Re Technical Details Draft

Robert Tupelo-Schneck <schneck@gmail.com>
to: Lee Naish <lee@csse.unimelb.edu.au>, Robert Loring <votingsite@gmail.com>
date: Fri, Feb 11, **2011** at 10:53 PM
subject: Movable Money Votes

Dr Naish, Rob Loring alerted me to a message of yours on openstv@googlegroups.com, expressing interest in adapting STV to the funding of public goods. I have worked with Rob on the design and implementation of such a system. I have often wanted to take the time to write a paper about it, but real life has so far intervened.

However, I can probably very quickly motivate our system for someone who has already thought about STV from a technical viewpoint. Consider an STV election with 1000 voters for 10 seats, using the Hare quota. Each candidate needs 100 votes to be elected. This is an exact analogy for a funding "election" where 1000 voters wish to distribute $1000 among candidate projects, with each project costing $100. We divide up the $1000 evenly so that each voter has $1 to spend, and use STV to determine which projects get (parts of) each $1, considering a project funded when it reaches $100.

Now, consider a funding election where some projects cost $100, some cost $50, and some cost $200. I claim the same STV methodology (any of them, take your pick; we like Meek) still applies, just letting the quota variy from candidate to candidate. Importantly, and

interestingly, this generalization seems to require the Hare quota. (The Hare quota fits nicely with the intuition of a democratic funding election: it would be surprising to fund a $100 project with only $91 a la Droop. In any case, once there are differing funding levels, I can't see any useful way to apply the Droop quota.)

A further generalization is to consider projects which can be funded within a range, e.g. a project that could use anywhere between $50 and $200. We can let voters specify not only that they wish to fund the project, but at what level they want it to be funded. (Voters can even do splits like "My first preference is to have Bread funded at $50, my second preference is to have Circuses funded at $150, and my third preference is to give Bread another $50 for a total of $100.")

One final point: our real-world motivating example has about 100 people using about $10000 to fund projects ranging from the tens of dollars to the thousands. In particular, without some modification, a single voter's share would be enough to fund some whole projects. So we introduce what we are calling a "support obligation" [or the "base number"], which requires a certain threshold of voters (1/3 or 1/4 of the voters, say) to put some money toward a project before it can get funded; that's essentially just limiting what fraction of a candidate project's amount a single voter can supply. In this setting, it's not uncommon for a voter's "first preference" to actually end up spreading over several candidate projects, which is interesting but doesn't interfere with

STV functioning.

Rob can remind me if there are any highlights that I've missed.

I'd certainly be pleased to talk with you about this more!

Best, Robert

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from: Robert Loring <votingsite@gmail.com>
to: Robert Tupelo-Schneck <schneck@gmail.com>
date: Thu, Feb 17, 2011 at 11:19 PM
subject: Re: [openstv-dev] Future of Debian package
mailed-by: gmail.com

About your letter to Lee Naish, I was going to send you the paragraphs below tomorrow, end of the week you know. And I was going to give you my encouragement to form it into an article or an initial letter to Voting Matters.

I might add some emphasis on two things:

1) The "Support Obligation" neatly combines two requirements: a) enough money to fund a project at the level set by its supporters, and b) the minimum number of votes. The latter should be agreed to before voting. It acts the same as the quota of votes or "threshold of victory" required in an election. (If an item has a fixed cost, then we may speak of that as a quota of money. But there is no quota of money when voters may set the cost wherever they collectively choose.) We combine these two requirements into one number -- as we must to

guide the process of elimination.

The maximum a voter may give to help fund a project at level $X is $X divided by the required number of votes . If a project-funding-level gets more than that quota of votes, then each vote's share of that funding level goes down.

2) Robert's algorithm lets each voter set their own funding level(s) and removes most of their incentives for strategic voting, such as trying to move an average up. I think his algorithm is suitable for voting to adjust ongoing budgets of departments; those are the big budgets in the organizations I know. Robert is less enthusiastic about using it for that purpose.

