Many people associate the term “automated code conversion” with compiler-like tools, which parse legacy source code and produce new source code in a different language with 100% automation. Such tools encounter a number of challenges and limitations when applied in the context of modernizing enterprise information systems. This presentation explores these challenges based on a broad spectrum of experience with real projects. Topics include undocumented legacy compiler “features”, why modernization must do more than just replicate functionality using new technologies, and the need to introduce proper application architectures when modernizing. The purpose of this discussion is to illustrate why more comprehensive approaches are normally needed when applying automation to application modernization efforts.