Standard Apologia:

The attached is still basically a draft, meaning
it's not as polished as I'd like and some of
the ideas are not as fully developed as I'd like.
However, it's close enough to what I want that
I thought you should see it now.

To: Bob Stein -

This is very well thought out -

Do it !

Inter Office Memo

To: Alan Kay

From: R. Stein

Subject: Whither the encyclopedia project?   Date: 10/31/82

It is clear now that we are months away from even
a handshske deal with EB, with the actual signing
of a contract perhaps six months to a year away.
Realistically it would probably take six months or
more just to convince Ray, regardless of EB. With
hindsight perhaps we would have done some things
differently - c'est la vie. The question now is
how to move ahead.

Given the situation I would suggest the following
strategy. On the one hand to proceed as much as
possible as if we had all the necessary go-aheads,
while on the other, doing the basic homework (business
plans etc.) which will convince Ray & Co. There
is a lot of gearing up we can do now that will put
us in good shape when the various deals are made
and the project approved.

I think working on two levels is necessary both for
morale purposes and to avoid losing momentum and
time.   The suggestions here are ambitious, but if
we plan well and choose our personnel carefully,
I think we can pull it off.

The remainder of this memo is loosely divided into
two sections. The first lays out some general principles
for carrying out work, while the second goes into
more specific suggestions.

General Princicples

1. Don't Commit Too Early. Aim High

    At present we have only the vaguest notion of
    what the Intelligent Encyclopedia (IE) will actually
    look like. It's too early for anything too fine-
    grained. The biggest danger is to proceed on
    the basis of a conceptual model which merely
    transports the form and content of old media
    (books, movies, records, newspapers etc.) to
    the new technologies. This kind of recapitulation
    is inevitable at this stage, but the IE has to
    go further. We are at an early point in the
    learning curve and much work needs to be done, not
    only basic research but major theoretical work as
    well. For example, as often as the phrase "interactive
    learning" is bandied about we can hardly glimpse a
    faint outline of its meaning. We need a high level
    synthesis of what is known about learning and
    the potential represented by computers. Failure
    to base our plans for the IE on such work will
    result in a far too conservative model.

    We are going to have to tap directly some of
    the most original and far-seeing minds around,
    as well as stretch our own vision as far as possible
    (continuously checking our assumptions for stodginess
    and vacuous trendiness). Several of the specific
    suggestions below address this issue in various ways.

2. Technology Must Flow From Purpose - Not Vice Versa

    Our goal is an intelligent encyclopedia. All the
    research in developing the technology, whether
    basic system architecture or methods of knowledge
    representation, should be based on and flow from
    our understanding of this goal. However, understanding
    the goal on more than a superficial level requires
    going into particulars. (For example take history
    and physics. What do we need in the way of a
    knowledge representation system that can successfully
    accomodate both fields.) As much as possible
    key personnel should be immersed in the subject
    matter itself. In general it won't do for the
    major system designers to know a lot about computer
    architecture but little about Waterloo and quantum
    mechanics.

To this end I suggest we make a liberal arts education
an important component of ongoing work. We should
be offering seminars, colloquia, courses, etc. on
the widest imagineable range of topics. Someone
should be hired to develop this in close consultation
with C. Van Doren and others.

3. A Brainstorming Environment

In keeping with #1 and 2 above, we want to create
the richest possible environment for mind-stretching;
we want 'aha' experiences regularly, not only in
special brainstorming sessions. (As fission is
to fusion, Pajaro Dunes is to a brainstorming environment.)
The key to this is in large part well-conceived
and varied input: film festivals, colloquia, guests
from the outside, artists in residence, field trips,
etc. Fight day in day out, year in year out tedium.
Keep people on their intellectual toes. (Wouldn't
it be great to have historians and anthropologists
take a sabbatical leave at Atari Research, combining
their interests with ours.

4. Artist/Scientist - Scientist/Artist

This project needs both artists and scientists.
Unfortunately our present culture tends to promote
the idea that there is some brick wall separating
the two. More unfortunately a lot of people grow
up a product of that culture with the separation
imprinted at a pretty deep level. As much as possible
we should strive to equip the artists and scientists
with an understanding of each other's vocabularly
and basic perspective so that they can communicate
and collaborate in a productive manner. A modern
version of a renaissance person would be a good
model to emulate.

