BitGadaa: Futuristic African Democracy

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1. Introduction

The Oromo aphorism *Kan darbe yaadatani, isa gara fuula itti yaaddu* (By remembering the past, the future is remembered) – "the most philosophically interesting statement in Ethiopian culture", according to M. Mennasemay, "incubates a non-linear conception of history, a future-oriented understanding of tradition, and a conception of emancipation that embraces political and economic democracy, social justice and cultural flourishing."

Gadaa, an indigenous African democratic system, which A. Jalata calls "the totality of Oromo civilization", is a manifestation of the philosophy behind this aphorism. Based on an ancient calendar, and with a myth going back to the Kushite-Kemetic days by the riverbanks of the Nile, Gadaa is an egalitarian social class system based on time (and reputation). It is a rather complex structure that compelled Donald Levine to refer to it as "one of the most complex systems of social organization ever devised by the human imagination". Asmarom Legesse, a renowned Gadaa expert, commented "[Gadaa is] one of the most instructive turns the evolution of human society has taken".

If Gadaa is as complex and as instructive as has been suggested by scholars, then it can be argued that it must have innovative ideas worth learning from. We shall indeed be inspired by Gadaa as we forge a better future. The inspiration is drawn from both its *structure* (the past) and its universal *principles* (which transcend the past-future dichotomy).

In a postscript titled "An Essay on Protest Anthropology" to his 1973 book "Gadaa: Three Approaches to the Study of African Society" based on his Harvard PhD dissertation, Asmarom Legesse writes the following.

> We study African cultures so that they may live and grow to become the enduring foundation of a distinctive African civilization. In that process of growth, every culture has something vital to offer. Man's wider cultural identities must be allowed to grow, not by the predatory expansion of one civilization, but by the complementary integration of many diverse cultures. No human community, however humble, should be forced to give up its cultural identity without making a critical contribution to the larger reality of which it becomes a part. That remains true whether the larger reality is national culture, pan-African culture, or universal culture.

In light of the Oromo aphorism as well as the structural innovations and universal principles of Gadaa, a futuristic system known as *BitGadaa* is proposed. The

"bit" prefix hints at the digital age that we are living in (a bit is the basic unit of information and computation).

The rest of the article is organized as follows. In section 2, we motivate the endeavor. In section 3, we introduce Gadaa and section 4 presents BitGadaa. Finally, we discuss and conclude the article.

2. Motivation

2.1. Gadaa in the Spotlight

To say that there was at least one democratic system in Africa centuries before the West may sound heretical. "In much of what is written about Africa, the common image is that of people governed by primitive customs and practices, in which only the feudal roles by elders, kings, chiefs, sultans, and emirs have been acknowledged by Western observers." (See Asmarom Legesse, "Oromo Democracy: An Indigenous African Political System", 2006.)

An endeavor such as BitGadaa would serve the purpose of introducing Gadaa (and similar systems) to the wider public. To do away with the civilized-savage distinction that has plagued much of anthropological thinking (and history), initiatives that integrate multiple cultures toward a universal culture could play a key role.

What is particularly interesting about Gadaa is its inherently computational nature which makes it quite amenable to structural and functional analysis. What Sir Edmund Leach said about social systems and computation is worth quoting here.

> Human society was made by man, so man should be able to understand society, in an engineering sense, e.g. why it holds together and does not collapse. Behind this there is the further perception that all the artifacts (including human society) which man thus "makes" must necessarily be projective transformations of what the human brain already "knows." This implies, to use computer terminology, that social products are generated by "software programs," operating through but limited by the computer-like machinery of the human brain. The "software" comes from our cultural environment; the "hardware" derives from our genetic inheritance.

As we will see next the study of Gadaa has been approached from a computational and simulation perspective.

2.2. Gadaa, Computers, Eureka

There was a eureka moment for Asmarom Legesse sometime in the late sixties. With the coaching of Harrison C. White, he succeeded in empirically validating the structural model of Gadaa he came up with. He simulated the evolution of

the Gadaa social system over 400 years using a generative model and data from Mexico and the Boran Oromo (who still practice Gadaa alongside the central Ethiopian government). He described his success saying:

> Perhaps for the first time in the history of anthropology the evolution of a social system has been replicated experimentally [on a high-speed computer].

It is worth noting that the experiment was about *analysis*. Anthropologists like Edmund Leach (with his mathematics and engineering background) and Claude Lévi-Strauss (whom Asmarom Legesse cites extensively) have early on understood the power of "thinking with computers" so as to keep the methodological promises of structuralism.

The question, then, is if can we use a similar computational thinking approach to come up with a modern *synthesis* of Gadaa (say, as the *BitGadaa* system). Judging by how important the system has been for the Oromo and the nostalgia around the word "Gadaa" as a cultural symbol, a modern synthesis should be interesting.

