Sharing the costs of a multiswitch upgrade: a suggestion

Let's take as an example a block of six privately-owned flats. Communal expenses like the gardening and external decoration are dealt with by the residents' association, or RA. The TV system provides each flat with only one satellite feed. One person would like two feeds, but there are no spare outputs on the multiswitch. No-one else is interested so the other five don't want to share the cost. The resident has to pay for the supply and installation of a bigger multiswitch (and the cable to his flat). It probably means replacing a 6-output switch with a 12-output one, just to get one more output. Five outputs are then spare.

Over a period of time other residents decide, one by one, that they want a second feed after all. The first man had paid for the switch yet the others are making use of it. Here's how to make it fair. The RA orders the work in the first place, and recharges the whole amount to Resident One, who is then the notional owner of seven of the 12 available outputs.

When Resident Two wants a second feed he pays the RA half of the amount originally paid by Resident One. The RA gives this money to Resident One. The outputs are now owned as follows:

Resident	No of outputs owned
1	4
2	4
3	1
4	1
5	1
6	1

Resident three then wants a second feed. The RA charges him one third of the amount originally paid by Resident 1, and gives half of this money to each of Residents 1 and 2. The outputs are now owned as follows:

Resident	No of outputs owned
1	3
2	3
3	3
4	1
5	1
6	1

Resident four then wants a second feed. The RA charges him one quarter of the amount originally paid by Resident 1, and gives one third of this money to each of Residents 1, 2, and 3. The outputs are now owned as follows:

Resident	No of outputs owned
1	2.5
2	2.5
3	2.5
4	2.5
5	1
6	1

Resident five then wants a second feed. The RA charges him one fifth of the amount originally paid by Resident 1, and gives one quarter of this money to each of Residents 1, 2, 3, and 4. The outputs are now owned as follows:

Resident	No of outputs owned
1	2.2
2	2.2
3	2.2
4	2.2
5	2.2
6	1

Resident six then wants a second feed. The RA charges him one sixth of the amount originally paid by Resident 1, and gives one fifth of this money to each of Residents 1, 2, 3, 4 and 5. The outputs are now owned as follows:

Resident	No of outputs owned
1	2
2	2
3	2
4	2
5	2
6	2

This method of sharing the cost just covers the multiswitch and its accessories, not the cable to the flat and the wallplate. Those items are charged directly to each resident at the time of installation. The amount is likely to vary because the cable runs will differ.

Although I've referred to a Resident's Association, the same principle could apply if a management agent looked after the building.