

Documenting Software History

by
Mike Blasgen, Peter Capek, Burt Grad, Paul McJones, Bob
Patrick, Bernard Peuto

As reported by Bernard L. Peuto,

Documenting Software History

May 15, 2007



Table of Content

- Motivation
- Museum Landscape
- Software Is Unique
- Current Time Line Project
- Guiding Principles
- Fighting the Artifact Demons
- The Framework
- Categories & Topics
- Types of Entries
- Selecting an Entry
- Sample Topics
- Selected Topic Reviews
- Search for Applications & Users
- Statements
- Take Away Messages
- Next Steps
- Appendix

Documenting Software History

May 15, 2007



Motivation

- Help with CHM Time Line
 - Responding to request for feedback and help from the CHM Time Line committee
- Create a priority & vision document for SPG
 - Obvious preservation priority of cited entries
 - Create a framework to invite others to contribute
 - Post it for feedback
- An expandable pilot project
 - Realistically focused on the Time Line needs
 - Limited resources
 - Expandable to a much deeper Web based Software History
- Somewhat independent effort
 - To understand better software unique constraints
 - This will require a merging exercise with other inputs without too much delay
- To have fun

Documenting Software History

May 15, 2007



Museum Landscape

- Physical Artifact Oriented
 - Trains in Sacramento, planes in Washington D.C.
 - Photos and movies do not do justice to the physical proximity
 - New musee des art premiers in Paris
 - No realistic understanding of the context just the beauty of the objects
 - Caravaggio & Rembrandt exhibit in Amsterdam
 - Self viewing must see block buster exhibit
- Institution oriented
 - Delivering a group or family experience
 - Louvre, Guggenheim, Getty
 - Research collections
- Impact of the Web
 - Some of the richer institutions have both physical and Web presence
 - Different visitor experiences and constraints
 - By its nature software will exacerbate the contrast

Documenting Software History

May 15, 2007



Software Is Unique

- Software is an information artifact
- Software is basically a content experience
 - Source code & interactive experience
 - And many more
 - Physical media is less important
- Software requires more context than H/W
- But software collecting is off the scale
 - The numbers are massive
 - 10 to 1, 100 to 1, 1000 to 1 for each hardware environment
- The web is eminently suited for software collecting
 - Little resources needed to store and gather
 - Requires no permission
 - It's all in the interpretation / curation
- Software exhibiting is yet to be well understood

Documenting Software History

May 15, 2007



Current Time Line Project

- Time Line draft document
 - Somewhat driven by the physical exhibit requirements
 - Started as a list of physical objects
 - Stronger on structural exhibit issues
 - Weaker on message issues
 - Took a milestone orientation
 - Somewhat hardware oriented
 - Understood that software required more work
 - Thus the request for contributions by the Time Line exhibit group
- Feedback from historians
 - Timeline and artifact focus are common & possible but make it harder to highlight the take away messages
 - Xx
 - xx

Documenting Software History

May 15, 2007



Guiding Principles

- Our goal is to map software history and understand its challenges and successes.
 - We will avoid, unless essential, the realms of computer hardware and its technology.
- We will concentrate on software that created the world as we know it.
 - To avoid being overwhelmed by the total volume of computing software.
- Our output must be adaptive and extensible to avoid the endless arguments concerning what is most important.
 - While we will exercise our collective experience and judgment to focus on software that we believe “created our industry as we know it,” other individuals or teams may find important omissions.
 - Our robust and wide ranging framework must allow the support of many views and the easy additions and changes of entries

Documenting Software History

May 15, 2007



Guiding Principles (Cont.)

- If this report is useful, additional (volunteer) industry and academic experts will be recruited to deal with the many topics where we lack personal expertise.
 - Only by expanding our efforts can the large job we foresee be accomplished in a reasonable amount of time, providing useful input to the CHM Timeline planning effort.
- We see a clear line of demarcation between the software knowledge we are capable of addressing, and the preparation of displays and exhibits for the public.
 - As individuals we may make some suggestions about possible exhibits, but this is not the thrust of our team effort.

Documenting Software History

May 15, 2007



Fighting the Artifact Demons

- Software, having no significant physical artifacts, is difficult to integrate with a timeline and artifact focus hardware driven exhibit.
- Instead software requires understanding and documenting
 - What led to this product and event
 - What problems or users were targeted
 - What were its consequences
- Despite these goals it is hard for engineers and non historians to avoid falling back on a list of favorite products

Documenting Software History

May 15, 2007



Fighting the Artifact Demons (Cont.)