2.3. Gadaa: a Modern Synthesis?

Little has been done to reconstruct Gadaa. Currently it is a little-known peripheral institution considered archaic by many. The way it functioned and distributed power among the people is very different from the Nation State paradigm which has superceded it.

Two efforts are worth mentioning with respect to a modern synthesis of Gadaa. The first is a thesis by Z. Sirna ("Ethiopia: When the Gadaa System Rules in a Federal State", 2012.) which explored the possibility of distributed governance using Gadaa from a legal and indigenous studies perspective. The second is a political organization known as "Gadaa System Advancement Party". Other efforts borrow names from the Gadaa tradition but they rarely retain the structure and the principles of the system.

It is against this backdrop and with the conversation around a technology-based "Network Society" that we propose BitGadaa as a digital synthesis of Gadaa. Before we introduce BitGadaa, however, let us take a closer look at the Gadaa System.

3. The Gadaa System

3.1. Principles vs. Structure

Taking the complexity of Gadaa into account, it is perhaps wise to focus on its essence. Its *principles* like the rule of law, merit-based roles, egalitarianism, balanced opposition, distribution of power across groups and generations, check and balance, adaptiveness, etc. will remain part of what we take as being the

essence of Gadaa. What the British diplomat Walter Plowden said ("of all republican systems, Gadaa is superior") hints at the primacy of democratic ideals in the system.

The social *structure* can be simplified as has been suggested by scholars like Asmarom Legesse should a modern synthesis (say BitGadaa) is desired. Furthermore, two shortcomings of the system need to be addressed. One is the exclusion of females from political affairs. The other is the problem of scaling the Gadaa consensus procedure to millions of people instead of thousands. The former, the issue of females, can be addressed by agreeing that social roles will be gender-agnostic. This is something that has happened in many democracies (also a change that has already happened in Oromo society in the past decades). The latter, scalable democratic consensus, could be solved using technology, as we will see later.

3.2. Structural Essence

Gadaa can be seen as a protocol that operates in a peer-to-peer manner over a social network. Individuals join the network ("birth") and leave ("death"). Depending on how much time the individual has spent in the network ("age"), he will be a member of an age group. (Hence the temporal classification of Gadaa.) There are a number of named levels (~10), each with a time period of 8 years. Except the first few levels, each age group has its own assembly. Individuals build reputation over time and are elected for specific roles. Every individual is in one of 5 parties, which assume leadership roles in a round-robin fashion. As such, there is a spatial classification of individuals in the social network. Each of these parties (known as the "Shanan Gadaa") has a traditional attribute. (These can be mapped to a modern two-axis political spectrum, i.e. economic: left/right and social: authoritarian/libertarian, plus a neutral position. See PoliticalCompass.org for an example.) People convene at the "assembly of the multitudes" known as the *Gumii* (or *Caffee*), out in the open where everyone can voice their opinion. This ritual involves intense debate, legislation, impeachment, etc. showing how democratic and adaptive the system is.

At its core, Gadaa is all about social *consensus* and a collaborative economy. At a meta-level, it's a *reputation-based peer-to-peer governance protocol with spatio-temporal classification*. Deep down it resembles a classless society, the ultimate condition of social organization in Marxism.

The aforementioned protocol might appear fairly reductionist for a system as complex as Gadaa. (For example, when Araro Ramata, an Oromo historian, discussed father-son class naming scheme in Gadaa, he noted that consecutive appearances of particular class names occurred in alternate son-to-father lines. A modern proof of this result requires the algebra of congruences. For more on this, see Victor J. Katz's review of Marcia Ascher's "Mathematics from Elsewhere: an Exploration of Ideas Across Cultures", 2002.)

However, it is on top of this basic peer-to-peer protocol that the Oromo polity is overlay, including, in the past, the socioeconomic activities of the society. With the Gadaa system which is without hierarchy and centralized orchestration, the people defended their interest and went about conducting their affairs in a democratic and meritocratic manner.

3.3. Toward a Digital Synthesis of Gadaa

Normally a social contract like the Gadaa protocol would be written as a constitution. As the Gadaa protocol is not written, and events are not properly recorded, the process has to rely on the collective memory of the people, particularly the capacity of elderly experts. Keeping track of historical events and agreements reached after lengthy conversations becomes difficult. For an external observer, the democratic process might be mistaken for a gerontocracy.

Beyond a record of history, a practical problem would certainly be conducting Gadaa assemblies at scale. It may be possible for a thousand or so people to make 'decisions by the shade', say sitting by the sacred "oda" tree of the Oromo, but this is impossible for millions of people who may be at different locations.

