yahoo, Google, Facebook, Apple and so on, to obtain data for the surveillance program PRISM.”* (Ippolita 2015, 7) ↩

> 2. *“Google is a profit-oriented, advertising-financed moneymaking machine that turns users and their data into a commodity.”* (Fuchs 2012, 47) ↩

> 3. A reference to organised crime syndicates in the Black Lagoon anime series. ↩

> 4. With the support of a postdoctoral grant from the Universitat Oberta de Catalunya (UOC) and the sponsorship of the Central European University Foundation, Budapest (CEUBPF) for a fellowship at the Center for Media, Data and Society in the School of Public Policy. ↩

Digital Governance

Once upon a time...

There was a city on the shores of a mountain lake. The city was very dirty because people threw the waste in the streets; the water ended up in the lake, which became polluted and smelly. More stringent laws were enacted, but nothing happened despite reprimands and fines; even jail proved ineffective. The people had become accustomed to malpractice, they had become addicted to the stench of open sewers and toxic fumes of burning garbage heaps. Every remedy miserably failed. Those who could not bear the situation any more had packed up and ran – others were simply resigned. After all, they thought, that even if they would act as they should, as the others would continue to misbehave, it was not worth doing anything.

Then, one day, a manager arrived in town. He proposed to help solve the situation, but only if the city government entrusted him full powers in the matter. If something went wrong, if citizenship complained, they would give him the heave-ho. So he obtained a total delegation. The manager turned impresario and his technical people put many trash baskets in place and announced a fantastic waste collection game. Anyone could participate: just follow the rules for separate waste collection and you could win amazing prizes.

It worked so well that after a few months the city was clean. But now public transport was in crisis. Wild parking. Unsafe roads. And there was no public money available. The manager turned entrepreneur and obtained carte blanche to handle the other sectors in difficulty. He had the citizens registered with full name and address on his social platform. On it they accounted word for word what they were doing, and what their friends and acquaintances did, and people around them.

These and many other actions allowed to enter special ranks; players who distinguished themselves could level up, and gain access to new exciting rewards thanks to their statuses. A sophisticated system made that you could accumulate credits in the form of digital currency on accounts managed by the various impresario companies. The list of wrongful actions was continuously updated. Denouncing an

illegal action by a neighbour, for example, entitled the informer to three minutes of free shopping at one of the impresario's supermarkets; five minutes if it was an information about a first time offender. Digital currency credits replaced traditional money within the city. Every interaction could be quantified based on credit, that you could buy and sell: the impresario's bank took only a small percentage of each exchange.

The city government was dissolved. In its place came a technical governance by the manager, run as a private organization, which resulted in a great saving in terms of time, money and energy. The city quickly became a model for the whole world. Professionals came from far away to study the miracle. Everyone agreed on the most notable feature of the set-up – the true realization of heaven on earth – that there was no need to think or to choose, since a magnificent system of notifications was continuously informing all the players about the next moves to be made in order to gain a reputation. The few dissident voices claimed that the players were acting like automatically pre-programmed machines, but as an initially sceptical citizen confessed, he finally really felt free for the first time in his life. No one wanted to go back to a time when they were in the grip of uncertainty and doubt about what they should choose.

And so everyone was trained and lived happy thereafter.

Gamification

This story is meant to illustrate the main elements of 'gamification', one of the implementation formats of digital governance systems. Its basic mechanism is very simple: everything that can be described as a problem is converted into a game, or, rather, in a game pattern. Repeating an action deemed correct is encouraged by way of rewards, credits, access to a higher (hierarchical) level, publication in charts or records. Seen from a regulatory point of view, this means that instead of sanctioning infractions, compliance with the rules is rewarded. The outcome is a system of norms which is self-conforming and positive, with no ethical dimension, since the valuation of any behaviour, its axiology, is determined by the system, and not by a personal and/or collective reflection on the action itself. Gamification stands for the society of performance [1].

Loyalty incentives, such as fidelity programs for consumers, for voters, for subjects, have been known for centuries. However, the pervasiveness of interactive digital connection systems opens new scenarios for mass training techniques. With it, cognitive delegation morphs into the delegation of social organization. Automated interaction procedures are refined by capitalizing on the way users handle their personal digital tools. Invidiously, participation in the construction of shared worlds turns into behavioural drill.

Our intention is obviously not to argue for a return to repressive systems. Prohibition and ensuing repression typically triggers a deepening of the desire for transgression and therefore amounts to a negative reinforcement mechanism. Prohibition never works. Yet, conversely, not all that glitters is gold with a positive reinforcement system. Anyone who has dealt with children knows that rewards are more effective than 'teaching them a lesson'. But then one often comes to realize that once the kid gets 'hooked' to the award they will want an ever bigger prize, and that there's no way anything is going to happen unless an even greater accolade can be anticipated. So often a positive reinforcement system reverts into a punitive system, which reveals itself as being merely the opposite of an equivalent system based on rewards.

But education in itself has preciously little to do with compliance with a given rules, and is has also nothing to do with obedience. The same old Socrates, in wanting to educate young people for citizenship by example, did not only break the rules, but he invited others to be disobedient and follow their own "Daimon" (daemon, the 'inner voice'). Algorithmic 'education' is nothing else than drill training, and leads to servitude. Although in appearance it can produce good results in terms of measurable performance, it certainly does not induce independence, autonomy or responsibility.

Pleasure

The line between learning and training is razor thin. The main factor comes down to the organic chemical which plays a central role in learning and responding to positive reinforcement stimuli: dopamine (or more technically "3,4-dihydroxyphenethylamine"), a neurotransmitter that runs through the neural paths of our brain. To simplify what is an extremely complex mechanism, we can say that the sense of gratification and reward we experience when we manage to learn something is

connected to a release of dopamine. In general, the performance of enjoyable activities in the psycho-physiological realm (drinking, eating, having sex, getting appreciation, empathy, etc.) corresponds to an increased concentration of this neurotransmitter. The same applies, by the way, to the use of drugs.

Learning in all its forms, even in physiological activities, requires effort, care and attention. Reading is tiresome, just as is assimilating any new skill. To attain a satisfactory level with psycho-physiological activities requires effort. The simplest and less costly way to raise the levels of dopamine and hence to experience pleasure is to complete a task, or to perform a given procedure, again and again. Repetition, iteration of a given behaviour is the formula. It works as a short-cut.

