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FAT filesystems represent files via linked lists of clusters (linked file allocation).

They have a region on disk for one or more tables (File Allocation Table) which have as many entries as addressable clusters. Each entry can be:

* a pointer to the next cluster in a file's linked list
* a marker to indicate the last cluster of a linked list
* an Unused marker
* a Bad marker

For symbolic links, my guess is that the FAT can not point to or store a file path as ext file systems do. The closest thing I can think of would be to point to the head of a linked list, which would require some sort of maintenance.

For hard links, FAT filesystems lack a file node that can be 'shared' among files. There would also be no way to keep track of the number of links to a file.

For the file system, I suppose the answer is "because it wasn't designed that way". That is, since none of the operating systems that used it as a main filesystem didn't want, need, or even came up with the idea of symbolic links, they weren't implemented.

As for the file system implementation/driver, support for symbolic links could in theory be added, but the file system needs a way to mark the file as a link, instead of a regular file (the link text can be stored like normal file data). Since the feature was never implemented, there's no pre-existing way to do that. One would need to pick some field of the directory entry to mark a file as a link, but then the implementation would not be compatible with other implementations. In the least, other systems would probably not bother to add support for the links, so they would not be supported.Also, note that FAT is quite an old filesystem, and mostly only used in cases where interoperability is considered useful. With that in mind, changes to the existing standard are a bad idea, and for serious use, all operating systems have better file systems that support links, amongst other things.Hard links are even harder, since they pretty much rely on having the file name in a different place from the rest of the metadata. On Unix-type file systems, the inode holds most of the metadata, and directories just contain pointers to the inode. On FAT, the directory entry contains the name and all other metadata, so there's no one place to keep the metadata of a file with more than one hard link to it.