REMARKS: THE ORIGIN OF QUORUM SYSTEMS

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Following the publication of the article on "The Origin of Quorum Systems" in the last issue of the BEATCS Distributed Computing column, Leslie Lamport and Paul Vitányi rightfully remarked that the article is missing a few (significant) bits in the quorum systems history, such as [1] and [2, 3].

Lamport's work in [1], which deals with fault-tolerant state machine replication in synchronous systems, arguably belongs to the dawn of quorum systems. Interestingly, in [1], Lamport even refers to quorums as "amoebas", arguing that a useful "amoeba" should be "large enough", i.e., contain a majority (of processes).

On the other hand, evolution requires reproduction, which is itself intuitively better with the right match-making. Hence, distributed match-making, studied by Mullender and Vitányi in [2, 3], is a significant piece of the story about the evolution of quorum systems. Informally, a distributed match involving two sets of processes is made if a common "rendez-vous" element exists, i.e., (and less romantically) if two quorums have a non-empty intersection. Mullender and Vitányi use distributed match-making as a generic approach to implement several distributed services, including name service, mutual exclusion and replicated storage. Besides, [3] is one of the very early papers to deal with probabilistic quorum intersections.

I am very grateful to Leslie Lamport and Paul Vitányi for their interest in the article and their remarks. Although the goal of the article was not to provide a comprehensive survey on quorum systems (as mentioned in page 126), I plan to further discuss these papers (as well as other relevant work that might be brought to my attention) in an extended version of my article.

References

[1] Leslie Lamport. The implementation of reliable distributed multiprocess systems. *Computer Networks*, 2:95–114, 1978.

[2] Sape J. Mullender and Paul M. B. Vitányi. Distributed match-making for processes in computer networks (preliminary version). *Operating Systems Review*, 20(2):54–64, 1986.

[3] Sape J. Mullender and Paul M. B. Vitányi. Distributed match-making. *Algorithmica*, 3:367–391, 1988.