The emotional development processes take place in the limbic system, the central and oldest part of the brain. It indicates the presence or the prospect of rewards or punishments to promote the activation of motor programmes aimed at giving pleasure or avoid pain. Addictive drugs operate exactly the same way and in the same brain region, causing feelings of pleasure. Once established neuronal connections get increasingly strengthened, thereby losing in plasticity. This kind of connective stiffening corresponds to a decreased ability to relax the state of pleasant neuronal excitation caused by dopamine: in more technical terms, it occurs by way of a long-term impairment of the synaptic pathways that connect neurons. Such trails become like paved roads in our brains, and it takes truckloads of dopamine to feel pleasure. At each step, the necessary dose has to be increased. This explains why drill is so effective, and why it generates addiction. The desire for pleasure related to an automatism, which amounts to compulsive behaviour, makes us enter into a repetitive loop getting out of which becomes increasingly difficult because the neural pathways that are always excited, will not be able to do anything else but get more and more powerful with the passage of time: beat-rhythm-repetition.

The user touches the device. Not once, but many times. From all the touches - every touch is a beat - comes the rhythm, which is repeated in many interactions with the device. Habitual behaviour is manifested in a cycle.

Give us our game back!

We need to approach the concept of cognitive ergonomics (from ancient Greek "ergon – nomos", "rules of the labor"): thanks to the digital media, we can lower our cognitive load and, for example, and delegate to some device the task of remembering all the dates and numbers of our agenda. A very useful support, kind of indispensable - almost. We did not need any tuition to be able to use the phone directory in print. Or even our telephone for that matter, or how to manage our contacts on a social platform. Maybe we had at times to ask some geek type among our friends. We probably don't have a clue how all this stuff works, but the main thing is that we are able to do with it what we want. And to do this, we will have to perform a series of repetitive actions, or retrace a procedure. We go by what is in the interface and follow the obvious traces of the algorithmic procedure laid down by others for us.

The organization of our cognitive system is mainly based on intuitive faculties and reasoning. Entrusting ourselves to intuition, we only interpret a context through mental schemes that are already part of our non-conscious mnemonic luggage. Cognitive and computational effort is minimal, since we do not think about what we're doing. We act automatically. Reasoning instead requires substantial cognitive effort, we must dwell on a problem, make hypotheses, follow a sequence which requires a slow pace and full involvement. Intuition allows us to act and to use a tool without being able to explain its operation, while the reasoning can make us able to explain exactly how something works without necessary being able to use it. A virtuosa violin player may have no idea how her muscles work, but she can use them to perfection. Conversely, we may be able to describe the steps to drive a tractor theoretically by reading a manual, without being able to actually drive it.

Declarative memory (knowing what, knowing something) is distinct from procedural memory (knowing how, knowing a procedure). All the activities we carry out automatically involve procedural memory. When we act intuitively we refer to the procedures we learned in the past, acting out the strategy which seems the most appropriate for the successful completion of the task at hand. We do not need to think. It is a question of ecology of resources, like not wasting valuable computational energy to think about how to ride a bike if you already know how to ride it. But when there is no match with our previous experiences, we must refer to reason and analyze environmental conditions before acting: if a tire is flat, we try to take it apart and fix it. But if we can't manage, we have to ask for help, or tinker with it otherwise, and create a fresh, not yet applied procedure.

In general, using a digital medium, e.g. a web interface, on an ongoing, daily basis, means to gradually learn to use it automatically. And as these interfaces are designed to give the most user-friendly, intuitive 'experience', it is easy to see how, through the creation of mental patterns, one can say that we use them "without thinking". Even if we switch to a different make of cellphone while using the same applications, suffices to identify its icons to go back to the automatic mode, and type in without looking at the keypad.

Once trained, the mind is able to repeat one the particular, earlier internal simulations of the action that we want to complete: intuitive ability is therefore the ability to simulate a known procedure and acting it out automatically. This automatism coincides with the execution of the procedure. From there springs most of the apparent misunderstandings regarding the educational benefits of the use of digital devices, and about cognitive differences allegedly existing between 'digital natives' and later adopters. A good illustration is provided by the fact that smartphones and tablets are used in the rehabilitation of patients suffering from neuro-degenerative afflictions such as semantic dementia. In their case, since procedural memory is the only kind of memory left to them, patients are able to master several functions and use the devices on a daily basis without problems even though they are otherwise unable to remember very simple notions.

"Digital natives" is in itself not a very valid concept, people born in the television age also can become proficient computer users, interact socially and engage in interpersonal relationships mediated by digital devices, and find experiencing and participating in multimedia interconnected realities more interesting than the "disconnected" everyday life. All moderately intelligent human beings can become "digital natives". A human brain is very plastic and is modify itself very quickly when learning procedures, and this is especially the case with gamification related procedures. But then, this does not mean that people are consequently able to comprehend, interpret, analyze, rewrite or teach the procedural mechanisms they themselves repeat routinely!

The more or less deep dive into a virtual reality penetrating our organic body through the optic nerves generates a detachment to our environment and a selective inattention to non-visual stimuli, as well as being addictive. And breaking away from the screen, after passing hours that have seemed to be minutes, can be felt as a real ache. Give us

the game back, even for a moment, just a moment, it was so fun! It is such a cool separation from the body. Here, it is the passage of time which constitutes the fundamental parameter to identify the different types of interaction. When we are not aware the passing of time, we are probably in a phase of flow [2], of procedural immersion. We are living in a current, immediate cycle of interaction, an extremely addictive experience, which we would like never to end. When on the contrary time is perceived as linear, with experiential stages we are aware of, and which we are able to stratify, to store and to recall later, we find ourselves in a time of sequential learning and of applying declarative memory.

By now, video games have become a fundamental part of the life of millions of people, who together spend billions of hours playing on or off-line. In terms of turn-over, the video game industry has overtaken all other branches of the entertainment industry: developing a successful video game, for instance a MMOG (Massively Multiplayer Online Game), in which participants connect simultaneously to play in a world that they create together, can be more expensive, and then turn out to be more profitable, than to produce a Hollywood blockbuster. Of course video games are not all the same but the vast majority are designed to induce flow. Besides bolstering the dopamine circuit, they can act on the release of oxytocin, which modulate fear and anxiety and induces prosocial behaviour, and has an effect on many other neurotransmitters and hormones.

Many video games are made following the prescriptions of behaviourism, and in particular the format of the Skinner box game, designed by the American psychologist Burrhus Frederic Skinner [3] in his experiments with rats and pigeons in the 1930s. Skinner developed a method of learning called operant conditioning. A particular type of behaviour will be prompted more successfully, even in the case of humans, by way of rewards granted in a non-automatic way. Thus, a rat will receives food if it presses a button, but not always. Training is more effective in that buttons will be pressed down more frequently if the positive reinforcement is not automatic, but possible or probable. A common example with humans is provided by gamblers at slot machines almost everywhere: players know that they will not always win, if ever, yet they continue to chip in, because the operant conditioning (I can win) is more powerful than immediate frustration (I did not win this time). Behavioural training is perhaps the greatest deceit in gamification, and it is standard to video games and in fact, any other type of game.

