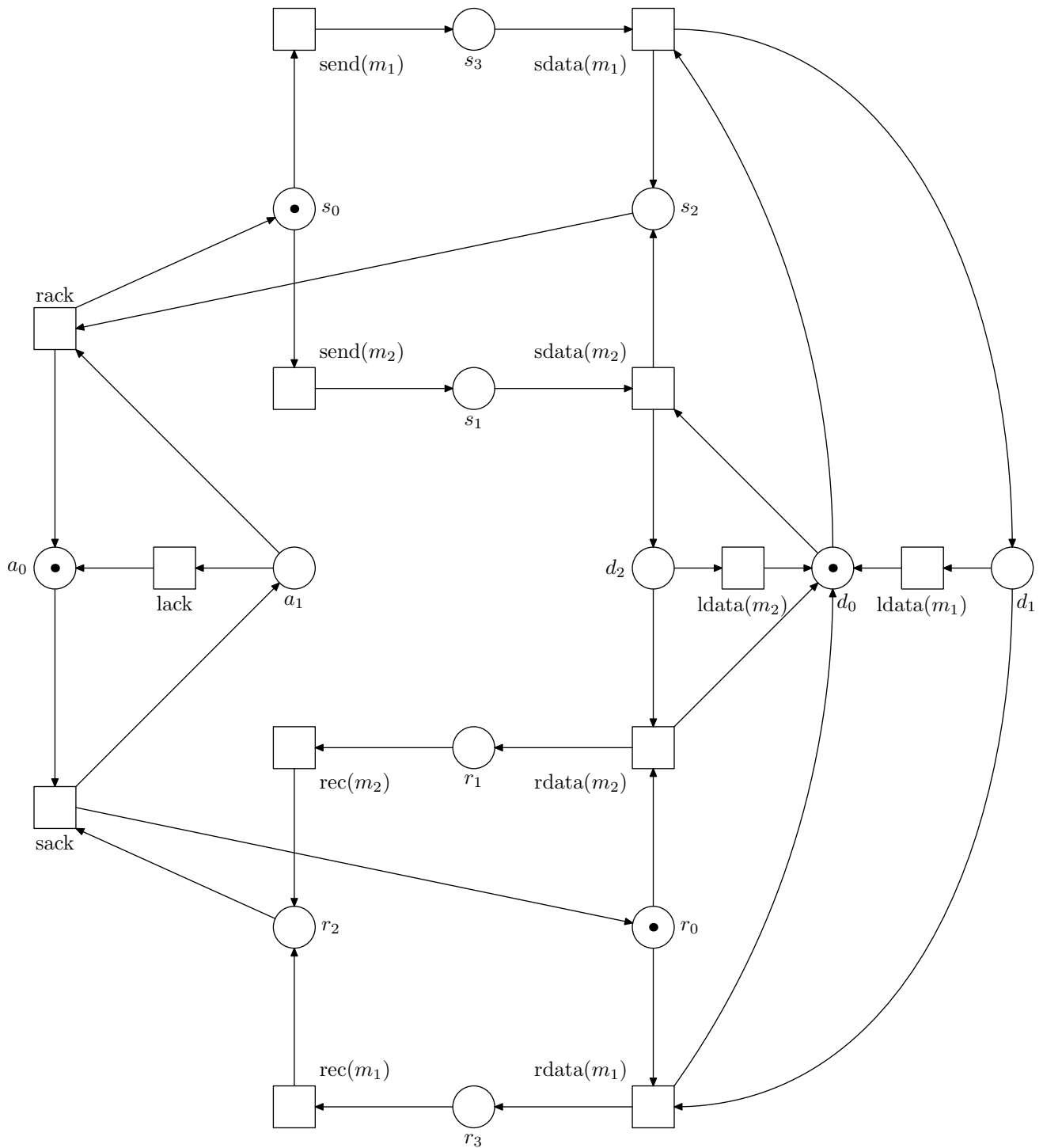1. Below is presented a Petri Net modelling a simple protocol.

