Supplemental material

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Tob Control

Appendix I. Search terms

To search the internal tobacco industry documents released to the authors:

Advocacy champions
AIT + protocol
AITP
Alphanumeric code
Article 15 + FCTC
Atos
Champions
Codentify
DCTA
Digital tax verification
Double playing
Engagers
FCTC
Global engagement plan
INB*
Influencer markets
Product marking technology
Protocol
Supply chain
T&T
- in addition to six names of BAT employees and government officials

To search the Truth Tobacco Industry Documents:

BAT + illicit trade + protocol
BAT + protocol + FCTC + illicit
BAT + supply chain + protocol + FCTC
Protocol to eliminate illicit trade in tobacco products
FCTC protocol on illicit trade

Appendix II. Coding themes

On the ITP	
Resistance	Arguments/statements against the ITP (e.g. viewed as a "threat", "expensive inconvenience")
Support	Arguments/statements in favour of the ITP (e.g. "strongly support")
Focus of engagement	Components of the ITP that BAT focuses on, e.g. specific issues, overall approach
Methods of engagement	Activities planned/carried out to engage key stakeholders on the ITP
FCTC engagement	Influencing the ITP through lobbying ahead or during INB sessions
Signing/ratifying	Attempts to influence governments to ratify; attempts to influence government *not* to ratify
On DTV/T&T	
Technology	Specificities of DTV/T&T solutions (e.g. BAT, Codentify) and their flaws (code cloning, code migration, code recycling, production with no codes, etc.)
Language (Reputation management)	Language used to promote Codentify (e.g. "expert", "solution")
Policy interference	Strategy vis-à-vis governments to shape policy decisions, legislation, and implementation
Suppliers	Providers of Codentify (e.g. FractureCode, ATOS) and links with BAT and other TTCs; claims of independence
DTV/authentication vs T&T	Steering technology, BAT discourse, and policy decisions towards DTV/authentication at the expense of T&T systems that effectively monitor products across entire supply chain
Paper tax stamps vs digital solutions	Arguments made in favour of paper stamps and against digital solutions, strategy behind it, and engagement efforts with policy makers
Efficiency	Stressing the low-cost, low-impact dimensions of DTV/T&T as key arguments in favour of those systems (at the expense of effectiveness)
Intra-industry cooperation	Cooperation with other TTCs, e.g. on Codentify itself or lobbying governments
Inter-industry cooperation	Cooperation with other industries, e.g. pharma, alcohol, food etc
IGO cooperation	Cooperation with Interpol (e.g. Global Register), UNODC etc
Service providers	Contractors hired by BAT to conduct a range of AIT services including lobbying governments, FCTC etc on T&T/DTV
Undermining competition	Lobbying against SICPA and other alternative DTV/T&T technologies

Appendix III. Codentify's main flaws

Industry-controlled
- The ITP (article 8.12) stipulates that T&T "shall not be performed by or delegated to the tobacco industry".[1]
- The Codentify technology was designed in a way to retain control in the hands of the manufacturer:
    - "only the number of codes and not the codes themselves are communicated [to the government]"[2]
    - "as product authentication is a brand protection issue, the choice of what is appropriate and which specific technology is used should be determined by the manufacturer (…) All [authorities] will need to do is contact us to provide the code and we will confirm whether or not the product is genuine."[3]
    - "under the existing Codentify model, the code, once created, is transferred to the tobacco manufacturers, who can still in some way control – and certainly print – the code, currently without any external controls."[4]
    - Manufacturers share partial data periodically.[5] – "Codentify doesn't transmit any numbers back and forth to the central server since the numbers are created locally via unique double key encryption and only the manufactured volumes are reported back to the server on periodical basis"[6]
    - Manufacturers are able to turn off Codentify on production lines.[7]
- TTCs have retained close links with Codentify/Inexto: Codentify was created by PMI in the mid-2000s following the EU agreements. In late 2010, it was made available freely to BAT, JTI and IB. The TTCs worked together via the Digital Coding and Tracking Association (DCTA) to lobby for Codentify as an alternative to paper tax stamps. The TTCs later relied on FractureCode and ATOS as approved suppliers to promote and implement Codentify while retaining links with them. DCTA reportedly sold Codentify to a company called Inexto. Though TTCs claimed Inexto was now independent and thus complied with the FCTC, key Inexto officials previously worked for TTCs for many years, and PMI has retained a number of Codentify trademarks.[8]

