

On the referendum #22: Some basic numbers for the Vote Leave campaign

'The power of their £350 million a week can't be overstated. In focus groups it is quite unusual for floating voters who aren't very interested in politics to have internalised a campaign fact or number that it comes out spontaneously, and it did.' Andrew Cooper, director of strategy for the IN campaign.



'Once we strip out the effect of the various methodological changes that the companies have made ... every single pollster has registered a substantial swing to Leave [since 27 May]. It would appear that, whatever emerges from the ballot boxes tonight, it is Leave that won the referendum campaign.' John Curtice, 23 June 2016.

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It will be useful for those studying the referendum to have a sense of some important numbers. There are subjects left out below such as the polls which I'll deal with separately. All numbers should be treated as approximations. I have not gone through our official audited accounts which will be published by the Electoral Commission. Those numbers will obviously be the right ones. Below is what I happen to have on my computer. Some of it will be wrong. I have not gone through my paper records yet. We operated in extreme conditions, I did not prioritise keeping records, and people scattered quickly after the 23/6 including me.

Some numbers are in dollars because that's how we were billed by AIQ, an excellent Canadian digital agency we used. Anything to do with numbers and social media is fraught. People make all sorts of claims in this area, sometimes dishonestly and often in error (the claims from Leave.EU are of both sorts). The media is not equipped to sort facts from bullshit and it is all made harder to understand by many of the big companies themselves. Often it was impossible to find out from any employee of company X in Europe what exactly Y meant and our data science team resorted to speaking to the actual coders of company X in California to try to figure things out. Sometimes the companies themselves misreport their own data. (Facebook admitted to having some serious problems with data reporting after 23/6.) On top of that the most useful information is proprietary. It is impossible for the political media as now constituted to figure out what is really happening in this field.

This should be a focus for newsrooms, editors, and owners as the issues around data science and social media are only going to become more and more important with each election cycle. Some pundits have written that a lesson of Trump's victory is that data and data science will become less important in politics. This is not just wrong it is the opposite of the truth, not just regarding Trump's own campaign but in general, as will become obvious. Another factor driving this trend is the problems with traditional polling. We partly, but only partly, got around this problem by developing some new polling methods that operate on completely different principles, including different maths to the basic statistics used in standard polling since the 1930s, which also allowed much better social media targeting than normal polling. Others will do the same. Media companies will also transform their use of data. All this will increase the importance of data science.

Still, the rough numbers will be useful. Discussion of politics tends towards false dichotomies: 'data is the vital battleground', 'data is snake oil'. This is exacerbated by the fact that pundits are sensitive about the invasion of their field by people with quantitative skills, as every field has been in history (e.g. the strong resistance of doctors to randomised control trials took decades to break down and still persists). Can you understand the campaign just with data? Of course not. Can sensible use of data enrich understanding? Of course it can. Can intelligent use of data make a difference between winning and losing? Of course it can but every campaign is different. Can failure on other fundamentals outweigh advantages viz data? Of course it can - Hilary is the latest lesson in how the failure to develop a psychologically compelling core message can sink a campaign with huge advantages and resources. These numbers enrich understanding of the campaign but they are only part of the story.

One story the data does not show is the benefits of 'good will'. I operated and told others to operate on the principle 'with a pirate a pirate and-a-half, with a gentleman a gentleman and-a-half'. There were a few pirates: Cameron, Osborne, Jenkin, Farage, Banks etc. Our relationships with them got much more attention than the good will of thousands of people who made huge efforts and made many sacrifices for us. Some people we were generous towards unexpectedly proved crucial and we were repaid many times over. We valued our staff on the ground and they more than repaid our trust - people like Tom Huxley far from London made huge efforts, often unpaid, partly because of positive relationships developed with HQ. These network effects are impossible to quantify but they felt like they made a big difference and in such a close contest maybe the crucial difference. The ludicrous SWI infighting had many negative effects and one of them was it eclipsed the millions of positive interactions in our network. This included interactions on the ground between groups whose leaders were feuding in London - on the ground most people ignored this including thousands of UKIP activists who cooperated with *Vote Leave* contrary to Farage's explicit orders not to do so.

If the vote had been in 2017 and VL had been allowed to build a movement as we wanted with say half the level of in-fighting - very unlikely, much more likely that a delay until 2017 would have seen the rapid destruction of VL and a comfortable win for Cameron - then we could have built an unprecedented movement combining grassroots and technology. We did what we could given the constraints. Technologically we made some important innovations, including the first web-based canvassing software that actually works properly in the UK and its integration into world-leading data science modelling to target digital advertising and ground campaigning, but UK political organisations have only scraped the surface of what is possible.

If you know something here is wrong then leave a comment or email. I will republish a corrected version after I get better information including from some staff and consultants.

Campaign data spans roughly 11 orders of magnitude

10^{-2} - cost of a single paid digital ad 'impression' $\approx \$10^{-2}$, or 1 cent ($\sim \$3.6 \times 10^6 = \sim 3 \times 10^8$ paid impressions during 10 week campaign). NB. 'impressions' can be a very misleading metric unless you know exactly what you are referring to and why. Each company has its own definition and they often change. Companies have an interest in defining them in such a way as to inflate apparent audiences (see below). We paid about £0.02 per text to send half a million texts on 22-23 June.

10^{-1} - cost of getting someone to watch all of a paid short video $\approx \$10^{-1}$, ~9 cents.

10^0 - number of basic VL plans: we launched October 2015 with a simple focus on a psychologically compelling message based on the NHS and stuck to it because the data supported it.