The interaction with digital media needs not necessarily to be limited to a mere self-training, an exercise in procedural memory and simultaneous intelligence or intuition. Hacking, the art to "put your hands on", to take over the operation of a complex operating system (hard- or software), to tweak it and alter its functioning at will certainly also appeals to the senses. Yet remaining dazed and (not) confused in front of a screen for a classic and self destructive "flying to Australia" session of 24 hours or more, until the body/mind collapses of exhaustion is a typical example of system-induced self-destructive behaviour abusing the self-reinforcing dopamine cycle making people forget their own organic body.

Thus we strongly aim to and advocate to a conscious and balanced back and forth between various forms of intelligence and memory. Care of the self starts with a careful observation of personal interactions, with listening to personal inclinations, this with the aim to be able to find the pace to suit us, and to be able to set our own rules. In other words, to create our own interactive "liturgy".

From self-defense to hacker convivial pedagogy

We do not want to give up on the game, to give up the pleasure of playing together. Indeed, we think that learning by playing is one of the finest ways to genuinely layer our experiences, to make them part of us. "Hands on" be our motto: for the pleasure of tinkering with machines, tweaking devices and systems, and doing it together, this is is the real joy. This activity in the first person, this pleasant interaction (some erotic thrill must be part of the game!) is a pre-condition of happiness for a hacker playing with technological tools.

In the course of our "s-gamificazione" workshops (de-gamification) we have developed a simple methodology to move towards a convivial pedagogy, playing with the machines we like. But then, we first have to get rid of the automatisms that reduce us to mere cogs of the corporate megamachines. To us, digital self-defense means above all to drop the habit of re-acting to gamification stimuli. As a start we have to change our habits in a conscious way.

It is not possible here to give an account of a typical workshop, because there is no such thing as a typical workshop. In our experience every group of people and every situation turns out to be radically different from any other. Also, very personal issues frequently come to the fore, and it is essential to keep these within the protected area of the group, away from the limelight. Thus we have tried to abstract the basic steps and elements of our workshops in order to give an account that runs as one and the same story, yet retold in many different ways.

The first step is to acknowledge the fact that we are immersed in interactive environments shaped by automatic devices we did not choose and which do not necessarily make us feel good.

The second step is to observe ourselves acting as if we were strangers, with weird habits – to look at ourselves in the shape of strange animals waiting anxiously for that message, getting irritated if it doesn't appear, getting elated by a like, bouncing when a notification pops up ...

Once we have identified the automatism (stimulus-response) that make us behave in a certain way, we focus the attention on the emotional changes that result from them. Anger, joy, sadness, excitement, impatience, envy, fear and many other emotions manifest themselves constantly, often in combination. There obviously exists an interactive design of emotion of which we are unaware.

The third step is to tell others, to people we trust, what we have discovered about ourselves, about our behaviours. This way we are not disclosing facts about ourselves on public notice boards owned by multinational corporation. On the contrary, we choose our own dedicated spaces and times to bring out the masks that enliven our personal interactive liturgy. The bundles of emotions which makes us take the character of an undecided person, or of a braggart, or of a shy individual, of a competent expert, and of many other possible types represents what has settled down in our individuality - without us noticing. Up to that point the positions "we answer like that" and "we act like this" - show us how much we have become enslaved to our own induced behaviors.

Finally, the fourth step is to compare our stories with those of others. Very often we find that our compulsive habits are very much similar to those of our peers, but we also discover that there exists a great many ways to make a change - as long as we do

really want it.

[1] «The Performance Society», in Ippolita, In the Facebook Aquarium, INC, Amsterdam, 2015, p. 23.

[2] Flow, or in the zone / in the groove. See Mihály Csíkszentmihály, Flow: the Psychology of optimal experience, Harper & Row, New York 1990.

[3] A brief introduction can be found in McLeod, S. A. (2015). Skinner

- Operant Conditioning. Retrieved from www.simplypsychology.org/operant-conditioning.html. The classic work is Skinner, B. F. (1953). Science and human behavior. http://www.bfskinner.org/newtestsite/wp-content/uploads/2014/02/ScienceHumanBehavior.pdf

De las tecnologías apropiadas a las Tecnologías Re-Apropiadas [35]

La inversión de recursos en el desarrollo de conocimientos orientados directamente a la producción o desarrollo de nuevos procesos y productos, convierte a la tecnología actual que consumimos, en un bien comercial. Su adquisición, transmisión y transferencia deja de ser un proceso informal del procomún, convirtiéndose en uno formal, sometido a las leyes e intereses del mercado, las patentes y los registros de propiedad intelectual. Por todo ello, se desarrolla mayoritariamente en grandes empresas, corporaciones, estados y gobiernos, y sus frutos son una mecanización excesiva, que promueve el desplazamiento humano obligatorio, desbasta los recursos e incrementa el absoluto desapoderamiento y conocimiento social sobre las tecnologías por quien las está usando..

La ausencia de capacidades científicas y tecnológicas, la falta de condiciones económicas propicias para el desarrollo de innovaciones, y el uso de un proceso inadecuado de introducción de tecnologías en los aparatos productivos, genera cambios económicos en las realidades y prioridades de los países y así también ineficiencias en la utilización de los recursos. El desbalance en el comercio de conocimientos provoca una gran diferencia entre países e individuos y pone en desventaja en las relaciones de intercambio económico, a aquellos que son netos importadores de tecnología o simplemente consumidores. La situación de dependencia y desigualdad en el desarrollo se observa cuando la fuente principal de tecnología de un país se ubica en el exterior, y cuando no se dispone de una capacidad local para generar y adaptar tecnologías propias. La importación de tecnología en si mismo no es forzosamente desventajosa, todos los países lo hacen, lo malo es la ausencia de políticas correctas de transferencia de los conocimientos asociados y las dependencias asociadas que se generan.

La introducción de una tecnología inadecuada, que no se comprende, en una comunidad o su adopción por un individuo, genera una dependencia tecnológica viciosa y una evolución económica incompatible con las necesidades sociales, convirtiendo esta dependencia en una causa, síntoma y consecuencia de la falta de

autonomía. La evolución y el cambio técnico en las economías de los países del mal llamado “sur global” es sustancialmente diferente a lo observado en los países del norte o bloque occidental.

