INTERVIEW WITH STANLEY OLSEN, 8/20/90

Interviewer: Jamie Pearson

SO: I was born in Stratford, Connecticut. I went to
Stratford High School and had an awkward beginning in
college. I left the University of Connecticut during the
Korean War and they decided they wanted me in the Army.
I probably learned more technology in the Army than I did
in any university. When I had gotten out of the Army,
Ken asked me to consider going to MIT and working there.
So I went to MIT, and I finished up at night school at
Northeastern University. I became a research engineer at
MIT before I got my degree. I finished up at
Northeastern. The University of Connecticut didn't know
anything about engineering. I figured that out in the
Army, when I had a few years of engineering and I found
out they didn't know anything about engineering. I
figured the University of Connecticut had something to do
with it.

INT: So you were at MIT in 19....?

SO: This would have been 1953.

INT: Were you involved in the Whirlwind project and that
activity?

SO: No, when I came Whirlwind was pretty well settled down and they had just started MTC, Memory Test Computer. I became involved in that. First I was in charge of the maintenance, which meant many telephone calls in the middle of the night. It was a serial machine and we made a parallel machine out of it. So I got deeply involved in the design and the building of that. The control of MTC was probably one of the more interesting experiences as far as engineering goes.

I was working at Lincoln Lab almost from the beginning at MIT.

INT: What was that environment like?

SO: That's an interesting question. That phenomenon is a little hard to put your finger on, but it's an important phenomenon. It's kind of like Admiral Rickover's group that built the atomic submarine, the people in Houston working on the space program. Where you get a relatively small group of people working on something extremely challenging, there's a tremendous feeling of personal enhancement in doing that. That's the feeling we had at MIT. We were building computers for air defense, [a] totally different [application] than any computers had been used for. Up until then, and long after then, IBM, UNIVAC and some of the universities,

Harvard, and the University of Illinois, worked only on computers for arithmetic. Their narrow vision was only as counting machines, to the point where Howard Aiken said something like the whole world only needs two computers. It's not that he was wrong, it's that the view was so narrow. MTC had proven itself as a memory test computer, and then it went on to be used as a signal generator, [which had] never been done before with computers. What it was really doing was interacting with an event, the event being an aerial warfare situation. So that's the feeling we got; this was the type of atmosphere we worked under. This is the concept of computers that we were developing, and this is what we took to Digital Equipment with us. Two very basic things: the interactive use of computers and in the broadest sense, a group feeling. Do you want to know anything more about MIT?

INT: No, that answers that question. You characterized it well. The batch world was the thing at the time.

SO: It was the only thing.

When we first built the first PDP-1, one of the first things we did was to give a PDP-1 to MIT with the condition that undergraduates had to have free access to hands-on or interactive use of that computer. We didn't

think of the word interactive at that time. We didn't
even think of the words at that time. Somebody labelled
it as a "mini-computer," which is most meaningless name
ever. "Mini" means size and it had nothing to do with
size. It was the use that was so important.

INT: The best description that I saw was in an early
DECUS paper which called it the PDP-1 a "thin-skinned
computer" because of its interactive approachability.

SO: The most important thing is nearly every computer
today is interactive. Nearly every computer today comes
out of the roots of what we started in Digital Equipment.
About 1970 I was privileged to start a new group
called Business Products. We started it from zero, and we
started an interactive business computer. Nothing had
been done before. Nothing. It was always batch
processing. We started with a cathode ray tube and
interactive business systems. That's what they're all
about today, but we started it then. Within two or three
years, we were $700 million dollars in business from
zero. In that time it was just amazing, the acceptance
and the growth. That's really what PC's are all about.
We've kind of fought the word PC because people were
toying with the idea of home computers at that time,
which didn't have much meaning, and so we didn't pick up
on the word "personal computer" either. But "personal

computer" really means a single person within an
organization will solely interact with a computer. So we
started the whole thing. Our first PDP-1 had a cathode
ray tube which it interacted with, too. But in the
business world, we started the first ones long before IBM
or before anything in what is now called Silicon Valley
ever got started.

INT: We got ahead of ourselves. I wanted to hear from
you a little bit about getting Digital started and your
involvement in that. What your first roles were? What
kind of communications did Ken and Harlan have with you
around the goals of the business when it first got
underway? How did you choose Maynard? What was the
first day at work was like? And so on.

SO: Well, at the time, I was being courted by Sylvania
and I think Sylvania was the most important, and several
others I was thinking about, because they were now
starting to think about going into the computer business.
I think Sylvania was mainly military contracts. I
mentioned it to Ken and he said, "No, no, wait a minute,
we're going to go into business." It's like when I got
into the Army, I had opportunities financially much
greater than going to Lincoln Lab, but he talked me into
going to Lincoln Lab which was one of the best moves
ever. I probably could have done financially better at

the moment at Sylvania -- because we didn't pay ourselves
very much. We had a vision of the product, we had a
vision of the market. We had no visions of success,
financial success.

INT: Personally.

SO: No. We had a mountain to climb and that was it. We
never thought about what happened when you get to the top
of the mountain.

INT: Did you feel a sense of personal responsibility?
You had to make good on your funding? Did that drive it?

SO: No, that didn't drive it. That was basic. That's
an important point also; that we had a tremendous respect
for our financing source, which was American Research and
Development Corporation, which also represented a large
number of stockholders. It was very important that we
had a tremendous respect for our investors. Something
that's quite absent [today], and a reason why so many
businesses have failed and a reason why a great
disenchantment between financial people and technology
start-ups [exists]. That was one of the key reasons for
success, this respect we had for the investor. People
have criticized all along, nearly from the beginning that
we gave too much of the company away for too little

amount of money. You have to think of the times. Money

was tight. They showed a tremendous amount of respect

for us, and we showed respect for them.