The excitement and interest evoked by B. Laurel's
recent pong presentation on the application of
Aristotle's Poetics to software design is a good
example of the value of working toward this sort
of synthesis.

5. Don't Try To Do Everything at Atari - Rely on People
and Groups of People Who are Already Up To Speed

First of all the scope of the work is so vast that
there is no way we could hire everyone we need,

at least not people good enough. More important
however is the idea that by relying on other groups
we get diversity of thinking. Also, following this
strategy allows the project to function as a magnet
which attracts people to the Atari orbit, permitting
us to derive strength from the ongoing work of a
much wider base. It's also a structural hedge against
insularity and parochialism.

Relatively Specific Suggestions

1. The Long and Short of It

    Assuming we go along with the suggestion to
    to postpone actual development of an online
    encyclopedia (see attached 10/29/82 memo), the
    competition between long and short term priorities
    should be manageable at least for the next six
    months or so. In light of this I suggest that
    we develop both the short and long term aspects
    under the same roof.

    Specifically I suggest we invest the ad hoc/informal
    encyclopedia committee (Weyer, Laurel, Hooper,
    Hon, Taylor, Stein, Dunion, Brennan) or a reasonable
    facsimile with the responsibility of midwifing
    the project's early development. The group
    would function as a forum in which to set an
    initial course, identify important research
    areas, sift through the 100's of ideas for research
    projects to find the handful of great ones, etc.

2. Online Encyclopedia

    See attached memo (October 29, 1982)

3. Communications, huh?

    Hire a couple of sharp telecommunications experts
    to chart out the next 15 to 20 years for us.
    What are possible scenarios? Can any action by
    Atari or Warner affect the likelihood of any given
    scenario? How could Atari leverage its technological
    and market strengths in the age of online distribution?
    Implications of all of the above for the encyclopedia
    project?

4. Microcomputer Software and Videodiscs

    I assume that at some point we will have a go-ahead
    to do at least a small number of microcomputer programs
    and videodiscs - as products - related to the encyclopedia
    project. There is a lot of preparatory work that
    can go on now. We should sharpen formulation of
    goals, identify subject areas, solicit specific
    ideas and begin to choose groups to develop them.
    Brenda very much wants to tackle the microcomputer
    software. We should hire someone to head up the
    videodisc aspect.

5. Databases - Treasure Hunting

    The IE can be expected to provide a gateway to other
    databases (eg. The New York Times, Dow Jones, etc.).
    In many cases we would probably not be able to get
    these databases on an exclusive basis. There are
    still a large number of databases, most of them
    still in print form only, which we could probably
    buy exclusive rights to. I'm thinking of such periodicals
    as the Harvard Medical School Newsletter (written
    for the layperson), Archaeology, American Heritage,
    Audobon, The Whole Earth Catalog etc.

    We should hire someone to survey all available "databases,"
    recommend the winners and advise us on such things
    as who owns/controls them .... This is definitely
    something that needs to be done NOW, before all
    the opportunities get gotten by someone else. I
    like your idea of having Stuart Brand advise on
    this - if not actually do the work.

6. Images - More Treasure Hunting

    There are unfortunately a finite number of great
    images - still and motion. Short of working out
    deals with Time-Life or National Geographic (not
    impossible) we are going to have one hell of a job
    finding affordable images for the IE and all its
    less talented predecessors. Even if we did work
    out a deal with Time-Life or NGS, those collections
    are not all inclusive and we would still have the
    problem of motion pictures, for which there are
    not any equivalent collection in terms of comprehensiveness
    and excellence. Suggest we hire someone to start
    an extensive effort in this area. Bargains are
    going to get harder and harder to find.

7. Going Public

Sometime in the not too far distant future we are
going to be able to announce publicly the existence
of the encyclopedia project at Atari. If carefully
conceived and carried out we can use the announcements
to attract and orient people around the project.
A few specific suggestions.

A whole strategy should be prepared in terms of
conferences to present papers at, journals and magazines
to submit articles to etc.