Ineffective:
- No external, independent third party has conducted a vulnerability assessment of the Codentify/Inexto solution, which means that all information relating to system security is unknown to anyone outside TTCs.[7]
- Phantom shifts: Production can proceed without codes.[7]
- Code cloning: the Codentify patent itself acknowledges that a limitation of identifying traded goods "by a production code, or serial number, impressed on the package is that the production codes can easily be imitated or cloned"[9] – an issue which the Codentify technology does not effectively address, as pointed out for instance by Kenya Revenue Authority (KRA) officials to BAT officials.[10]
- Code recycling – or printing valid codes on illicit products[11]
- Code migration – or reprinting codes from one country to another[11]
- Security issues: a BAT employee noted that revenue authorities in African countries "would all prefer a supplier/integrator who can supply both DTV and

paper stamps so there is a contingency during change over and in the event of system failure due to the Continents current lack of infrastructure compared with Europe or the Americas"[12]

- "the Codentify system uses relatively unsecured commercially available equipment on sites where operators may have a vested interest in misusing it."[4]

Inefficient (time consuming and costly for law enforcement):

- Verification via an online network "pertains only to the legitimacy of the printed code, not the legitimacy of the product itself"[13];
- In the rare event that authorities find a duplicate code along the supply chain, "the only way to determine the legitimacy of a product is to rely on the tobacco industry's forensic analysis"[13]
- KRA officials flagged "the inability for on spot enforcement due to further investigation requirements".[14]
- Ross et al (2018) estimate that given the possibility of "harvesting" codes, including via data breaches into a Codentify server or copying codes from the retail market, in a relatively small market (e.g. 1 billion packs sold per annum), a law enforcement authority would have to inspect over 27 000 (almost 31 000) individual packs per week to have a 90% (95%) certainty that it did not miss a fraudulent pack under the Codentify system. In contrast, a material-based T&T solution would require only 45 (59) pack inspections.[13]

Not track and trace:

- Codentify focuses on authentication (to guard against counterfeit products) and tax verification instead of T&T[15-18] (Figure 1)

Figure 1[19].

Caption (within figure): Terms & Definitions — DCTA — Issue, Scope, Solution, Technology
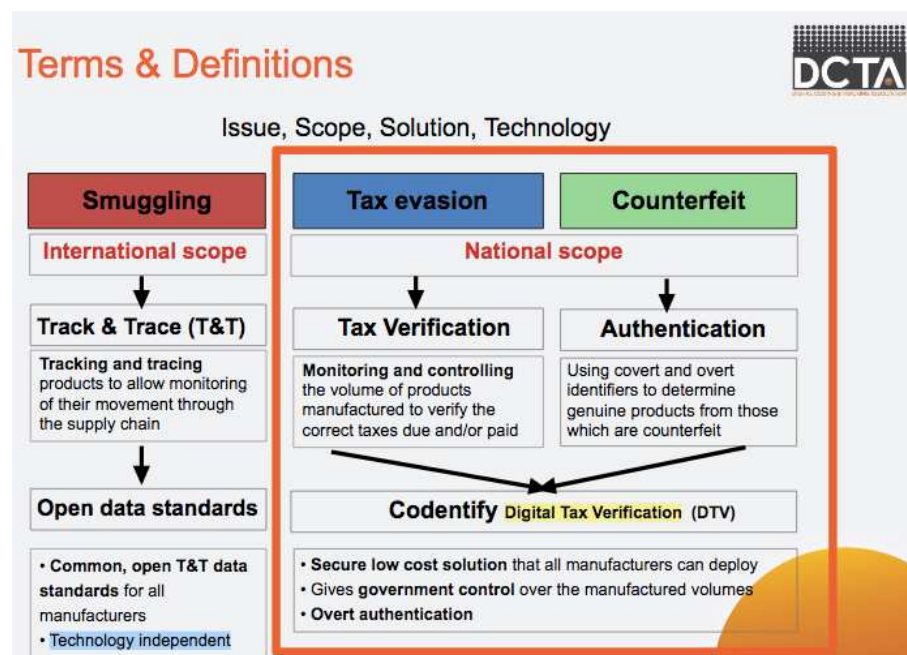
Opaque:
There is no information available as to what more recent iterations of Inexto products (if the technology has indeed been updated) actually look like.

