15-Jun-2019  
  
Dear Prof. Zhang:  
  
I write you in regards to manuscript Paper-TW-Jan-19-0065, titled "Decentralized Blockchain Based Dynamic Spectrum Acquisition for Wireless Downlink Communications," which you submitted to IEEE Transactions on Wireless Communications.  
  
In view of the criticisms of the reviewers found at the bottom of this letter and based on my own reading, your manuscript has been denied publication in the IEEE Transactions on Wireless Communications.  
  
The major concern is that it's not well justified why Blockchain is the right technology for the proposed dynamic spectrum acquisition given the slow speed of PoW, small number of MVNOs, and potential security vulnerabilities. Furthermore, the proposed method is not compared with conventional ones. So its advantage is not clearly demonstrated.  
  
  
Thank you for considering IEEE Transactions on Wireless Communications for the publication of your research. I hope the outcome of this specific submission will not discourage you from the submission of future manuscripts.  
  
URL: <http://mc.manuscriptcentral.com/twc>  
  
Sincerely,  
  
Dr. Kai Zeng  
Editor, IEEE Transactions on Wireless Communications  
[kzeng2@gmu.edu](mailto:kzeng2@gmu.edu)  
  
Reviewer(s)' Comments to Author:  
Reviewer: 1  
  
Comments to the Corresponding Author  
Find attached.   
  
Reviewer: 2  
  
Comments to the Corresponding Author  
This paper presents a decentralized blockchain based dynamic spectrum acquisition scheme for a wireless downlink communication system with multiple MVNOs. The proposed scheme aims to minimize the total power consumption of all MVNOs while meets the average transmission rate. The theoretical analysis is solid. However, my major concern of this work is the necessity of blockchain.   
  
1. The authors mentioned there will be issue if the central node is under attack. I agreed with that. However, the blockchain won’t solve the problem in the MVNOs scenario. One basic rule of PoW kind of blockchain is no one should control over 50% computation power (a.k.a. 51% attack). Large number of non-collusion miners could prevent such attack at a high possibility. However, it seems the number of MVNOs cannot meet such requirement, which would make it vulnerable for the 51% attack.  
  
2. The small number of MVNOs could lead another problem. Fake information (such as $z\_m$, $u\_m$) could be easily injected into blockchain by malicious malicious MVNO. Since the result of next iteration is built on the previous iteration and the information from the peers, the fake information could easily expand over whole network and make the ultimate result incorrect.  
  
3. Another issue is that the transaction finality of PoW kind of blockchain is slow, which means it is not a good candidate for real-time application (such as MVNOs).  
  
4. It seems the manuscripts not well prepared, such as the inconsistency of notation “j-th MU in the i-th” against “n-th MU in the m-th”.   
  
Reviewer: 3  
  
Comments to the Corresponding Author  
The paper proposes a Blockchain based dynamic spectrum acquisition scheme for the wireless downlink communcation, which aims to minimize the sum transmit power at all MVNOs while satisfying the average data transmission rate thresholds.  
  
There are several issues left unclear or undiscovered. My main concerns are as follows:  
  
1) The author mentioned the network visualization involves MNOs and MVNOs. The detailed discussion of spectrum leasing process is needed for the purpose of better understanding.  
  
2) ADMM is introduced in this work to obtain the global optimal  
solution to aforementioned optimization problem. An essential assumption author made in the manuscript is that variable z and u can be updated or acquired from the blockchain. I noticed that this is the only place involves the blockchain technology. What the system scheme of blockchain based dynamic spectrum acquisition looks like? Is that server-based or mobile device-based? What is the issue existed in blockchain platform while implementing the proposed scheme?   
  
3) Most importantly, in the process of running the ADMM based optimization algorithm, the variables z and u are supposed to be updated and acquired instantly on blockchain. I believe the speed of optimization algorithm will be slowed down due to the high mining complexity and consensus overhead. Author needs to justify feasibility of proposed scheme in this aspect.    
  
4) The spectrum acquisition is performed several minutes? Is this a reasonable assumption for the lantency-aware dynamic spectrum acquisition system?  
  
5) Author needs to fix the typos like "smart phone" and change the word in "actual required minimum sum transmit power" into "actually required minimum sum transmit power".