10^1 - number of people who controlled important parts of the official campaign including Stephen Parkinson, Paul Stephenson, Nick Varley, Victoria Woodcock, and Henry de Zoete.

10^2 - number of VL HQ staff for the official 10 week campaign ≈ 100 ; there were another ~40 paid Ground staff (not working at HQ) of whom 90% were hired after 1 January 2016.

10^3 - number of full or part-time people (paid) plus unpaid part-time staff officially working for VL including 641 constituency coordinators who organised local volunteers. VL had ~1-2,000 campaign sessions per week across the country over the last 10 weeks (gradually accelerating).

10^4 - number of activists who did something useful roughly every week $\approx 12,000$ (31,000 total volunteers).

10^5 - money spent on traditional advertising $\approx 300K$.

10^6 - money spent on social media advertising $\approx £3.5m$. Number of a) emails collected + b) mobile numbers $\approx 10^6$. In the last three weeks activists were delivering leaflets at a rate of over 2.5 million per week. VL activists knocked on about 2 million doors.

10^7 - total amount of money raised and spent £13.7m. Number of targeted GOTV leaflets $\approx 16m$.

10^8 - total number of leaflets delivered by VL ≈ 120 million, half via activists and half via post.

10^9 - number of 'impressions' served by VL digital communications was ~1.5 billion of which Facebook was about 1B. This does not include web traffic (see caveats above).

The odds

During the ten week official campaign the implied probability from Betfair odds of IN winning ranged between 60-83% (rarely below 66%) and the probability of OUT winning ranged between 17-40% (rarely above 33%). Betting markets on the referendum and Trump showed no useful information. They simply reflected (flawed) polls until real votes came in.

Graph: Betfair odds.



NB. Something to ponder: a) hedge funds were betting heavily on the basis of private polling and b) I know at least two 'quant' funds had accurate data (they had said throughout the last fortnight their data showed it between 50-50 and 52-48 for Leave and their last polls were just a point off), and therefore c) they, and others in a similar position, had a strong incentive to *game betting markets* to increase their chances of large gains from inside knowledge. If you know the probability of X happening is much higher than markets are pricing, partly because financial markets are looking at betting markets, then there is a strong incentive to use betting markets to send false signals and give competitors an inaccurate picture. I have no idea if this happened, and nobody even hinted to me that it had, but it is worth asking: given the huge rewards to be made and the relatively trivial amounts of money needed to distort betting markets, why would intelligent well-resourced agents *not* do this, and therefore how much confidence should we have in betting markets as accurate signals about political events with big effects on financial markets? Thought experiment: if our campaign had had a Blofeld (if only) then Blofeld would have manipulated the betting markets himself in order to fake the media and financial markets away from dramatic moves before the vote and, as a bonus, the Blofeld hedge fund would have made much more money from exploiting the information asymmetry than it cost to manipulate the betting markets.

The votes

Leave won by 52-48 and by 17.4m versus 16.1m votes. There were 46.5m registered voters and turnout was 72%. Leave won by 53.3%-46.7% in England and by 52.5%-47.5% in Wales. Leave won

nine regions and lost three regions: by 62-38 in Scotland, by 56-44 in Northern Ireland, and by 60-40 in London (though NB. Leave won many more votes in London than the new Mayor did in a higher turnout). These three were also the lowest turnout regions. It has been estimated that 401 of 632 constituencies (63%) voted to leave the EU ([Hanretty, 2016](#)). Of the fifty local authorities where the Remain vote was strongest, thirty-nine were in London or Scotland. We excluded London and Scotland from most of our digital marketing.

The money

VL raised and spent about £13.6m between Summer 2015 and closing of VL in July 2016, with nearly £7m of 'controlled' expenditure (the legal limit for the 10 week campaign) plus £6.6m of non-controlled expenditure. Of this £6.6m, £3.3m was incurred during the 10 week official campaign so the overall ratio of controlled (~7) to non-controlled (~3.3) spend during the official 10 weeks was roughly 2:1.

Only £4.55m of the £13.7m was raised before 13 April 2016. The campaign was only fully funded (in the sense that we had in the bank enough to spend the full £7m) in the first half of June. VL raised £710,000 online: £175k between the launch of our website October 2015 and 13 April and another £535k after 13 April. We could have raised much more on the website at the end but shut down the fundraising because it seemed we would not be able to spend the sudden surge of money coming in, money that would have been so valuable if it had come before the limits began. (This turned out to be wrong because the Electoral Commission suddenly allowed us to donate to other campaigns.) It is also the case, infuriatingly, that having struggled to raise money throughout because rich people were so sure we would lose and/or they did not want to antagonise Cameron and Osborne, there was a sudden surge of money towards us in the last few weeks when the polls moved and we could have raised probably at least another million or two and maybe a lot more. This money was never raised and spent. If it had come earlier when we pleaded for it then we could have won by more. Another few million that could have helped Leave was largely wasted by the incompetence of Leave.EU. The IN campaign received many millions more than VL.

Of the £13.5 million we spent:

- 25% on social media advertising.
- 20% on staff (HQ and out on the ground).
- 16% on ~120 million leaflets, direct mail, and the Referendum Address.
- 5% was given to other campaigns (this was suddenly allowed in the last few weeks of the campaign by the Electoral Commission).
- 5% on office infrastructure, rent, rates, insurance.
- 4% on logistics (e.g. transport).
- 3% on events (e.g. the Boris rallies).
- 3% on IT hardware, infrastructure, consultancy.
- 2% on printing posters and artwork (i.e. traditional advertising).
- 2% on filming, TV ads etc.
- 2% on legal and professional costs.
- 2% on signs and posters.
- 2% on ground campaign materials (non-leaflets).
- 1% on merchandise (mugs, t-shirts etc).
- 0.7% on polls and focus groups (almost exactly 100k total over a year). This is much less than a campaign would normally spend. The reason is a) the broad themes were clear and did not need to be tracked constantly, b) we found a new way to do polling that was cheaper and more useful for digital marketing than standard polling, c) we did focus groups ourselves which is much cheaper than hiring a normal company.