"Participatory Budgeting" is still rare in English-speaking countries, but it is growing even there. The final decisive votes have been tallied by Bloc Vote or Borda's rule.

My Accurate Democracy website has more about Fair-share Spending. It includes a few more innovations such as suspending weak items rather than eliminating them.

Love and best wishes to you and your family,

Rob

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from: Robert Tupelo-Schneck <schneck@gmail.com>
to: Mark Latham <mark@votermedia.org>
cc: Robert Loring <votingsite@gmail.com>

date: Sat, Mar 24, 2012 at 10:33 PM
subject: Fair-Share Spending and VoterMedia

Hello Mark! Rob and I will both be at the PB conference. I've looked over your website, and I look forward to reading your papers and meeting you in person.

I regret not having a paper ready-to-hand to send to you. We have a technical paper in progress for submission to Voting Matters (http://www.votingmatters.org.uk/), but that's been on hold while we prepare a more popular presentation for this conference; and for both of us, this is not currently our livelihood.

Meanwhile, I think I can give you a quick, but mostly complete, picture of how it might work; say, in the context of VoterMedia. I hope you'll see that there are answers to two concerns you raised in your email (about empowering minorities versus funding central projects with broad appeal; and about fixed budgets vs. variable amounts).

I haven't thought about ongoing vote collection, so I'll leave that aside. But suppose there's a pool of $8000 to be distributed to the blogs, and you have 1600 voters. That means each voter has a $5 share. And each voter's ballot will decide where that $5 goes.

That works by preferential or ranked-choice voting: each voter ranks the blogs, from first (most preferred) to last. And, assigns to each a funding level, say one of $500/$1000/$1500/$2000.

Each voter gives their share to their first preference; but if their first preference ends up losing, their share transfers to their second preference. And so on. And, if a blog has so many voters it takes less than a full share to fund it, each voter only has to spend part on that blog, with part going on to lower preferences. (Being in BC, you may recognize this as a form of STV.)

Now, it takes 100 $5 shares to get a blog to $500. As you suggested in your email, it may not be beneficial to allow a small minority to control so much money. Our system accounts for this as follows. In addition to having to actually get the money needed to be funded, a blog also needs a certain percentage of the voters. This is a parameter of the system, which can be tuned to the needs of any particular election. Maybe you'd say 30% of the voters could be entrusted to spend 30% of the money, but no smaller minority. Let's round that to 500 out of 1600 voters---that is, it takes at least 500 voters to fund any blog. This essentially means a voter won't give all $5 to a single blog; at most $1 (for every $500 the blog might receive). The remainder of the $5 share transfers to lower preferences.

(It's true that our own inclinations might lead us to wanting smaller minorities to be able to spend their share, but in any case there's a need for some requirement of sufficiently broad support. The system should work just fine with that requirement set to 30% or 40% or even potentially higher.)

A quick word about disparate funding levels, by way of

example. Suppose 300 voters want Blog A to get $500, 300 more voters want Blog A to get $1000, and 200 more want Blog A to get $1500. We count that as 800 votes for Blog-A-at-$500, 500 votes for raise-Blog-A-from-$500-to-$1000, and 200 votes for raise-Blog-A-from-$1000-to-$1500 . Now, unless other votes transfer to A-at-$1500, Blog A is only going to get $1000... 200 voters isn't enough to spend $500, you need 500 voters for that. So, each of the 800 spend $0.625 to get Blog A to $500, and each of the 500 spend an extra $1 to get Blog A on to $1000; in other words, 300 spend $0.625 each and 500 spend $1.625 each.

We think the fair-share concept is exciting and will be exciting to voters. Each voter is really controlling a share of the money... not just in the abstract, but in a very tangible way. Their ballot actually determines where $5 of the budget is going! In an online setting, you might even allow voters to log back in afterward and see how their ballot's share was spent: "Your share of the budget was $5! Your first preference did not win, but $1.60 of your share went to your second preference, $0.60 to your third, ..."

I'd welcome any questions you have, and look forward to future discussion.

Robert