The study was designed to evaluate the current manual circulation system in Nigerian academic libraries and develop a possible replacement that is ICT-compliant. A sample of 18 academic libraries was selected from a population of 117 using the simple random sampling technique. The system analysis and design methodology was adopted for the study. Interview, record inspection and observation were used to obtain data for the study. A top-down, menu-driven interactive program was developed using dBase III+ and implemented on a Leading Edge 486 microcomputer with MS-DOS version 6. The new computer–based circulation system has eliminated the problems of the manual process, brought speed, accuracy and consistency into record-keeping.