Before presenting BitGadaa, we ask two questions that it aims to answer.

a. How can Gadaa be simulated at scale as a peer-to-peer protocol?

b. How can Gadaa be emulated so as to match and surpass its past functions?

The first question is about bringing Gadaa to cyberspace, a basic synthesis. The second focuses on adding value to Gadaa as it was in the *past* so it could serve the people better in the *future*.

The above questions will be answered through a technology-based vision, *BitGadaa*, which can be thought of as a twenty-first century reincarnation of Gadaa in a Network Society.

4. The BitGadaa System

4.1. Fundamental Problem

We have argued that the essence of Gadaa is consensus. As it happens consensus among geographically distributed agents is a fundamental problem in computer science. What we want BitGadaa to be is a peer-to-peer social operating system, with software code realizing the Gadaa protocol. When we aim at reconstructing Gadaa in cyberspace, and call it BitGadaa, what we are looking at is an age Lawrence Lessig once succinctly described, saying, "code is law".

BitGadaa cannot be a centralized software controlled by someone if it is to faithfully simulate Gadaa. Until recently building trustworthy and distributed

software that is not controlled by anyone (including its creators) and requires consensus was almost impossible.

Everything changed in 2008.

4.2. Blockchain Technology

The Rai stones of the Yap people in Micronesia served as a way to maintain information about who owned how much. It was an early form of a public ledger that depended solely on the collective memory of the people. The case of Gadaa – that it is based on oral history and its constitution unwritten – bears resemblance to the Rai stones. For a small scale community where trust is not an issue, both the Gadaa process and Rai-stone economics can rely on memory. That there is consensus is implicit.

How about scaling to millions? How about people who don't know each other and can not be expected to trust each other? To go beyond consensus as a social process among people deciding by the shade, and scale to millions of people in a trustworthy manner, we need *consensus algorithms*.

The consensus problem in computer science has been studied for decades. The first practical solution came in the form of a peer-to-peer currency when Satoshi Nakamoto introduced the *blockchain*, in 2008, applying clever mathematics to solve a fundamental problem.

The blockchain is nothing more than a public ledger - only digital. It is not that different from a record of Rai stones or the evolution of the Gadaa process over time as told by oral historians. No single entity can change what happened in the past and a consensus is required to change the future.

People have since studied the blockchain and imagined many applications. Once you have a truthful record of social consensus that cannot be manipulated by someone at will, the opportunities are limitless. And BitGadaa is one among many futuristic systems. How do we realize it though? To answer this question we have to introduce smart contracts and distributed virtual machines.

4.3. Smart Contracts and Distributed Virtual Machines

Blockchains enable the construction of social institutions in a peer-to-peer, trustworthy, and scalable manner. A blockchain can be programmed to encode logic (say about a social relationship) and can execute it in a distributed manner on all nodes in the network. Code written for blockchains (and similar consensus ledgers) is known as a "smart contract". The network that allows smart contracts to self-enforce is a distributed virtual machine, appropriately updating the blockchain based on consensus.

4.4. BitGadaa as a DAO

A mathematical social contract like the Gadaa protocol can readily be encoded as a set of smart contracts, forming what has come to be known as a Decentralized Autonomous Organization (DAO). If a society (say the Oromo) chooses to govern itself with a DAO (say BitGadaa), a so-called Decentralized Autonomous Society (DAS) emerges.

4.5. Practicalities

BitGadaa realizes Gadaa, which we characterized as a *reputation-based peer-to-peer governance protocol with spatio-temporal classification*. The DAO will have, in addition to basic network formation and conversation/consensus functionality, additional algorithms for reputation management, automated role assignment, voting, peer-to-peer collaboration, tokenized rewards, etc. We believe the principles of Oromo democracy do inform design decisions reflected in the blockchain structure. BitGadaa in this sense is governance 2.0 built on an indigenous democracy.

Individuals should be able to access the BitGadaa peer-to-peer social network over the Internet using various means, including but not limited to mobile apps and web gateways. Extensions to the basic system should allow the development of additional functionalities in an open source manner.

One thing we should mention is that BitGadaa is not the only DAO being designed. It shares common functionality and design rationale with the likes of BitCongress and Bitnation, which we will compare it with next.

4.6. (Bit)Gadaa and (Bit)Congress

There are two main differences between Gadaa (and other institutions in Oromo polity) and US Congress. First, the Gadaa constitution is hitherto unwritten. Second, the Gadaa assembly is open to everyone, not only to a few. One can draw lessons from the other; an obvious example is making laws drafted via BitGadaa to be available in written form. It should be noted that consensus is once again key here. Law amendment in Gadaa could not be done by a single individual or even few people; "everyone" should agree.