- So we tried to establish a framework with major categories, topics and entries that would get us closer to describing the changes and events (Hardware technology, software technologies, economics, markets, architecture and external) interacting and contributing to the forward march
- This will get us closer to establishing the stories and the key take away messages that should organize our historical view
- In the meantime such an expandable framework is a convenient way to organize the list of products and events that are likely to be described in the overall Time Line anyway

Documenting Software History

May 15, 2007



The Framework

- The view is of a matrix or table, whose horizontal axis is a timeline starting in the 1950s and stretching to the 1990s.
 - The axis is somewhat flexible in that it can be thought of as each year during that period
 - or it can be thought of in terms of 5 or 10 year periods depending on the elements to be identified.
- On the vertical axis we envision the Categories which bridge the various major software groupings and then within each Category,
 - the major Topics that comprise that Category,
 - and then the significant Entries which exist within each Topic.

Documenting Software History

May 15, 2007



The Framework (Cont.)

- One could link the entries, topics and categories in as set of planes or views that would identify software
 - by the type of businesses which used it large enterprises, medium/small enterprises, home and personal use, and affinity groups
 - Or by the various classes of computer hardware which have defined the industry mainframes, minicomputers, small business machines, personal computers, Internet-based systems.
- More interestingly the critical take away messages should be viewed as threads which connect Categories, Topics and Entries with each other.
 - These same kinds of threads can connect across the different planes.
- With a similar set of hardware tables we could also picture the interconnections among the software and hardware planes.
- This framework includes categories for all of the other elements which have shaped the entire computing industry such as government, standards, media, financial support.

Documenting Software History

May 15, 2007



Categories & Topics

- **To make us focus on essential entries we try to limit ourselves for this version of the report to 5 or less categories and topics**
- **Computer-oriented Software**
 - Operating Systems and System Management Tools
 - Programming Languages and Application Development Tools
 - Database Management Systems
 - Data Communications and Transaction Processing Systems
- **Applications-oriented Software**
 - Scientific and Technical Applications
 - Commercial Cross-Industry Applications
 - Commercial Industry-Specific applications
 - Embedded Applications
 - Consumer Applications
- **Other Computing-related Activities**
 - Legal, Government and Standards Activities
 - Media, Conferences and Associations
 - Computer Software and Services Companies
 - Financial Services, Marketing and Distribution Models
 - Education, Training and Research Activities

Documenting Software History

May 15, 2007



Type of Entries

- For this version of the report we limited the number of entries to 15 or so ranked as to Tier I, II or III (Tier I are the most important, Tier II are the runners-up and Tier III are the also-rans, e.g., significant, but not as important as the others)
- So for all categories and topics the total number of entries would be between 100 and 200
 - We do not expect all of the entries to be used in the Time Line
 - We do expect an initial web based software history site to cover all of these entries and a lot more in later versions.
- **Types of Entries**
 - Product
 - Program
 - Combination of H/W, S/W etc.
 - Technology
 - In a product or a demonstration
 - Seminal paper
 - Other events
 - IBM Consent Decree
 - Companies
 - Organizations

Documenting Software History

May 15, 2007



Selecting an Entry

- **Advancement in Technology**
 - New paradigm; e.g. visual programming for generating code or logic programming
- **Market significance**
 - Breath of usage or revenue
 - New Users
 - Expanded the circle of existing users/created new users, e.g. BASIC, Windows
- **Down stream influence on other products and applications**
 - Raised the Bar
 - A definitive improvement on practice or quality
 - Advanced the field
 - Program or algorithm that moved the field forward, e.g. genetic algorithms
- **First of a kind in opening up a new opportunity or market**
- **Other possible criteria (but infrequently used)**
 - Interesting Failure
 - Never shipped, sold badly, or did not enjoy much usage, but was important, e.g. GEM
 - Seminal Inventor
 - Written by someone who contributed in an important way, e.g. Bill Joy
 - Unique
 - Custom solution to an interesting problem, e.g. Space shuttle control program
 - >25 years old
 - Collected due to rarity, e.g. JOSS

Documenting Software History

May 15, 2007



Sample Topics

- Operating Systems (Bob Patrick)
- General Purpose Programming Languages (Paul McJones)
- Database Management Systems (Michael Blasgen)
- Scientific and Technical Applications (Peter Capek)
- Industry Influencers (Burt Grad and Ed Bride)
- Computer Software and Services Companies (Burt Grad)
- Legal and Government Actions (Burt Grad)