A major piece by A. Kay and C. Van Doren should
be written on the theme of the leap in mankind's
abilities that computers will enable and the role
of the encyclopedia project within it. The combination
of A. Kay and C. Van Doren is quite unique : and
by itself makes a statement about the synthesis
we are working toward.

Glen Keane's pictures have had an overwhelming effect
on many of the people we've shown them to. On more
than one occasion people have fondled them and looked
at them over and over again. It is highly unusual
to see this sort of dream represented so artfully.
I suggest that we get Glen to fix up the pictures
that need fixing and then prepare to publish them.

8. Conference

One of the ways to engage leading theorists and
researchers in the project is a small working conference,
the sort that is so seminal and rich in new ideas
that it is referred to for years, "As Soandso said
at the Yadayada Conference." I see us inviting about
25 people representing the full spectrum of intellectual
endeavor. Each participant would present an original
paper on a relevant topic (the charter on this would
have to be well thought out). Taking place over
a week or more there should be ample time for lively
discussion and an attempt at synthesis where possible.
While most of the participants should be recognized
world-class figures a number of (younger) people
should be invited at least as observers - to ask
questions and inject an irreverent element. (Such
a conference should yield at least a book and an
edited video documentary which can be used to broaden
the range of its influence, on the project and in
general.)

Presumably the participants or a subset could be
constituted as an ongoing advisory committee.

9.   The Atari Lectures

Related to the conference idea is the possibility of
endowing an annual lecture series at a university.
For example Columbia could present the Atari Lectures
on the Expansion of the Human Intellect (concentrating
on but not limited to the role of technology. Presentations
could either represent an attempt at synthesis
(Marvin Minsky on the First 25 years of AI) or somewhat
more exploratory (So & So on   "Toward a Concept
of Interactive Art").   It seems possible that
the process of establishing the lecture series could
begin to lay groundwork for the Atari Institute.

An interesting variation on the above (to do in
addition, not instead of) would be to offer a prize
for the most original paper by an undergraduate/graduate
on the same general theme as above.

10.   Question Journals

The idea here is to get various people in various
institutions and venues to keep a running log of
all the questions that occur to them or that are
asked of them over a given period. Teachers, students,
families, doctors, librarians, museum guides, people
on a nature walk, secretaries, businessmen etc.
The log would include a list of questions, the circumstances
under which the questions arose and whether and
how it was answered. My hunch is that there is a
wealth of insight to be gained from this - the range
of questions, the study of current methods of answer
seeking, the depths to which people chase original
and subsidiary questions. All this and more will
help sharpen our understanding of what is needed.

People could be lent tape recorders to record the
information and be given an Atari 400 or equivalent
upon completion. I suggest we start out with a
couple of people and see if it's practical and/or
wortwhile.

11.   Business Plans, Evidently a Sine Qua Non

Let's hire a congenial MBA as soon as possible.
The person's charter should be to start looking
into development of a business plan for the IE.
Since such a plan will obviously be a long time
in development, as a warmup they can work up a business
plan for the microcomputer software and videodiscs
so that we can pass them on to the operating divisions
when appropriate.

12. A Study of Learning Environments

   Let's find a few bright graduate students, with keen eyes
   and the ability to write who would be interested
   in taking as their thesis topic the study and comparison
   of various learning environments, particularly some of
   the informal variety such as the Exploratorium and
   the Capital Children's Museum. We want to look
   at how both kids and adults function in these environments
   - what works, what doesn't. We especially want
   to understand the question of motivation, shared
   learning etc. A lot of important generalizeable
   lessons just waiting to be synthesized. It would
   be particularly interesting if we could get graduate
   students from different disciplines - eg. anthropology
   and cognitive science.

13. What's In a Name?

   The word 'encyclopedia' does not cut it. Too many
   years of furniture duty and dusty tome connotation
   have taken their toll. In fact, I would guess
   there are no available words or combination of
   words in English which can convey the richness
   of the IE concept. We need to come up with a
   word which implies the ultimate fact reference
   tool (Hitchiker's Guide), learning machine and
   adventure game. We may have to invent the word
   and win people to its meaning and use over time.
    One good thing about searching for a name is
   that it tends to focus and sharpen your thinking
   about what you are doing.