NB. some things like staff costs are spread across the whole period Sep-June while others, most importantly social media advertising, were concentrated very heavily in the last few weeks.

These figures are necessarily a simplification of all sorts of complications and nuances but give a useful sense of relative scale. They are also *not* the final official figures submitted to the Electoral Commission - those figures will obviously be the definitive ones.

The staff

There were ~25 VL HQ staff when we launched on Thursday 8 October 2015, 34 at the start of January, 88 on the day the official campaign began (14 April) and 115 on 23 June.

There were another ~40 paid Ground staff (not working at HQ) of whom 90% were hired after 1 January 2016 including regional coordinators (full-time) plus assistants for them (full-time), then later in the campaign sub-regional coordinators (full-time). There were 641 constituency coordinators (part-time volunteers).

The activists

VL recruited 31,000 activists in total (half of which registered after the start of the official campaign) of which 12,000 were repeatedly active on a weekly basis over the final weeks (4k in March, 9k in mid-May). In 2013 Farage said UKIP had only 30,000 *members* (BBC documentary) - NB. 'members' is nothing like the number of people who actually do anything useful - and he said to me in May 2016 that he had 7,000 activists who 'really do anything'. About 40% of VL activists were Conservative and 30% UKIP. Of the 641 constituency coordinators 90% were Tory or UKIP. Only about 1,200 Tory councillors signed up to help - far fewer than voted Leave. 250 Labour councillors signed up to help. This tiny number reflected the wider phenomenon that 'Labour Party people' were very disengaged from the referendum and largely tried to ignore the biggest exercise in UK democratic history.

The leaflets

VL printed and distributed to activists a total of ~123 million leaflets.

This includes ~67 million leaflets December 2015-23 June for hand delivery, the vast majority in the last 3 months. VL sent a mailing to 10 million households just before the official campaign started (April). VL sent a Referendum Address (free post) to all 46 million registered voters. Eleven leaflets were created plus a further five designs (with 31 separate editions depending on postcode from the data models) for the Referendum Address which was sent out to postal voters at the end of May and then to more Remain areas and finally to more Leave areas landing in the last few days (like our social media advertising we tried to get as many as possible to people at the last minute).

VL delivered over 2.5 million personally addressed GOTPV cards to postal voters and delivered ~14 million targeted GOTV cards over the last week (targeted using the data scientists' model and voter intention data collected from canvassing).

Throughout February the campaign was shipping 500k-800k leaflets per week, by the end of March ~1.5m leaflets per week, and by the end of April ~2m per week. In the last three weeks activists were delivering over 2.5 million leaflets per week. (In May Farage said to me that we should print a few million extra GOTV leaflets for his activists to deliver. This was the first time in the entire campaign he switched from total hostility to an offer of help. This was the same meeting in which

he said that he had 7,000 activists who regularly did things and when I said we had 12,000 he clearly thought we were lying and he believed the bullshit fed him by his court. In the very next sentence he returned to his obsession - the big BBC debate and whether I would agree to him being one of the three. I said No and when our ground staff got in touch with his office about coordinating GOTV it was made clear that the offer would not be honoured.)

The two most effective leaflets in focus groups were a) The Facts and b) for some people an aggressive version of The Facts. The former came from an experiment. We heard people say in focus groups repeatedly 'it's all so confusing, who can you trust, if only someone would give us the facts'. Our data science team also found some interesting experiments using unbranded leaflets so we developed a leaflet that was extremely plain, had no logo or branding, and was headlined THE FACTS. It was less argumentative than normal political leaflets. It presented things in a more neutral tone and we applied some lessons from experiments that had good data and methodology to tweak the wording in subtle ways. It proved more effective across all groups than anything else we'd tried. Lots of those nominally on our side who spent the whole campaign attacking us argued this was further evidence we did not know what we're doing - 'these morons haven't even put their name and logo on!' It seemed that Andrew Cooper and Ryan Coetzee researched what we had done and saw how effective it was as we noticed that soon after we started doing this BSE started experimenting with similar ideas. ([Click HERE for a version of The Facts used as a referendum address in some postcodes.](#))

The canvassing and GOTV

VL had targeted GOTV activity in 96% of constituencies and marginal-seat style GOTV operations in half all constituencies.

Activists knocked on about half a million doors (low estimate) before GOTV. On 23 June they knocked on about 1.5 million doors and probably interacted with about half a million people.

Canvassing only really got going at a useful rate late in the campaign after the May elections. We struggled to get volunteers to canvass even though the best evidence (including from randomised control trials) is that it is by far the most effective GOTV tool - much more effective than street stalls and more leaflets etc. As a party UKIP does not do canvassing and many UKIP activists were hostile to it and just refused.

Most MPs were not interested in helping on the ground at all. Some did something in the last 8 weeks and there were some stars (e.g. Anne Marie Trevelyan, Steve Baker, Carswell). Dan Hannan opposed various aspects of how we ran the campaign but he did make a big effort on the ground. Some VL Board / Campaign Committee MPs generated *no data* in their constituency despite spending the preceding year demanding 'more action' and more control (i.e. control of message and to be on TV). For example, Bernard Jenkin spent much of the year leaking and briefing against the campaign and saying 'you must listen to Bill Cash and put him on the Today programme and we must have more control over the message': by the time of the last Campaign Committee meeting just before the vote he had produced almost no data for his constituency and had no idea or interest in what volunteers on the ground were doing there. I'll dig out the league table and publish it. There was a strong correlation of 'asshole : lack of effort' as you would expect. Many assumed that people who had been boring on about the EU for decades and had campaigned for a referendum must surely be keen to play a part on the ground. Wrong. TV derangement syndrome is mighty powerful.