Documenting Software History

May 15, 2007



Report Status

- Our iterations and test topics have validated the categories, initial topic lists and entries' format
 - It was not obvious that we could use the same structure for programming languages, commercial applications and other computing related activities
- But the framework's description needs improvement
 - The tie to key messages is only being sketched
 - The introduction memo will need improvements
- On the test topics:
 - Programming language and application development tools (Paul McJones) is in best shape
 - Operating Systems (Bob Patrick) need more recent entries
 - Computer Software and Services Companies (Burt Grad) need added content
- A critical topic Commercial applications (which may represent the bulk of entries) need to be framed (See below)
- A lot more entries need to be added
 - By finding and enrolling numerous knowledge experts
- Our goal was to create a extendable framework for multiple contributors we are close to publishing it

Documenting Software History

May 15, 2007

17
COMPUTER
HISTORY
MUSEUM

Selected Topic Review

- Overall memo
- Programming language and application development tools (Paul McJones)
- Operating Systems (Bob Patrick)
- Computer Software and Services Companies (Burt Grad)

Documenting Software History

May 15, 2007

18
COMPUTER
HISTORY
MUSEUM

Statements

- Hardware rush for features and rush for speed have enabled a corresponding rush for software features and a dramatic increase in applications' scope.
- Hardware massive cost and size reductions have open larger and larger markets for software computing solutions
- Cost effectiveness of new applications is the major reason for new markets to emerge
- For the overwhelming majority of users the application and the software are undistinguishable
- There are many views possible to describe software applications
 - By type of business (large, medium etc.) (historically)
 - By type of hardware (mainframe, mini etc.) (historically)
 - By industry segments (financial, telecommunication, etc.)
 - Etc ...
- They are all describing the elephant!
- So what could be the take away?

Documenting Software History

May 15, 2007



19

Search for an Application View

- One possible way to explain the progress of computing is to focus on the applications where hardware and software applications made the greatest industrial impact
- This a potential ranked list of such applications:
 - Accounting and financial processing (put spreadsheets in here too)
 - Weapons systems (e.g., missiles, firing tables for artillery)
 - Telephony (e.g., message switching by telephone companies)
 - Inventory management
 - Manufacturing production (MRP, etc.)
 - Cad/Cam
 - Barcoding (you could argue it is an extension of inventory management but it was used for so many other things)
 - Avionics--(now extending to automatic instruction systems for automobiles)
 - Internet information searching
 - Word processing
 - e-mail--but also all the Internet spinoffs such as MySpace
- It would be very easy for visitors to follow such a view and thus should be considered but not exclusively;
 - As it provides no easy connection to many important embedded applications
 - And worse it has no technology thread that can be weaved easily.

Documenting Software History

May 15, 2007



20

Take Away Messages

- The forward march of computing is fed by:
 - New better, cheaper, faster and smaller hardware
 - Which opens existing and new markets for new users and new software applications
 - Which in turn feed demands for new hardware and software
- The fundamental principle is the interaction between technologies and user needs

Documenting Software History

May 15, 2007



Next Steps

- Solicit reviews and comments
- Fill all the known holes (See status above)
- Post on SPG web site
- Integrate better with other inputs
- New pass on messages
- Contact subject experts
- Next batch of topics
- Iterate

Documenting Software History

May 15, 2007



Appendix

Documenting Software History

May 15, 2007



23

Entry Format

- Name of the Topic
- Definition of the Topic
- Brief History of the Development or Evolution of the Topic (including Pre-history)
- List of the Selected Entries within the Topic (top 15 or so) ranked as to Tier I, II or III (Tier I are the most important, Tier II are the runners up and Tier III are the also rans, e.g., significant, but not as important as the others)
- For each Entry provide:
 - Reason why this Entry was selected per the guidelines for technology, market or other impact
 - Narrative description of the Entry
 - Entry Description Form (metadata)
 - Category
 - Topic
 - Entry Name
 - Date of Origin (or Time Period)
 - Original Platform or Context
 - Flag with * if Outstanding Contribution
 - Brief Description (Abstract of Narrative Description)
 - Researcher (who prepared this Entry)
 - Inventor/Team Leader for the Entry
 - Related Topics and Entries (items influenced by or which influenced it)

Documenting Software History

May 15, 2007



24