Las desigualdades, sobretodo el desiquilibrio tecnológico que introduce el capitalismo puede mostrarse clave para incentivar la creatividad y cubriendo las necesidades a través del uso y el desarrollo de las tecnologías apropiadas, hacemos que la situación se vuelva reversible y que se generen nuevos procesos de autonomía imparables. Al fin y al cabo, ¿que comunidad no necesita que una tecnología sea eficiente, se comprenda y se adapte a su contexto medioambiental, cultural y económico propio ?.

Conceptos que se entrelazan

Una Tecnología apropiada (Appropiated Technology [1]), significa una tecnología adecuada y también apropiada, copiada, obtenida. Las tecnologías apropiadas pueden ser high o low tech, se construyen y distribuyen con licencias libres, GNU GPL, software libre y de código abierto y pueden darse en campos de acción variados desde la agricultura, permacultura, jardinería, y construcción hasta la comunicación, salud y educación,

El término originalmente surge del movimiento medioambiental anglosajón durante la crisis energética de 1973. En el libro “Small is beautifull” [2] el economista británico E.F. Schumacher, promueve el valor de la tecnología como salud, belleza y permanencia. En ese sentido, una tecnología apropiada describe aquella tecnología que mejor se adecua a situaciones medioambientales, culturales y económicas, requiere pocos recursos, implica menos costo, tiene un bajo impacto ambiental, no requiere altos niveles de mantenimiento, se genera con destrezas, herramientas y materiales de la zona y puede ser localmente reparada, modificada y transformada.

El término apropiado, como sinónimo de adecuado puede generar confusión. Una tecnología costosa puede ser la más adecuada en las comunidades saludables, con capacidad de pagar por su mantenimiento, activando de esta manera el flujo económico y concentrándolo solo en reforzar la dirección de quien más poder tiene.

En cuanto a Tecnologías Intermedias, estas pueden ser también apropiadas, y suelen describir una tecnología mucho menos costosa que la prevaleciente, construida utilizando materiales y conocimiento disponibles de forma local, fácilmente comprada y usada por gente con escaso acceso a recursos, los cuales pueden liderar aumentos productivos mientras minimizan su dislocación social.

El "Slow Design" [25] es un enfoque holístico del diseño que tiene en cuenta la mayor gama de factores materiales y sociales, más los impactos relevantes a corto y largo plazo. En "Slow Design", un paradigma para vivir de manera sostenible", Alistair Fuad-Lucas, desarrolla un diseño sostenible, equilibrando al individuo y sus necesidades socio-culturales y ambientales. El concepto se aplica a experiencias, procesos, servicios y organizaciones. Es un camino hacia la desmaterialización necesaria para la sostenibilidad a largo plazo, busca el bienestar humano y las sinergias positivas entre los elementos de un sistema, celebra la diversidad y el regionalismo.

Las tecnologías Re-apropiadas significan volver a dotarnos de la tecnología que necesitamos desde un posicionamiento político. Se trata de colocar la tecnología en el centro de la vida, dentro de un eje transversal donde se encuentran otras disciplinas como la ética, los problemas sociales, el medioambiente, y busca integrarlas todas en un conjunto, con una finalidad, la de preservar y defender la vida frente al poder, para que ésta no se quede oprimida. Cuando ponemos la tecnología en el centro no construimos forzosamente un mundo tecnológico como el actual, lleno de dependencias y frustraciones, y ataduras que desbalanzan el equilibrio entre el poder y los oprimidos.

Si nuestro deseo es realizar un cambio social hacia una sociedad más sostenible, colectiva, comunitaria y no puramente mercantil, debemos cambiar los medios, los recursos y las relaciones que actualmente sustentan una sociedad basada en intereses económicos, y devolvernos a nosotras, individuos y comunidades, mujeres y pueblos la parte expropiada de nuestro empoderamiento tecnológico, generando una tecnología y una ciencia, y una comprensión y divulgación de ellas que se enfoque hacia la vida, tal y como acontecía antes de la Revolución Industrial. Será necesario cambiar las estructuras y sobretodo aquellas que sustentan el conocimiento, porque si cambia todo el sistema y los procesos, pero no cambian las estructuras y las relaciones que se dan entre nosotras, entonces no cambia nada.

Una Tecnología Re-apropiada tiene una determinación política que sirve como grieta polar para fragmentar el sistema capitalista, privilegiando la creación de núcleos y pequeñas comunidades descentralizadas que favorecen los entornos de autogestión y en equidad ayudan a desarrollar una sociedad y una vida menos alienante y más integrada con los procesos naturales.

Las Tecnologías Re-apropiadas se implantan por los propios individuos y comunidades, no por gobiernos, quienes no pueden diseñar políticas sin ir al territorio y su trabajo es solo desde las decisiones gestoras de los despachos. Nosotras, necesitamos una Tecnología Re-apropiada a la industrialización, que incorpore a nuestras tecnologías, técnicas y cotidianidad, nuestras tradiciones ancestrales que inherentemente ya tienen una base medioambiental, sostenible y holística. Tecnologías para crear bienestar, belleza y comunidad.

Las Tecnologías Re-apropiadas desde la experiencia personal.

En los últimos diez años, he intentado llevar la teoría a la práctica, he ido adaptándome y cambiando de forma, he creado protocolos y licencias libres que defienden nuestras Tecnologías Re-Apropiadas, he intentado generar talleres colectivos donde se intercambiasen experiencias y habilidades y se pudiera crear una actividad productiva que cubriera las necesidades básicas y dotara de riqueza a las comunidades.

He descubierto un nicho de mercado existente para las Tecnologías Re-Apropiadas, un ejemplo para describirlo seria “para ser productivo y sostenible un productor ecológico de nueces o almendras, no tiene ninguna solución intermedia entre el cascanueces y la supermáquina de miles de euros. Las tecnologías re-apropiadas ocuparían este espacio, adaptadas al usuario y su entorno”.

En la sociedad y la mayoría de movimientos sociales no se ha defendido la tecnología, la ciencia y la soberanía tecnológica como práctica social, ni en lo individual ni en lo colectivo. El debate se vuelve minoritario y poco a poco se introducen en nuestra

cotidianidad nuevas tecnologías que nos hacen más dependientes y muy poco tienen que ver con las cuatro libertades. Por suerte siempre hay un grupo minoritario que lo revierte o lo cuestiona.

