



Standard Guide for Rapid Prototyping of Computerized Systems¹

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1. Scope

1.1 This guide covers a rapid prototyping method for developing computerized systems. Intended readers of this guide are people who develop computerized systems, and students and teachers of system development methods.

1.2 Rapid prototyping is an approach to developing computerized systems which produces a working model more quickly than conventional approaches. Where conventional methods concentrate on preparing functional requirements and functional design documents that describe the needed system, rapid prototyping methods concentrate on preparing a working prototype. Users and developers learn the functional requirements and an appropriate system design by interacting with a series of prototypes, each of which is rapidly produced from a starting framework or from an earlier version. A prototype can evolve into an operational system, it can serve as an exact behavioral specification of an operational system, or it can be used to explore the feasibility of a new idea or design which can be incorporated in a larger system. The method is rapid in preparing each version of the prototype, but the overall time required for system development may be more or less than the time required with conventional methods.

1.3 Rapid prototyping is most appropriate when the functional requirements or functional design for a system are not well understood, or when experimentation is required to explore some aspect of system behavior. It is not appropriate in hazardous settings, or when the requirements are well understood.

1.4 The guide recommends use of prototyping tools, but it is not a standard for the tools themselves. It does not cover executable specification tools. Transforming a prototype that is used to clarify requirements into an operational system is discussed briefly in Section 8 and in detail in other referenced standards (see 2.1).

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appro-*

priate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

- E 622 Guide for Developing Computerized Systems²
- E 625 Guide for Training Users of Computerized Systems²
- E 627 Guide for Documenting Computerized Systems²
- E 731 Guide for the Selection and Acquisition of Commercially Available Computerized Systems²
- E 919 Specification for Software Documentation for a Computerized System²
- E 1013 Terminology Relating to Computerized Systems²
- E 1029 Guide for Documentation of Clinical Laboratory Computer Systems²

2.2 ANSI Standards:

- ANSI/MIL-STD-1815A Ada Programming Language³
- ANSI/X3.9 Programming Language FORTRAN³
- ANSI/X3.159 Programming Language C³
- ANSI/X11.1 MUMPS Programming Language³
- ANSI/IEEE 729 Glossary of Software Engineering Terminology³
- ANSI/IEEE 770 X3.97 Pascal Programming Language³
- ANSI/IEEE 1063 User Documentation for Computer Software⁴

3. Terminology

3.1 *Definitions*—For definitions of terms relating to computerized systems, refer to Terminology E 1013, IEEE 729, and ANDIP.⁵

3.1.1 *fourth generation language, n*—a high-level computer language that incorporates data structures and procedures for a specific problem domain.

3.1.2 *prototype, n*—an original or model from which a system is copied.

3.1.3 *prototype, v*—to create an original or model.

² Annual Book of ASTM Standards, Vol 14.01.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁴ Available from the Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th Street, New York, NY 10017.

⁵ American National Dictionary for Information Processing Systems, Information Processing Systems Technical Report X3/TR-1-82, Dow Jones-Irwin, Homewood, IL.

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