If Leave MPs had collectively made a serious effort after Christmas 2015 they could have added significantly to the campaign. By the end of May activists were collecting and entering around

25,000 voting intentions per week, which later increased in the first two weeks of June to around 35,000 VIs per week. This is a rate of ~140,000 per month so if we could have done that from January we could have got ~10⁶ canvassed VIs to add to those from direct mail and the data science models (the latter of which provided most of the doors to be knocked for GOTV). (Actually the number would have been greater than this because we would have gained from network effects compounded over time as early help rippled across the network.) Data from canvassing helped improve the accuracy of the data science models which in turn helped improve the efficiency of canvassing and all of it helped target social media too. These models had inputs from many sources: for a summary of this process and how we developed the first web-based canvassing software that works in the UK see [HERE](#).

It is important to realise that most of the numbers from the ground are very rough estimates. Knowing what orders are given is not the same as knowing what orders are followed. Our approach was by intent and necessity Mao's - *strategic centralisation, tactical decentralisation*. We were extremely firm about the core message but we gave people on the ground a lot of freedom to do what they thought best and we encouraged them to *network horizontally* without reference to HQ. There is inevitably a lot of fog. Also many contributions are on a severe power law (not a normal distribution) - i.e. a small number of people massively outperform the majority while a large number do little or nothing so average figures are misleading (e.g. a small fraction of the ~30k volunteers did more than half the work).

There are methods to improve the accuracy of feedback from the ground that are deployed by other campaigns around the world that we did not have time to implement. There are technological improvements that could greatly improve the accuracy of ground campaigns. For example if we were doing this again we would use our App to turn each activist's smartphone into an active sensor that automatically sends data to HQ allowing automated measurement and analysis of their activities (did they go where they were supposed to etc). (One also has to guard against creating metrics that distort activity, a hazard that grows with the growth of data-driven methods.)

Events

It is hard to define the 'number of events' usefully. E.g. On 12 March - Take Control Day (TCD) we held events in over 400 constituencies and held ~500 campaigning events across that weekend. The importance was very variable. Some involved a handful of people, some hundreds of people and were on TV.

By May/June we were averaging more than 2 campaign sessions per week per constituency, so over ~1,300 per week. In the final 10 days we were doing at least an average of one campaign session every two days per constituency, so over the last 10 days ~650 x 5 ≈ 3,200.

Constituency coordinators were empowered to organise things themselves. It is therefore impossible to put precise figures on the number of events organised this way without HQ's direction, control, or knowledge but we do know the rough scale.

The 'political scientist' Matt Goodwin made claims about VL's ground campaign during the campaign that floated between ignorant and dishonest. On 1 June he published one of the most incompetent pieces on data and the referendum [HERE](#). In one sense this was useful as it gave our opponents false information. We therefore usually ignored such things. But this came at a difficult time for us when almost all the strongest Leave MPs were in a particularly panicky mood and being fed lies

from Farage about the ground campaign. We had to explain to them why it was wrong so we also explained to hacks and Goodwin himself.

Goodwin claimed that we had organised less than 1,400 'events' since the start of the campaign. We pointed out to Goodwin that his figures were wrong - there had been 500 on just one day (TCD) in March - and rested entirely on what we made public on our website (which he misread) but >80% of our activity, including almost all canvassing sessions, was *not made public on the website*. His response was to say that he would continue to make his bogus claims unless we turned over our internal data to him during the campaign, something we obviously could not do and a sign of his character: implicitly - either help my career or I'll say things you don't like. After 23 June various people, including other academics, have told us that they told Goodwin that they knew he was wrong because - surprise surprise - they had signed up to our website as volunteers and therefore knew all sorts of events were happening that were not public. His response? He ignored it. (He also fundamentally misunderstands the logic of ground campaigning but that is for another day.)

Goodwin is a dishonest charlatan and not unusual in the world of social science which also has huge problems with a lack of skills. Almost nobody in this world is trained in hard quantitative skills to a high level and this leads to endless problems with data and statistics. The explosive growth of serious data science also means an explosive growth in data charlatans trying to cash in. Those who fund Goodwin should make clear to him that unless he changes his methods his funding will be stopped. If social science wants to be taken seriously then it should demonstrate the sort of accountability that is bog standard in the physical sciences. The media should not take his claims seriously and the hedge funds he is trying to hook should kick him into touch. If Cambridge University are really going to get him to write a book on the campaign a) it shows the lousy standards in the field of political science and b) they will need to get someone qualified to check all his data. Goodwin's funders should read Feynman's classic Commencement Address on 'cargo cult science': he, like many education researchers, is firmly in the cargo cult tradition.