Todavía en la mayoría de los espacios tecnológicos, el grueso de participantes pertenece al género masculino patriarcal. La situación no se ha revertido aún y el machismo muchas veces se vuelve más feroz, porque no solo se da en los contenidos, sino en las formas, en el trato, en el ambiente que se crea de trabajo, de competitividad y de egos que no pueden ser tocados a riesgo de ser extremadamente victimizados. Ese machismo resulta más incidente porque partimos de un escenario donde existe un conocimiento sobre los trabajos de género, simplemente no se quieren cambiar los privilegios, o da miedo replanteárselos porque a veces resulta más fácil defenderse que trabajarse interiormente. Pongo un ejemplo real que me ha sucedido con dos gruístas

Situación A: Habíamos terminado un trabajo que era un remolque oxigenador [35] y tenían que llevárselo en grúa. Aparece un señor. Le coloca unas cinchas que al ser apretadas marcan un pequeño bollo la chapa del remolque que es de policarbonato celular. Le digo:

"-Disculpa, mejor le ponemos un trapo detrás de las cinchas para que no se marque, así llega perfecto a mi cliente. -No te preocupes, esto ya esta bien. Esto ya esta bien.- Me dice sin escucharme. Me doy treinta segundos para contestarle. -Oye, poner un trapo no cuesta nada -Que va, ya verás como te lo bollaran los del ferry, esto no es nada.-Sigue sin escucharme. Un minuto de respiración, bueno a ver reflexiono, soy la clienta, si le digo que ponga el trapo pues lo tiene que poner, ¿Porque tanta cabezonería? -Disculpa que mejor le ponemos un trapo. Y finalmente a regañadientes lo hace"

Situación B: Se me estropeó el coche en medio de la montañacon un frio tremendo y estuve esperando a que llegara la grúa. Apareció una chica gruísta, y dijo que mi avería se podía reparar si extraíamos un manguito. Ella no podía sacarlo porque se le congelaban las manos, entonces mi mano inconscientemente avanzó para ayudar a la suya. Ok perfecto, no se asustó, no dijo que la estaba entorpeciendo, simplemente me dió las gracias e intentamos sacarlo juntas.

La actitud inmovilista de la situación A no sucede en todos los hombres, ni la contraria en todas las mujeres. Las actitudes competitivas desarraigadas, inmovilistas, opresoras, desiguales, pertenecen al patriarcado y de ellas somos víctimas personas de cualquier género. La tecnología y la ciencia al ser una herramienta al servicio del poder, avanzan según las directrices del patriarcado y la sociedad capitalista.

Por lo tanto las Tecnologías Re-apropiadas deberían ser algo más que los objetos tecnológicos y las ciencias en si mismas, y ser también el conjunto de relaciones que se dan entorno a estos objetos. ¿Podría estar fabricando Tecnologías Re-apropiadas en un taller con un ambiente y una formas totalmente patriarcales? Yo creo que no, carece de sentido.

Para ello es necesario poner la tecnología en el centro de la vida, hablar de los pistones y las bielas, como hablamos de las recetas de cocina. Esto es lo que hace la Jineology [33], no separa el objeto del sujeto, los mezcla dentro de una relación sana, no como algo externo, sino como algo siempre mejorable y mutable.

Otro matiz de las tecnologías re-apropiadas radica en que como estas se aplican. Si utilizamos símiles de ejemplos cotidianos, por ejemplo podemos hacer nuestra cama simplemente o sacudir las mantas en la ventana, dejarlas aireadas al sol, cepillar el colchón para eliminar los roínes. Detrás de todos estos pasos hay técnicas para la mejora de la vida. Otro ejemplo sería al aplicar una crema hidratante, una cosa es darse una pasada con la mano. Otra cosa bien distinta es aplicarla con pequeñas instrucciones, los efectos son mucho mayores.

Lo mismo sucede con todo, todo tiene su técnica y ciencia detrás. Aprender estos pequeños hábitos no cuesta tanto. Llegar a incorporar las ciencias que mejoran la vida como hábito, no es necesario solo hacer, sino saber porque lo hacemos así...

Nombrando algunas Tecnologías Re-Apropiadas

En el campo de la Construcción existe una amplia diversidad de técnicas, el Adobe, Súper Adobe, la Tierra Clavada, el Ladrillo Holandés y la Mazorca entre otras. Todas se elaboran con materiales in-situ, relativamente baratos. Arquitectura para la

humanidad[10] sigue principios consistentes con la tecnología apropiada, orientando a personas afectadas por desastres naturales.

En el ámbito de la energía, el término "energía suave"[12] (soft energy) de Amory Lovins, describe energía renovable y apropiada. Estas suelen introducirse en comunidades aisladas y lugares con pequeñas necesidades de energía. . Existen los diseños off-grid[11], no conectados a la red eléctrica. Los altos costos de inversión inicial y la formación sobre su mantenimiento deben tenerse en cuenta. Se utilizan placas solares, caras inicialmente, pero simples, aerogeneradores o microturbinas en los saltos de agua,y esta energía es almacenada en baterías. Biobutanol, biodiesel y el aceite vegetal pueden ser apropiados en áreas donde exista aceite vegetal y sea más económico que los combustibles fósiles. El Biogas es otra fuente potencial de energía, particularmente donde existe un abundante suministro de desperdicio de materia orgánica.

En Iluminación, la Light Up World Foundation [13] utiliza LED y las fuentes de energía renovables, como celdas solares, para proveer de luz a personas con pocos recursos en áreas remotas, sustituyendo las peligrosas lámparas de queroseno. La Lámpara de Botella Segura [14] es una lámpara de queroseno diseñada en Sri Lanka, que cuenta con una tapa de metal y dos lados planos, para evitar que ruede en caso de ser golpeada.

En la Preparación de Comida, para reducir la labor requerida comparada con los métodos tradicionales, se utilizan tecnologías intermedias por ejemplo la Peladora de Maní en Malasia. En Cocina, las cocinas justas, los reductores de humo y las estufas eficientes, producen ahorro de tiempo, evitan la deforestación y generan beneficios para la salud. Briquette [15], desarrollados por la fundación Legacy [16], pueden transformar la basura orgánica en combustible. Las cocinas solares son apropiadas para algunas zonas, dependiendo del clima y del estilo culinario.

En Refrigeración, el Refrigerador pot-in-pot [17] es una invención africana que permite mantener las cosas frías sin electricidad por mucho más tiempo. Esto supone un gran beneficio para las familias que la utilizan , por ejemplo las chicas que venden conchas frescas en el mercado pueden ir al colegio dejando las conchas en el aparato y después ir al mercado.

En Agua, el Hippo Water Roller [18], permite cargar más agua con menos esfuerzo. El Cosechador de Agua de Lluvia, requiere un método apropiado de almacenamiento, especialmente en áreas secas, y el Colector de Niebla, es excelente para zonas donde la lluvia es escasa. En el Tratamiento de Agua, se requieren altos estándares cuando ésta necesita ser purificada antes de su uso. El agua silvestre puede ser lo suficientemente limpia, dependiendo de la profundidad y de la distancia de las fuentes de contaminación como las letrinas; el agua de lluvia puede estar limpia, si la zona de caída se encuentra libre de desperdicios, aún así es recomendable tratarla para remover cualquier posible contaminación. Los principales procesos son: filtración, biofilm, sedimentación, calor, luz ultravioleta, y la desinfección química, usando lejía.

