Problem:
You have an old S5 system, and now you must upgrade it to S7. What to do with the hardware ?

If you have a control system that is important for your application/product/process/whatever, then you should immediately start to plan how you exchange the old S5 hardware to something newer.

Siemens announced the phase-out period for more than 10 years ago, and now all S5 products are on the spare-parts list. This means that they are expensive, takes a long time to acquire, and Siemens will often demand that they get the defective part in exchange for a repaired one. Sometime in the future it will not be possible to get spares. Some of the more rarely used modules cannot be purchased as spares any longer already.
Therefore I strongly warn against even considering using the old S5 hardware any more.

To reuse the i/o for example and only exchange CPU, is only recommended if an exchange cannot be done in one go. And then this shall only be an interim solution until the real upgrade is done (= removal of all S5 hardware).

Do not consider to reuse the old S5 i/o in order to “save money” !

If you are in the situation that you have just experienced a long downtime because some S5 hardware failed, and you didn’t have a spare in stock, then someone failed to take action in due time. And if your management now demand that you fix the problem by reusing some of the old S5 hardware, then the best you can do is to tell them the truth.

Now if you are aware of the above, you can consider your options which depend on the S5 hardware in use.

List of possible solutions:

1. Exchange all S5 hardware without reusing anything except the i/o wiring.

If you carefully plan how to place the new hardware, and if there is some slack in the wiring, you can probably reuse the existing wiring.
I have succesfully participated in projects that used this method to upgrade.
The trick is to plan the switchover well in advance, and to have all the new programs finished beforehand through simulation.

This is my favourite. It is slightly more work intensive, but the result will probably be more compact and less expensive than any other solution.

2. (only for S5-115U/135U) Phoenix Contact have a series of adapters that can interconnect an S5-115U or 135U terminal strip with an S7-300 or S7-400 terminal strip.
You will have to use Phoenix Contact terminal adapters with the type nr."FLKM S115/S7/FLK50/PLC/SO137"
This adapter connects to a similar S7-300/S7-400 adapter by means of a ribbon cable.
Because of the dual adapter+ribbon cable I find this solution an awful cludge.

3. (only for S5-115U/135U)Install an IM308C in the old S5 rack, and retain the S5 hardware. Then connect this to a new Profibus DP master.
The old CPU in the S5 rack will remain active, so the i/o data has to exchanged with the new master programmatically via the user program.
The connection in the IM308C will have to setup with COM PROFIBUS software.
The only big step forward with this solution in terms of “upgrade” is that a more powerful CPU (S7 for example) can take over the user program. So for all the expense and effort, it does not achieve much.
Be warned that this will retain the old S5 hardware that has only a limited remaining lifetime. This I do not recommend as spare parts will be expensive, and maybe difficult to acquire in a hurry.

4. (only for S5-115U/135U) If the new PLC system is an S7-400, you can then insert an S5 interface module in the S7-400 (IM463-2).
There have to be IM314 modules in the S5 racks which have to be expansion racks, not central racks. You may have to exchange a central rack with an expansion rack.
There are several limitations as to how many IM463-2 and IM314 modules that can be used.
Be warned that this will retain the old S5 hardware that has only a limited remaining lifetime. This I do not recommend as spare parts will be expensive, and maybe difficult to acquire in a hurry.

5. (only for S5-135U/155U)Use an S7-400 rack to connect to the terminal blocks of the old S5 i/o.
You will have to use terminal block adapters that start with Siemens type no "6EZ2041-..."
Phoenix Contact have similar adapters of the type "FLKM S135..."

If your CPU is not an S7-400, then you can setup the S7-400 rack as a Profibus DP slave.
There is no DP slave adapter for the S7-400 line, but as a workaround, you can use the smallest CPU 412-1 and set it up as a DP slave on its onboard MPI/DP interface.
The hardware i/o then has to be exchanged with the Profibus "i/o" via the user program.

The huge advantage with this solution is that the i/o wiring can be exchanged in the shortest possible time.
Also, an S7-400 rack will fit in aproximately the same space as the old S5-135U or S5-155 rack.

Notes:

a. For S5-90U, 95U, 100U, 101U there are no other option than no.1
There is no hardware that is directly compatible.

b. The big “killer” regardless of which solution you chose, is if there has been used specialty modules in the old S5 hardware. You may find that you have to adapt the exchanged system heavily. Or you have to exchange some devices in the plant/proces/machine/whatever to accommodate the new system, rather than trying to make the new system work with the old hardware.
Notice that it is exactly these specialty modules that are the hardest to troubleshoot, and the hardest to get spares for.

c. Regarding communication, then any newer solution will be so much better than the old S5, that it makes sense to try and reap the benefit of the new capabilities. Therefore, if possible try not to shoehorn an old communication setup into the new system.

d. Regarding HMI, then if the old system uses a mimic diagram with lots of pushbutton and lamps, then you should consider to go with a panel or PC based HMI solution. In old systems with a comprehensive mimic, maybe a third of all i/o is just for the mimic. By stripping this out you minimize the new hardware solution.