The debates

Few things caused me more trouble than the debates organised by the three broadcasters. The reason is simple: it hyped the virulent SWI 'TV derangement syndrome' to even greater levels than normal. Everybody wanted to be the star of the big BBC debate on 21 June. The feeling was so powerful it drove some people potty (a few joined the January coup because they thought I would not put them up for this event). Many characters actively did not want Boris to join the campaign because they knew it reduced their chances of being the star. Of course, they did not reason like this to me or, probably, to themselves. Instead, they argued that 'Boris is only in it for himself, the audience will smell his lack of authenticity'; 'we need the best debaters Dominic, not the biggest stars'; 'we need someone up there who has really lived with the issues for decades Dominic', and so on. Some on our Board, including Bernard Jenkin, said that Boris joining the campaign would be 'a disaster' and were cross with me for trying to persuade him. Three exceptions were Boris, Gove, and Gisela. None of them wanted to touch the debates and Boris, unlike those many jealous souls who assumed he, like they, would want to do it said 'I'm rubbish at these things and I hate them get someone else.' They only agreed to do them after I put them under extreme pressure, moral blackmail etc.

Negotiations had started in autumn 2015. There was an alignment of interests between the Remain-supporting broadcast executives (i.e most of them) and Downing Street: both wanted Farage to be the star of the show. Downing Street made clear to the broadcasters, who made clear to us, that Cameron would cooperate on the basis of Farage but would do everything to stop Cameron appearing with other senior Tories. (This was a general issue for news during the campaign as Downing Street tried and often succeeded in not only choosing their own

representative but also ours.) This was one of our core problems: Farage was popular with a small section of the country and very popular with a smaller section but he was overall a clear net negative particularly among the middle classes. (The reasons were partly fair and partly unfair and I discussed them before, CTRL+F Oblonsky.) The debate drove him mad and dominated every interaction with UKIP from summer 2015 to the end.

ITV made many promises about how they would arrange their debate on 7 June. It turned out that they just lied and negotiated a separate deal with No10 and Farage as we suspected they might but which they promised not to do, and they proved interestingly unembarrassed at their dishonesty regarding it as 'all fair'. (Part of the reason was that ITV Board members were strongly pro-Remain and influenced the news in various ways, as some executives there told us and some journalists admit.) The evening this happened we got word that some very senior people in the BBC wanted to ditch 9 months of discussions and copy ITV. They were due to meet the next morning. This is why we issued a threatening statement that night ('consequences' for ITV etc). Although ostensibly aimed at ITV it was actually aimed at the BBC management gathering the next morning. I wanted them to think: 'my God if we do the same we'll be sucked straight into an appalling public knife fight with Vote Leave, bad for the BBC, bad for my career, let's stick to the deal'. (Of course this kicked off another round of infighting as we could not explain to the usual suspects what was happening because they leaked everything.)

My feeling was that the overall effect of the debates was net good for us despite Farage doing ITV. We finally got the MPs singing the same script as the leaflets and marketing - 'let's take back control' echoed around the studios. The flaws in Cameron's argument poked through his performances. Millions saw he had no serious answer on immigration in general and his answers on Turkey looked dishonest and evasive. By then he and Osborne had gone full Spinal Tap and cranked up their warnings to 'volume 11' every day. Our focus groups showed that this was now undermining their own core message and people were starting to laugh - 'now he's saying it'll be World War 3, what a joke, I don't buy it, I'm going for Leave' etc. By the time of the big 3v3 on the 21st, the IN side had lost the plot (partly over the murder) and wasted a lot of time babbling about 'lies' and tweeting multicoloured broken hearts at each other in a classic example of the better-educated succumbing to hysteria while the worse-educated largely ignored the hysteria. Attacking Boris the way they did was a mistake and could only have worked if he had blown up, but we attacked him much harder than they did in the practices so by the time the real thing happened he dealt with it coolly ('Train hard, fight easy').

7 June	ITV Cameron v Farage:	4.2m
9 June	ITV 3 versus 3:	3.2m
15 June	BBC Question Time, Gove	3.7m
19 June	BBC Question Time, DC	3.85m
21 June	BBC Wembley 3 v 3	4m

The digital communication

Almost no stories were written about this during the campaign. a) Few journalists are trained to do data. b) Almost all journalists who do data stories are at best trained as social scientists and therefore very rarely have advanced quantitative skills and approximately none are trained in subjects like machine learning/AI which can now be applied to electoral, advertising, demographic and other data. c) Social media activity is intrinsically hard to track and requires resources even if

you know what to look for and you do have advanced skills. (I do not have even basic skills.) d) We ran very few digital ads in London (you can positively/negatively target audiences geographically) which contributed to people in London not seeing what we did.

Amounts are in dollars because they went through the system of the excellent Canadian firm AIQ, our digital agency that worked with our data science team and Henry de Zoete. NB. the caveats at the top.

Some but not all of the numbers below include the football competition we ran - a prize of £50 million if you could predict the results of the European Football Championships. We wanted to make it a £350m prize and I still sometimes punch the steering wheel that we couldn't persuade an insurer to do it - just imagine if we could have announced a £350 million prize. This provided very useful data including from people who usually ignore politics, helping us refine various models, and it also provided us with mobile numbers for GOTV. Some connected to VL, such as Bernard Jenkin MP, have briefed false stories about this project. I know they are false because we never told the Board or any MP what data we collected in this exercise (and I still haven't) - we only told Boris, Gove, and Gisela (among MPs) and a few others we knew would not leak, including Alan Halsall and Peter Cruddas, about the project's existence just before it launched. Some usual suspects went ballistic when the story broke and tried to stir up the Board but it was too late and we ploughed on. If they'd known that we'd tested it by running it live on Asian porn sites in the middle of the night before it went live in the UK they'd have screamed louder.