Los filtros suaves de arena, proveen una alta calidad de agua tratada con una simple operación, usados tanto en naciones saludables como en comunidades pobres. Las semillas aplastadas de Moringa oleifera o Strychnos potatorum pueden ser utilizadas como fluctuantes, las impurezas son fácilmente removidas por sedimentación y filtración. El filtro de cerámica elaborado con arcilla mezclada con materia orgánica como el café, se encuentra en muchos hogares de Sud América. El LifeStraw [19] es un pequeño dispositivo que permite al usuario beber directamente agua sucia. Los filtros de ropa o la desinfección solar son precisos para su uso en pequeña escala, se requieren pocas jarras o botellas.

En Accesibilidad, la silla de ruedas Whirlwind [23] provee la movilidad deseable para personas que no pueden comprar las sillas usadas en los países desarrollados. En el ámbito de Sanidad, BiPu [20] es un sistema portátil de letrina apropiado para desastres. El proyecto Orange Pilot [21] fue una solución para la crisis sanitaria de barrios urbanos, el bajo costo de letrinas desarrolladas en las villas de Bangladesh, combatieron los problemas de salud ocasionados por la defecación abierta. Así también las camas Reed [22] para purificar las aguas residuales. La sanidad ecológica, se ocupa de los desechos humanos, con el objetivo es proteger la salud humana y el medio ambiente, con el uso del agua para el lavado de manos (y anos), reciclando nutrientes que ayudan a reducir las necesidades de fertilizantes artificiales.

Para el Cuidado de la Salud, el incubador de cambio de fase creado a finales de 1990, es una vía de bajo costo para generar muestras microbiológicas. Existen varias tecnologías apropiadas que benefician la salud pública; particularmente en el uso de agua limpia en la sanidad.

Finalmente, en el ámbito de las tecnologías de la información y comunicación, tenemos el 2B1[5] y el Simputer[6] computadoras orientadas a países en desarrollo, su principal ventaja es el bajo costo, la resistencia al polvo, fidelidad y uso del lenguaje de destino. ILDIS OnDisc [7] usa CDs y DVDs en áreas sin una conexión a Internet confiable ni dinero suficiente. Wind-up [8] de Jhai Foundation, donde la radio, la computadora y el sistema de comunicación son autónomos. Los teléfonos móviles también pueden ser tecnologías re-apropiadas en lugares donde la infraestructura comercial no puede o no quiere asegurar una amplia cobertura. Loband [9], web desarrollada por Aidworld, quita todas los contenidos intensivos de amplitudes de banda ancha y convierte a un simple texto; incrementa la velocidad del procesador y es apropiado para el uso de conexiones bajas de Internet.

Conclusiones

No hay una tecnología adecuada en términos absolutos. Según la ONUDI [26] se trata de "la tecnología que más contribuye a los objetivos económicos, sociales, y de preservación del medio ambiente, teniendo en cuenta las metas del desarrollo, los recursos y las condiciones de aplicación en cada territorio".

La tecnología adecuada hace uso óptimo de los recursos disponibles en un territorio para el máximo bienestar social de su población. Sectores de la economía con características diferentes, hacen tecnología diferentes. Es deseable permitir un patrón de desarrollo equilibrado, donde los recursos extraídos puedan ir regenerándose paulatinamente en equilibrio . Se deben generar productos para los niveles de ingreso y para los diferentes estilos de vida que existen. Cubrir necesidades, no generar necesidades. La pequeña escala resulta preferible frente a la grande .

La gestión adecuada se asocia a la generación, transferencia, adaptación, asimilación y difusión interna de la tecnología necesaria para lograr las metas sociales y económicas sin descuidar el equilibrio ecológico. Para alcanzarlas, debe existir un consenso y una organización que logre integrar un proceso continuo de gestión tecnológico, guiado con una estrategia que armonice el funcionamiento del sistema científico-tecnológico con la transformación y desarrollo del sistema productivo, una organización que continuamente este en cuestionamiento y que haga especialmente en la divulgación y educación. Por ello se debe partir desde la necesidades locales, en una estructura

descentralizada, de pequeños núcleos y comunidades con redes de confianza y reciprocidad estables. Si existe una estructura de gestión mayor en los países, esta deber recoger las necesidades de estos núcleos, de abajo a arriba. Los países e individuos pobres deben recordar que tienen la posibilidad de tener voz propia y la responsabilidad de hacer que se respete su poder de decisión en su evolución económica y social en un mundo interdependiente.

[1] Tecnología apropiada **http://es.wikipedia.org/wiki/Tecnolog%C3%ADa_adecuada** [2] "Small is beautifull"de E.F. Schumacher

[5] 2B1 **http://en.wikipedia.org/wiki/2B1_conference** [6] Simputer **http://en.wikipedia.org/wiki/Simputer**

[7] ILDIS OnDis **http://books.google.es/books/about/The_Transfer_of_Technology_to_Developing.html**

[8] Wind-up rdio **http://en.wikipedia.org/wiki/Human_power**

[9] Loband **http://www.loband.org/loband/**

[10] Arquitectura para la humanidad **http://architectureforhumanity.org/**

[11] Diseño off-grid **http://www.off-grid.net/energy-design-service-questionnaire-spanish/** [12] Soft Energy **http://en.wikipedia.org/wiki/Soft_energy_technology**

[13] Light Up World Foundation **http://lutw.org/**

[14] Lámpara de botella segura **http://tecno.sostenibilidad.org** [15] Briquette **http://en.wikipedia.org/wiki/Biomass_briquettes**

[16] Fundacion Legacy **http://www.legacyfound.org**

[17] Refrigerador pot-in-pot **http://www.mienergiagratis.com/energias/mucho-mas/mas-proyectos/item/66-p000028.html**

[18] Hippo Water Roller **http://www.hipporoller.org/**

[19] LifeStraw **http://eartheasy.com/lifestraw**

[20] BiPu **http://en.wikipedia.org/wiki/BiPu**

[21] [22]

[21] Orange Pilot [22] Camas Reed **http://www.wte-ltd.co.uk/reed_bed_sewage_treatment.html**

[23] Whirlwind **http://www.whirlwindwheelchair.org/**

[24] Cloth Filter **http://en.wikipedia.org/wiki/Cloth_filter**

[25] Slow desig **http://en.wikipedia.org/wiki/Slow_design**

[26] ONUDI, Organización de las naciones unidas para el desarrollo industrial http://unido.org

[27] **A Guide for the Perplexed http://www.appropedia.org/A_Guide_for_the_Perplexed**

[28] **Alternative technology http://www.ata.org.au/**[28] **Alternative technology http://www.ata.org.au/**

[29] **Eco-village http://www.ic.org/pnp/cdir/2000/08ecovillage.php**

[30] Tecnología y subdesarrollo , Stewart, Frances 1983.

