In recent years, very large efforts have been directed toward the development of a variety of technologies that offer the prospect of addressing limitations in conventional active matrix, liquid crystal displays (AMLCDs). Thin-film processes based on amorphous silicon and polycrystalline silicon are being developed for deposition on flexible plastic substrates in order to overcome the fragility and weight of traditional flat-panel displays deposited on thin glass substrates. In parallel, electronics based on small molecule and polymer organic semiconductor materials are presently undergoing rapid development and commercialization. Such organic technologies have already demonstrated fabrication of dynamic digital displays on rigid or flexible surfaces using jet-printing technology – which could ultimately reduce the cost of display fabrication facilities by well over an order of magnitude compared to those of standard AMLCD technology. Given these developments, it is intriguing to examine the prospect of utilizing these novel technologies to create inexpensive and/or flexible active matrix x-ray imagers. Beyond the important advantages of reducing the fragility and high cost of present active matrix flat-panel imagers (AMFPIs), flexible imagers would open up new possibilities and applications for devices that could mechanically conform to exterior or interior surfaces of a patient or provide novel curvilinear detection geometries. In this presentation, the historical beginnings and evolution of active matrix imagers will be reviewed and limiting factors affecting their performance and manufacture will be discussed. A general description of how flexible digital imagers, and other innovations, could address these limitations will be presented. Finally, some of the interesting ways in which such imagers could be used will be described.