There is a project called *BitCongress* that aims at blockchain-based voting, and collaborative law drafting which could, in theory, replace Congress. BitGadaa can leverage parts of this platform should it be made available. The late Donald Levine who commented on the complexity of Gadaa, is known to have said "I only wish Congress operated more like Gumii [Gadaa assembly]". What both BitCongress and BitGadaa attempt to do is empower people so they can decide on their fate by leveraging technology through direct democracy. Perhaps such learning and cultural integration is what Asmarom Legesse meant when he said "... the complementary integration of many diverse cultures."

4.7. BitGadaa and Bitnation

Entrepreneurs have seen an opportunity to provide governance services (like identity, marriage, land titles, basic income, etc.) using blockchain technology. The *Bitnation* project aims at doing just that. Some of the technology behind it and similar projects could eventually be integrated into BitGadaa so as to make it a turnkey alternative to the Nation State as we know it.

5. Discussion and Conclusion

We believe that *BitGadaa* has the potential to answer the two questions we raised regarding simulation and emulation of *Gadaa* in cyberspace. The basic protocol is realized as a smart contract-based DAO. This effectively makes BitGadaa a *simulation* of Gadaa. The flexibility offered by digital automation (and programmability) allows us to surpass the traditional Gadaa, in terms of scaling, for example. Furthermore, we have linked BitGadaa with complimentary efforts that allow for simple integration of additional functionality to the system. We can then say BitGadaa is an *emulation* of Gadaa.

But, what does this all mean? How are we to comprehend the whole initiative? What do we learn from BitGadaa?

5.1. BitGadaa as Gadaa

The simulation of the Gadaa process described by Asmarom Legesse [1973] doesn't involve culturally situated agents. BitGadaa as a simulation of Gadaa gives agency to the Oromo in cyberspace who can use it as a medium to conduct some of their affairs. So the former simulation is one of understanding and verifying, while the latter is about synthesizing and reconstructing Gadaa.

The parameters of the BitGadaa protocol are flexible by design. For example, the number 8 could represent months instead of years. Or the round robin algorithm for the 5 parties could be replaced with a voting scheme. BitGadaa could be instantiated for different scenarios with different settings. For instance, the functionality of the system can be demonstrated over a one-year period instead of eight years by appropriately setting the parameters.

The simulation of Gadaa as BitGadaa will create what postmodern philosopher Jean Baudrillard refers to as a *simulacrum*. The practically non-existent Gadaa (for which a real copy is not readily available, only its symbols remain) is imitated in a different medium as BitGadaa, which serves an equivalent functionality (and more). Furthermore, since the BitGadaa endeavor is practical, there is no need to be bound by the complex rules in the structure of Gadaa as long as the principles are retained and the system serves some purpose. Indeed BitGadaa is identical in terms of principles and borrows the basic structure of Gadaa as well as its nomenclature. Gadaa is known to have evolved over the past five centuries.

So, should the Oromo decide, BitGadaa (or a similar system) could be taken as a natural evolution of the Gadaa System. Over time, (Bit)Gadaa becomes real.

5.2. General Remarks

5.2.1 Past Ideas, Future Technologies

Ideas such as decentralization, keeping a public ledger of some sort, the distribution of power based on reputation, etc. that are evident in past systems such as *Gadaa* are now central to contemporary ideas and movements such as collaborative commons, distributed governance, reputation as capital, etc. It seems that ideas from the past could go mainstream in the future through appropriate technology.

5.2.2 Identity in the Network Society

However future social organizations are going to look like, individuals are likely to keep their cultures. (For an interesting take on this subject, see Manuel Castells' trilogy "The Information Age: Economy, Society and Culture"). The Network Society, albeit borderless and decentralized, is bound to have numerous cultural and ideological cliques as a result of technology-enabled ease of voluntary association. The case of (Bit)Gadaa is only one among many such associations.

5.2.3 African Development, Conscientization, and Technology

Individuals need to have critical consciousness akin to Paulo Freire's *conscientização* in order to reflect on the past and future of the world they occupy so as to change it. People should be in a position to be aware of what works well (or has worked well) in their environment and try to amplify it using technology. With decentralized technologies such as the blockchain, African visionaries now have the opportunity to innovate. Initiatives such as BitGadaa are more likely to empower people than borrowed solutions to African problems.

5.3. Summary

We have discussed how the future can be informed by the past and how the traditional could be modernized with past ideas realized through future technologies. As a specific case, we have looked at Gadaa, an indigenous African democracy belonging to the Oromo, and its futuristic incarnation, BitGadaa, a democratic governance DAO in cyberspace. The Oromo aphorism "By remembering the past, the future is remembered" summarizes our thinking. Gadaa is a remembrance of the past, BitGadaa is a remembrance of the future.

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