[31] Tecnologías apropiadas o manejo apropiado de las tecnologías Flit, Isaías

[32] **Slow Design' - un paradigma para vivir de manera sostenible?** Fuad-Luke Alistair

[33] https://comitesolidaridadrojava.wordpress.com/2015/02/19/por-que-jineology-reconstruir-las-ciencias-hacia-una-vida-comunitaria-y-libre/

[34] Tecnología adecuada, Heberto Tapias García

> [35]. Se cuenta con un texto mas largo de este articulo en el siguiente enlace: http://elleflane.colectivizaciones.org/wp-content/uploads/2017/02/Tecnologias_reapropiadas2017.pdf ↩

Hacklabs to technological cooperatives

Techno-political collectives mix technical and political concerns. A perfect example is Riseup which defines its mission as a provider of "online communication tools for people and groups working on liberatory social change. We are a project to create democratic alternatives and practice self-determination by controlling our own secure means of communications". Nowadays the field is composed by very different types of organizations ranging from loose and informal networks of hacktivists, free software communities, formal organisations such as foundations, start-ups invested in the so-called civic tech and even public institutions and council towns.

Some years ago, technological sovereignty *meant* the development of free technologies [0] by and for the civil society. Empowering society by developing tools, hardware, services and infrastructure that meet social needs based on the ethics of free software and self-management. Nowadays, with the transition to open source things have become messy as big corporations promoting open source software basically for their own benefit have broken the relation between technological development and social responsibility.

In this text I will rethink what role cooperatives have, or could have, as economic and social actors in reclaiming this relationship. To do so, I will depart from the broad galaxy of techno-political collectives[1], and then focus on the format of technological cooperatives as they have been deployed in Spain.

A galaxy of initiatives

We find foundations which can be committed to create open source and free software solutions and services (FSF, Mozilla, Blender, etc.) and/or to protect and defend digital rights (Electronic Frontier Foundation, La Quadrature du Net, X-net) mobilizing and pulling economic resources to make those project run in the mid and long term. People can support foundations as a donor, volunteer, intern. They

normally look for experienced and qualified professionals and count with formal and legal structures when many techno-political collectives are based on informal groups and communities.

Another weird aspect of the current scene consists in local government initiatives which are working towards openness and transparency based on citizenship participation. Many “rebellious” council towns located in Spain are supporting the development of free software tools focused on political participation citizen driven[2], and behind those developments, freelancers, small companies and cooperatives are working on setting up viable, robust and trustful systems to promote open democracy.

Technological cooperatives can be found at the intersection of both previous options as they have an economical goal aiming towards sustainability and also a political and social approach to technology. Besides, as most of their clients come from the third sector (non profit oriented as NGO’s, associations, collectives) they can help build products based on their specific needs and desires. For examples[3], Candela (Amensty’s activist management app), GONG (NGO’s project/budget manager), Oigame (online petition platform), Nolotiro (platform to exchange of things), Mecambio (repository of energetic, financing and connectivity alternatives).

Creating a coop...

From now on, I will focus on the particular story of how we founded a free software cooperative, Dabne, in Spain but simultaneously others were doing the same [4]. In the 90’s, when Internet started to be accessible, several projects [5] wonder what it meant to escape from established identities, self-organize online transgressing borders, create a collective brain. Hacklabs, in squats or association offices, were places to experiment, learn about things that were not easily available as not everyone had an Internet access yet, nor a computer. Until then hackers were barely visible and hacklabs became that meeting point where “isolated” hackers meet social movements. A passionate hybrid came out of that, it knock a strong free/libre software community which had a high impact on society’s approach to free technology.

Spain has quite a long tradition of agricultural and industrial cooperatives and at some point, some of us started thinking that our hobby could turn through cooperativism into a way of living. As each cooperative have their own agreements regarding work and labour I will share the terms under which we founded our own:

- We wanted to make a living but not at all costs
- We wanted a shared making decision process
- We wanted transparency
- We wanted to define our goals, and change them when needed
- We wanted everybody to be treated equal and in a fair way
- We wanted to continue learning, have fun and promote free software
- We didn't want to be slaves of our work but work with others in a collaborative and cooperative way

With that in mind, we analysed how the "enterprise world" worked and wonder if we could become "business people" doing something that until then we did for free. A key element lied in the belief that we were going to found companies and step into "the market", that thing governed by capitalist rules which we were deeply against. Vertigo. There were no previous references of free technology cooperatives neither money to invest (we needed 250€ each). There was a strong determination and will to not work for big capitalist companies that make you uniform, dull and slave of their rules. The libre/free software community was there so we were not alone, we had our computers and skills, our beliefs that free technologies empower society, that free software brings sovereignty and that the digital era should make knowledge accessible, open doors to people and bring democratic alternatives to societies. We were choosing a way of living not just a job.

Dabne was founded in 2005 and it took us one year to understand what it meant to create a company, to manage a business and to decide a legal form that would favour our values of collaboration, transparency and responsibility. We went to workshops, talks, trainings, wrote business plans, attend appointments at the Chamber of Commerce. It seemed endless but little by little things began to take shape.

Becoming a coop happens in a specific environment of cooperatives advisers which is by far more friendly and easy to ask than in the start up world for instance. Mantras like "success", "fame", "competitiveness","big profit" are not part of their

vocabulary. They gave us a social approach, an understanding of how to address our impact and empower social organisations in the technical aspect.

Our friends xsto.info had founded one year before a free software cooperative in Madrid, they were a small group of sysadmins, web developers, wireless experts also committed to the free software community. Their experience helped us, we could share our doubts, difficulties, and see how others had gone through similar situations.

All in all, we managed to set up the company, and one good thing about software is that to start up, you basically need nothing but knowledge, a laptop and Internet access which means that costs are minimum, but the first challenge is to get the first clients. Through friends and contacts, we started our way, then the word spread word to mouth and slowly we had our group of clients.

Our mainly technical profile made us look for alliances like with noez.org focused on design and innovation centred on people. With them we could share different perspectives of technologies and made our work more understandable. Then Dabne became in an unplanned way a womens' free software cooperative. So far we do not know of any other women’s software development cooperative in Spain. This led Dabne to IT counselling, as active listeners we could make technologies comprehensible to non-technical people, adjust projects rhythms, be honest and able to say no when we cannot do it.