Many metrics show a growth of about an order of magnitude and more between the start and end of the 10 week campaign. This should be a warning to people who talk about 'the power of a campaign' to change people's minds. Most people ignore almost everything until the last few weeks before an election. People paid little attention to the renegotiation and did not really start tuning in until the last 3 months and many millions only tuned in over the last 3 weeks. Much of the spread of messages therefore comes mainly because attention is 'artificially' switched on, not because the messages are particularly brilliant or interesting (usually in politics they are not). Even given this artificial spurt of attention you can see that the vast majority pay much more close attention to football and the entertainment industry than to politics even a month before 'the most important vote in 40 years'. This lack of attention means that to communicate anything to millions of people you need a) extreme focus and simplification and b) to think extremely hard about what people really i) care about and ii) know about and are likely to be able to understand. *Campaigns can ride waves but they rarely make them.* Our success did not come from creating a wave but from riding powerful waves as I have explained.

Emails. VL collected ~350k emails, substantially fewer than BSE. I.e. only about 1:100 of the electorate were motivated enough to sign up to get information from the official Leave campaign. NB. Randomised trials show that email has practically no effect on GOTV. Face-to-face is best, texts are much better than emails and phone calls, and there is some (not high quality I think) evidence that personal Facebook messages are between face-to-face and texts.

Texts. VL sent over half a million text messages on 22-23 June. Total cost = £9,000 +VAT so ~2p per text. We should probably have sent more.

Twitter. VL had just 67k Twitter followers by 23/6. Tweets with hashtags get more attention, asking for retweets works, adding pictures or videos really works. The most engaging tweet got 5k likes and retweets, very very short of the scale one regularly sees in the entertainment industry. Twitter was not a very important medium for spreading our message outside a small number of very motivated/interested people. There is no good data on its effectiveness so we spent almost no money on it. Generally it seemed to me that Twitter increased the isolation of politicians and the

media to real opinion in the country and increased false confidence among insiders about 'public opinion' but I've got no numbers to support this.

VL spent ~\$3.6m on digital communication (Facebook, display, search, and video plus some small miscellaneous) in the 10 week official campaign. It was strongly backloaded with spending low in the first few weeks as experiments were tried then ramped up strongly in the last two weeks and especially the last five days (known internally as 'Waterloo'): <\$50k daily before mid-May, \$50k-100k daily from mid-May to 19 June. Over the last 5 days we spent roughly 160k, 170k, 230k, 300k, and 230k, i.e. just over a million dollars.

This was divided into: \$1.7m Facebook (146 million paid impressions), \$660,000 display (91 million paid impressions), \$607,000 video (40 million paid impressions), \$487,000 search (8 million paid impressions), \$123,000 miscellaneous. There are obviously *network effects* as the spending also sparked unpaid organic views: 100 paid impressions generated about 75 organic impressions.

Overall paid ad impressions: VL served **309 million online ads** in the 10 week campaign. These 309 million ads generated ~255K individual online 'form submits' (i.e people landing on a page on our website and inputting their data). This equates to just over **one cent per impression** or ~85 impressions per dollar.

On Facebook an 'impression' means the number of times X on your page is displayed: someone may notice it and may pay attention but they may also not even notice it. 'Reach' means the number of people who see X, so the number of impressions will be greater than the number of 'reach' when people see the same thing via different routes. Impressions can be 'paid' (i.e you paid to have it displayed), 'organic' (non-paid), 'viral' (content is displayed because it has been shared etc).

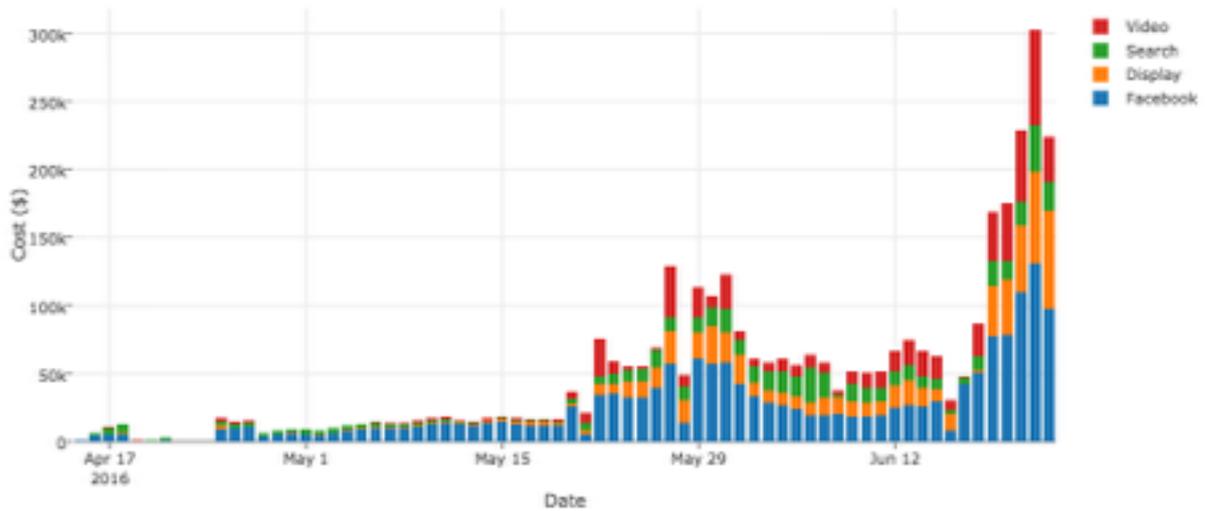
The \$607,000 on videos (all 2 mins max, often 15-30 secs) generated about 40 million impressions (74 impressions per dollar), 10 million 50% views (~17 per dollar, or ~6 cents per 50% view), and 7 million 100% views (12 per dollar, or about **9 cents per full view**). There were also about 25 million views of more than 10 seconds of video on Facebook in the last 10 weeks of the campaign with 0.5m-1.5m per day in the last three weeks. (These numbers don't include all the organic views of videos on YouTube, our website etc.)