In short, Codentify offers is an industry-affiliated product, which was designed to be "low-cost", "low-impact" for manufacturing, and one which requires significant involvement from the industry when a potentially illicit product is identified by authorities. It does not effectively secure the supply chain.[20i]

References

1. World Health Organization. Protocol to Eliminate Illicit Trade in Tobacco Products 2013 [Available from: https://www.who.int/fctc/protocol/en/ accessed 5 April 2020.

2. British American Tobacco. Enhancing Supply Chain Security and Fighting the Illicit Trade in tobacco Products, January 2010, 2010.

3. British American Tobacco (Holdings) Limited. Illicit Trade: examining the problem and advocating solutions, February 2010.

4. International Tax Stamp Association. Why Codentify Can Never Work as a Secure Track and Trace Solution Under the WHO FCTC Protocol and EU Tobacco Products Directive Undated [Available from: https://www.tax-stamps.org/userfiles/files/ITSA%20Positioning%20Statement%20on%20Codentify.pdf accessed 14 November 2017 2018.

5. Why It Is Bad - Tobacco Track and Trace. Interview with Tobacco Industry Insider Regarding Codentify 28 May 2015 [Available from: https://www.youtube.com/watch?v=XQ7gZ_D_WMM accessed 19 Dec 2016.

6. Rasmussen J. Re: Draft letter to KRA, 23 April 2012.

7. Interview 2: trade and customs expert, October 2019.

8. Gilmore AG, Gallagher, A.W.A., Rowell, A. Tobacco industry's elaborate attempts to control a global track and trace system and fundamentally undermine the Illicit Trade Protocol. *Tobacco Control* 2019;28:127-40.

9. European Patent Office. Document made available under the Patent Cooperation Treaty (PCT). International application number: PCT/IB2005/003103 20 Mar 2006 [Available from: https://register.epo.org/documentView?number=IB.2005003103.W&documentId=id00000002615337 accessed 22 Nov 2017.

10. Unknown. MEETING WITH KRA OVER DTV, 06 March 2012.

11. Framework Convention Alliance. Codentify: The tobacco industry's trojan horse: Framework Convention Alliance Bulletin, Issue 130, Conference of the Parties, day 5, Delhi, India; 11 November 2016 [Available from: http://www.fctc.org/publications/meeting-resources/cop7-bulletins/1490-codentify-the-tobacco-industry-s-trojan-horse accessed 17 November 2016.

12. Hopkins P, Ramoly N. Fw: FractureCode support for Kenya, 25 April 2012.

13. Ross H, Eads M, Yates M. Why governments cannot afford Codentify to support their track and trace solutions. *Tobacco Control* 2018

14. Hopkins P. Re: Update for KRA engagement on DTV, 7 March 2012.

15. Philip Morris International. Codentify: protecting Government revenues, securing the supply chain, fighting illicit trade (brochure), 2012.

16. Fracturecode, Rasmussen JJ, Carlsson L. CODENTIFY: THE PROVISION OF DIGITAL SOLUTIONS FOR REVENUE PROTECTION. Executive Presentation to the Representatives of: Democratic Republic of Congo Ministry of Finance, Mauritius Revenue Authority, Uganda Revenue Authority, Nairobi, October 2011.

17. British American Tobacco. Draft proposal for EABC, Undated.

18. British American Tobacco Kenya Limited. Cigarette excise tax proposal for fiscal year 2012/13, March 2012.

19. Hill M, Digital Coding and Tracking Association. Integrated Solutions to secure the Supply Chain, Guangzhou, 25 Nov 2011.

20. Fracturecode, Tepoz G, Hernandez JS. CODENTIFY ® THE PROVISION OF DIGITAL SOLUTIONS FOR REVENUE PROTECTION. Executive Presentation to the Ministry of Finance Asunción, 08 September 2011.

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i FractureCode presentation from April 2012 notably stresses its "Low set-up costs", "Low operational and maintenance costs", "low impact on productivity"