Building multi-verse of communities and networks

Cooperatives are most of the times fragile. But by working together, building and taking part of existing communities, creating and nurturing networks, they can strength their resilience and sustainability over time.

Through a platforms' cooperative (UMCTA) we got in contact with environmental, agroecology, social work and social advisers cooperatives willing to share their longer experience and knowledge. To become a coop also meant to enter the social and solidarity economy community[6]. At that time Coop57-Madrid, an ethical financial service cooperative was founded and its goal has been to finance social and solidarity economy projects thanks to investments from the civil society.

Red de economía alternativa y solidaria (REAS) and the social market, are networks for the production and distribution of goods and service based on the principles of social and solidarity economy. Among those we found social transformation, environmental sustainability, commons, gender equality, transparency, participation, self-organization, internal democracy.

Interestingly, most social and solidarity economy networks share a lack of interest towards technopolitical issues, making difficult to include free software cooperatives concerns in their agenda. Because of this, technical cooperatives set up decided to promote the use of free software and free technologies in 2007 with the Initiative "Software libre y ONGs". Call for breakfasts while having short talks complemented with a conference focused on Free/Libre software and Third sector organizations. At a bigger scale, in 2008, the Federal Association of Free software companies (Asolif) and other platforms[7] were created for promoting free software, create new business models and achieve responsible wealth.

On the other side, communities were built around each specific technologies, programming languages, content managers, OS distributions or hardware, in order to advance knowledge, share good practices, come up with improvements, and welcome newbies. *A small cooperative uses several technologies, the best option would be to take part on the different technical communities and attend to their corresponding events (conferences, meet-ups, etc). But being able to take part of IT community events requires people, time and money, which is very difficult to handle in a small cooperative with limited resources...*

Time has shown that new people are founding cooperatives and collectives[8] around free technology, so the wheel keeps rolling.

SWOT for coop

I will recap dimensions introduced previously using a Strength Weakness Opportunities threats (SWOT) analysis where:

Strengths refers to characteristics and internal factors of the cooperative or project that give it an advantage over others:

Small team can change and adapt quickly

Flexible working environment (home, office, client's office)

Ability to make decisions and define company goals

No initial capital needed

Define own timing

Good corporate image

Creativity

Curiosity

Have fun

Weaknesses refers to characteristics of the cooperative or project that puts it at a disadvantage relative to others:

Strain of working

24/7 involvement

No business management experience

No specialized profiles

Difficulty to grow

Communication

No financial cushion

No legal counselling

Opportunities refers to external factors of the environment that the cooperative or project could exploit to its advantage:

Able to develop own ideas & projects

Ability to chose partners & projects

Be part of different networks & communities

Capacity to respond to concrete and uncommon needs and desires

Threats are external elements in the environment that could cause trouble for the cooperative or project:

Exhaustion and burn out

Uncertainty about future

No update on technical issues

Price reduction

Now some open questions remain

Cooperatives can make possible the building of new autonomous zones meanwhile carrying out many challenges:\ Economy: how to shape an economy of the commons, social and supportive?

Self-organization: how to be sustainable in a long term run, while questioning unquestionable truths like, consensus, horizontality, participation, leadership?

Technological freedom: how to fight for free software, digital rights, open knowledge and copyleft?

Years passing by, technological cooperatives still looks like a small field based on strong personal relationships which are key in building trust and assuming new challenges but that can be also a limitation when there is a need to scale up. Besides, the precarious and uncertain economic situation makes difficult to integrate new people. However there is always a moment when the project grows and with it, should the team grow, how …. or not?

Then who should be part of the cooperative? Should they have specific technical skills? Should they have a versatile profile? Are always technical skills needed? Is it affordable and ethical to have apprenticeships?

And what about decision making processes? Cooperativism is about sharing the decision making process but experience shows that not everyone wants to take part of it, should they be excluded from the cooperative? Is the ability to make decisions key to be part of a cooperative? Should all decisions be taken in common?

These challenges gives a comprehensible vision of the times to come, and the creation of these autonomous zones opens possibilities to different ways of understanding work, the commons, sustainability and economy.

Footnotes

[0] As a reminder, free technologies, in a nutshell are the technologies and services based on the freedom given by free/libre software and it's philosophy:

Freedom 0: The freedom to run the program for any purpose.

Freedom 1: The freedom to study how the program works, and change it to make it do what you wish.

Freedom 2: The freedom to redistribute and make copies so you can help your neighbour.

Freedom 3: The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits.

[1]

http://riseup.net (USA)

http://autistici.org (ITA)

http://www.free.de/ (GER)

http://so36.net (GER)

https://www.boum.org/(FR)

http://nodo50.org (ESP)

http://pangea.org/ (ESP)

https://www.immerda.ch/ (CH)

https://mayfirst.org(USA)

[2]

https://github.com/AyuntamientoMadrid/consul

https://github.com/AjuntamentdeBarcelona/decidim

[3]

Candela: https://github.com/amnesty/candela

Gong: https://gong.org.es/projects/gor

Oigame: https://github.com/alabs/oigame

Nolotiro: https://github.com/alabs/nolotiro.org

Mecambio: http://www.mecambio.net/

[4]

Dabne - http://dabne.net

Xsto.info - http://xsto.info/

aLabs - https://alabs.org/

Semilla del software libre - http://semillasl.net/

Enreda - http://enreda.coop/

Gnoxys - http://gnoxys.net/

Grupo Ikusnet

[5] Some of the projects:

http://sindominio.net (ES)

http://autistici.org (IT)

http://samizdat.net/ (FR)

http://espora.org (MX)

http://thing.net (USA)

[6]

http://coop57.coop/

http://www.economiasolidaria.org

https://madrid.mercadosocial.net/

http://tangente.coop/

[7]

Asolif http://www.asolif.es/

Esle - http://esle.eus/

Olatukoop - http://olatukoop.net

Some other cooperatives, groups or initiatives working around free/libre technology:

[8] Deconstruyendo - http://deconstruyendo.net/

Interzonas - https://interzonas.info

Talaios - http://talaios.net

Shareweb - http://shareweb.es

Reciclanet - http://www.reciclanet.org

Buenaventura - http://www.buenaventura.cc/

Itaca - http://www.itacaswl.com

Saregune - http://www.saregune.net

Cooptecniques - http://cooptecniques.net/

Latino América

Kefir - https://kefir.red/

vedetas - vedetas.org

Cooperativa tierra comun - https://social.mayfirst.org/tierracomun