The vast majority of all these short videos, as with the ads generally, hammered the same messages: 350m / NHS / Turkey. Most of the money was spent on *persuading a group of about 9 million people defined as: between 35-55, outside London and Scotland, excluding UKIP supporters and associated characteristics, and some other criteria*. The rest went mostly on targeted GOTV. The most successful ad with almost all demographics all the way through was a variation on £350m/NHS that AIQ did early on and we never could beat it.

VL spent very little (~300k) on traditional physical advertising. We spent some money to hack the media's reporting of 'photo-ops'. We spent some on bus stops and some experimental stuff (like 'clean graffiti' outside budget supermarkets etc) in low income areas that models said were good for us. There were only two messages in these ads: 1) £350 million/NHS, 2) Turkey/NHS.

Graph: digital spend per channel, 10 week official campaign, heavily weighted to last few days

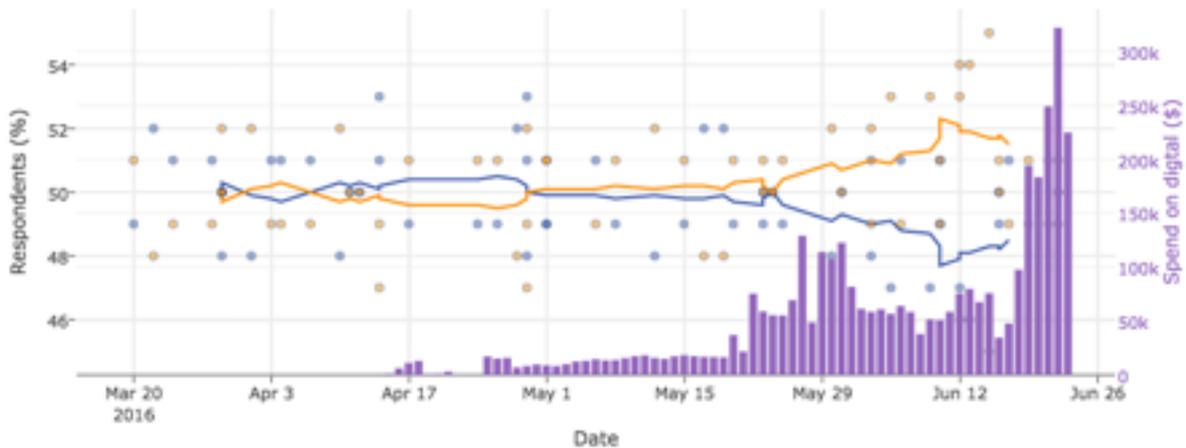
Spend by channel



Total spend = \$3,570,163

Graph: distribution of \$3.6m digital advertising spend & average of online polls (orange = leave)

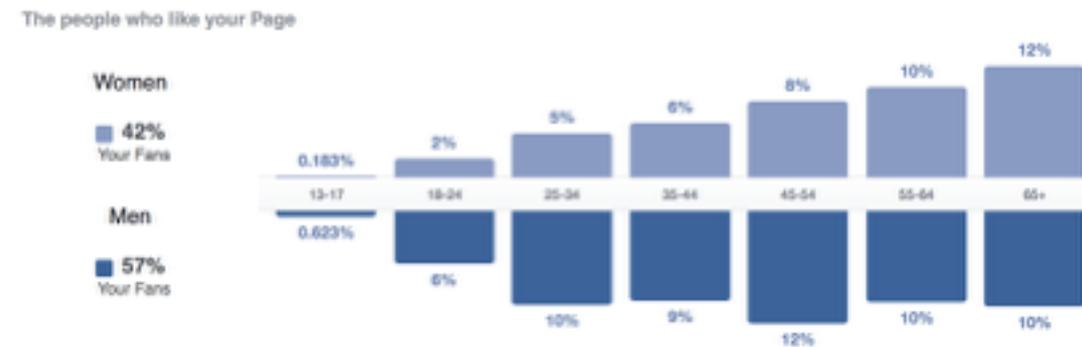
Online polling on EU referendum



Facebook.VL had ~550k Facebook followers. NB. 'Followers' is not a useful metric to gauge success on Facebook. The reason is that Facebook changed their algorithms so that Newsfeeds are optimised to show you what people are paying to show you, not what Followers post. This means that those

who spent millions buying Facebook follower armies a few years ago had the value destroyed. Arron Banks didn't realise this. Neither did most hacks. Banks spent hundreds of thousands buying followers that had almost no value. He then used this largely phantom army of core Leave voters to claim he had a highly effective digital marketing campaign. Many hacks believed his bullshit. Unfortunately so did many MPs who could not be persuaded of the truth. He is still peddling the same bullshit and some hacks still buy it. *VL's money was spent on paid advertising to target audiences, not buying Followers.*