(a) Perform reachability analysis to the net

(b) Will the receiver always receive a sent message? Is it possible that the receiver gets multiple copies of a message that was sent only once? Can the protocol deadlock?

(c) How one could simplify the model?

2. A timer can be added to the protocol. The timer will go off if the sender has to wait too long for acknowledgement. The timer is modelled with *timeout* transition. The identities of the messages can also be removed. The result will be the following Petri Net.
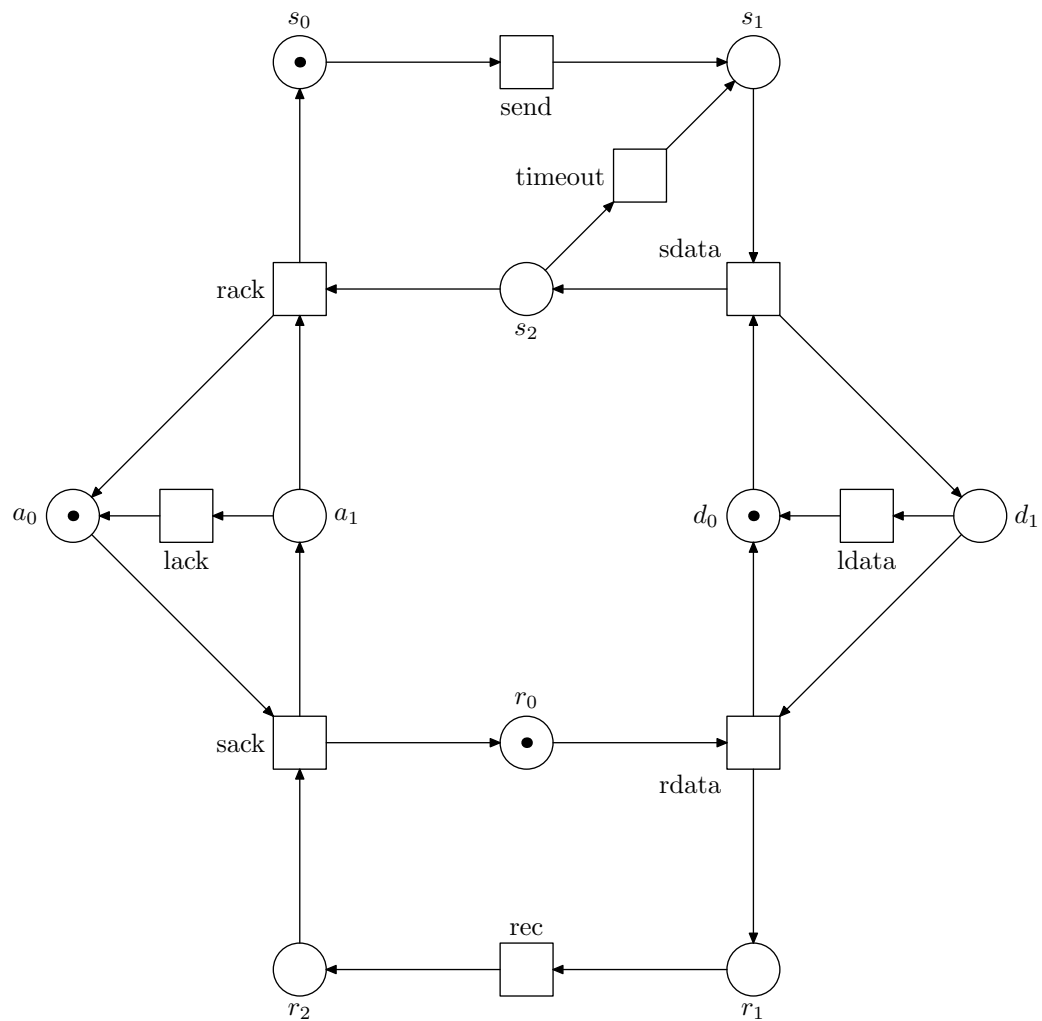
Does the protocol now work correctly?

If one wants to examine the situation where the transmission channel is reliable but the timeout is set to be too quick, one can remove the transitions ldata and lack from the net. Does the protocol work in this situation?