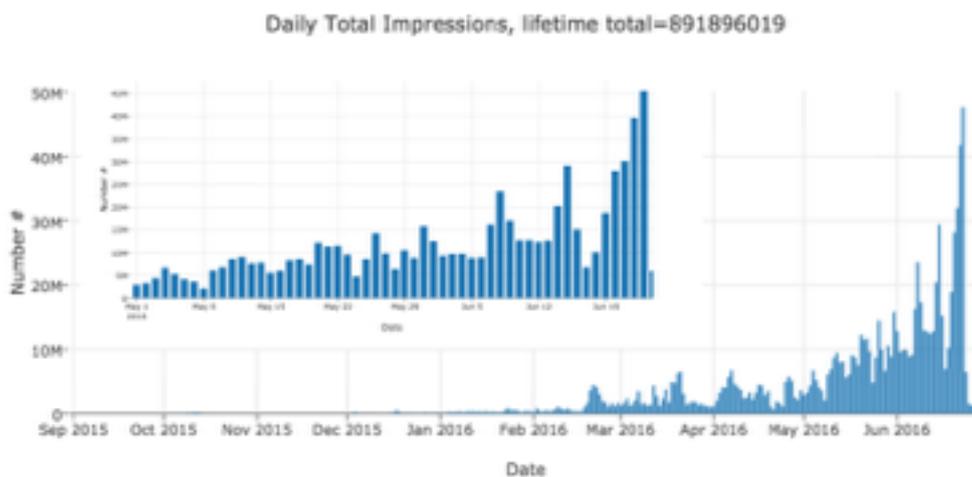
Graph: Profile of Facebook supporters - 62% >45 years old and another 15% 35-44. Only 23% <35.



Total Facebook impressions from October 2015 were ~890 million but this was very back-loaded with about half in the last 4 weeks. It never reached 10m daily until the second half of May. From 1 May - 6 June the daily number was ~5-10 million. From 7-19 June it was ~15 million daily. Over the last days it was ~25m, ~30m, ~40m, ~45m daily. (NB. something odd happened on the last day, spending reduced but impressions rose by many millions so our cost per impression fell to a third of the cost on 22/6 which is not what one would expect and we never bothered going back to Facebook to ask what happened.)

Graph: ~0.9 billion total Facebook 'impressions' from VL's launch in October 2015

Facebook ads + posts



Facebook 'reach' (no. of people seeing content) was generally <2m daily until April, growing from ~2m daily to ~5m daily during May, and 8m-12m daily in last few days.

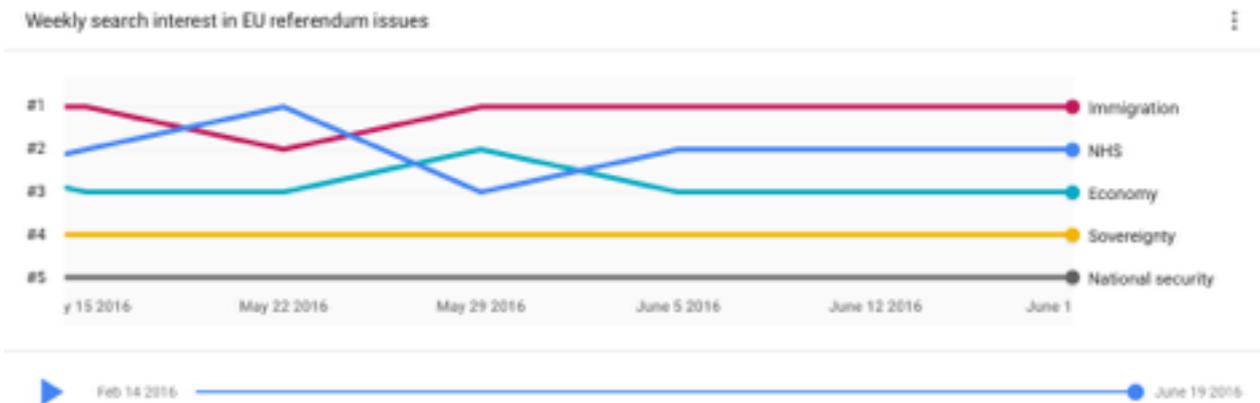
Graph: daily Facebook 'reach', last 10 weeks



There were 26 million 10+ second views of videos on Facebook during official campaign



Graph: change in top Google search terms, immigration and NHS at top. Many did not understand why we put the NHS at the heart of our message.



Conclusion

We squeezed every part of our £7m 'controlled' budget to enable us to focus as much as possible on digital marketing. We focused most of this money on the last 10 days and on about 9 million 'persuadables' - *not* our core voters - identified by the data science team from a variety of sources with a variety of methods some very simple and some very sophisticated. That group was on the receiving end of a barrage of £350m/NHS/Turkey mostly in a small time window. Contrary to some assumptions, we did *not* do 'microtargeting' by message - i.e. breaking everybody down into small groups and delivering many different messages. We did break the electorate down into small groups for analysis by using new tools not on the market but we discovered that essentially *all relevant demographics responded best to £350m/NHS*. So, while we did what you might call 'micro-analysis' we did not do 'micro-messaging', at least not in the conventional use of the term. (Also much of what you read about 'microtargeting' is not based on good research and lots of the recent coverage of Trump's use of psychological data such as Big Five personality tests, which we also examined carefully, exaggerates its effectiveness.)

A modern campaign involves large amounts of data from many different sources. The key is to integrate it effectively in ways that provide *actionable intelligence* and to integrate all the different efforts (social media, ground, media, debates etc) so they are coherent. This requires project management skills and a *systems perspective* - that is, integrating information such that there is a common picture of the complex system and the plan that is shared across a multidisciplinary team which can adapt very fast to a rapidly changing environment: an OODA loop (observe-orient-decide-act) that is well-oriented to reality and updates as fast as possible.

Many of the lessons from this sort of complex management project could be applied to commercial management and marketing and could also greatly improve the performance of government. Contra many free market / libertarian think tankers and businessmen, the defining difference between the private and public sectors is *not* the competence of people and most big companies are entangled in the same sorts of destructive bureaucracy as Whitehall, as Warren Buffett often points out. In a separate series of blogs I will explore these broader management issues - the first one is [HERE](#). In this series I will next look at Shipman's book which deserves all the praise it has got.

Dominic Cummings
Campaign Director of Vote Leave
January 2017