INT: Was it always clear to you that Ken wanted to start

his own business? That he wanted to be an entrepreneur

rather than go and work for someone who was already in

business, or stay at the lab?

SO: Always. Always. No, he just always wanted to do

something significant, that's all. Whether it was in

business, whatever he...

INT: So when he said we're going to start this business,

it wasn't a surprise to you?

SO: No, because whatever he tackled he did it in a

extremely intense way. He decided he was going to learn

about business, and he just went about it and learned

everything there was to learn, and put that together with

his vision, not only the vision of the product, but how a

business should be run.

Why the Mill? It was cheap. We had no illusions of

building fancy offices and paying ourselves well, or any

of the other... We just wanted to show the world what

could be done with computers. I can't remember now

whether it was 40 cents a foot or 50 cents a foot per year heated. That's the reason we went there. It was cheap, effective, useable. It solved all our basic needs.

INT: Maynard was a rather depressed place then.

SO: That's right. That's why it was cheap.

INT: Over time it's very clear that Digital's breathed a lot of life into Maynard and the surrounding area. But at the time you must have been seen as an upstart that might offer some opportunity to...?

SO: No. They saw us as three wild guys doing something crazy. You know, the first few years nobody could pronounce Digital. Nobody knew what Digital meant. This was long before Digital watches were in...

INT: Ted Johnson said that on his first sales call people thought he was selling heart medicine.

SO: That's right. "Digitalis" is the only word that came close. So nobody knew what the word Digital meant at that time. They probably thought we were crazy. Bradley, of Bradley Dewey Company, started what then became Sun Chemical, or part of Sun Chemical. He had

retired from Bradley Dewey and he had had this concept of
bro-molding, which of course we use everyday today in
plastic milk bottles and everything, but at that time it
was new. He started a bro-molding in the Mill and Revlon
would ship in their products and he would package them,
and so they were much larger. That's what people were
looking forward to at the time as being the
manufacturers. From the beginning we were just a few
upstarts.

INT: What were the roles? Who did what? Legend has it
that you all did everything.

SO: I guess I had the title of Manufacturing manager,
Ken was president and engineering manager, and Harlan
Anderson took care of the financial and the selling. But
then we went and changed around, too. We figured out
soon that we didn't have a personnel manager, and most of
the people were hired for manufacturing, so I was
personnel manager. I was the lowest on the totem pole,
so I had to clean the men's room and the ladies' room.
We all built the partitions, and we all did whatever
construction work had to be done we would do. I don't
know where Ken designed the circuits, whether it was
driving in the car or where, but he designed the
circuits, and he'd go home at night and do the
photography for the printed circuitry. He'd come in in

the morning, and he had the transparencies ready for me.
Then I would take the transparencies and make the printed
circuits that day and assemble the boards. So, within a
24-hour turnaround we would have a complete circuit done.
I think I just read in the paper this morning that
finally there's a place in Silicon Valley that will turn
around a circuit in a day. These were an awful lot
simpler than what we talk about today, but that's the way
we did it.

We really didn't have enough money in the beginning to
build computers. There was still a great need for
modules for test equipment and that's what we started to
sell. We had a built-in market. Back at Lincoln Lab we
knew there was a need, and the Jet Propulsion Lab in
California, then Honeywell, which was Datamatic at the
time, near Boston. So those were our built-in customers
to begin with. Then we sold to schools. Not long after,
I can't remember the dates, I took over then as sales
manager, and I went around to a lot of different schools,
and Navy training devices in Long Island. I'd go out to
the University of Denver, and they were doing some
development.

INT: What was the response to the products that you had?

SO: Well, for those that understood it, it was

tremendous. The biggest problem was to teach people Digital logic. You had to tell them what it was, first, then they had to understand what it was, and then they had to understand how to use it. So I'd go around giving seminars on digital logic and then make the sale. But we came up with the bright idea of having Dick Best, who was then the chief engineer, write a book on digital logic. That wiped me out, because I had nothing more to teach because the book told it all. Digital logic is really pretty simple, but nobody knew about it, so I came out as a hero in giving these seminars. But Dick came out with the book and that wiped me right out of business.

INT: Was that the beginning of this handbook business that's done so well?

SO: Yes, that was kind of the original. But then we had the concept of putting a catalog and a handbook together. Then our advertising people wanted to do a real slick book that cost something well over a dollar, or probably three dollars, I can't remember exactly. I said, "Well, that costs too much money." "Then why don't you limit the number you print?" "No, that's not the idea!" So I went down to the paperback bookstore and I came back with three paperbacks that were selling for something like 25 or 50 cents a piece then, and said, "Here's what we really want." They said, "No, we don't want anything to

do with that." I said, "This is what we're going to do."
I think it cost 17 cents a piece to print our catalog and
logic handbook together. We produced about 60,000 of
them. We would go to the IEEE Show, which was the show of
the year for us, and we'd hand some 30 or 40,000 out at
one show. The secret was, when somebody was walking down
the aisle, you stick it in their stomach, and as they'd
double over they'd have the book! When they first saw
it, our engineering people rolled over with laughter
because they'd never seen anything, [as different from]
real slick stuff. They thought this is ridiculous
printing something like a paperback. So I'd have to go
out and sell our sales people on the idea of the book.
I used two examples. I'd take a dollar bill and I'd
say to a librarian, "You can take a dollar bill and tear
it in half and they won't flinch. But if you took a
dollar paperback and tore it in half it would blow their
mind." So we are bibliophiles.

INT: There's something sort of sacred about a book that
you don't throw it away.

SO: You can't throw it away. Ask everybody, how many
people have their textbooks from college? They still
have them! Then I said, "The binding is the most
important thing in the book, because an 8 1/2 by 11 piece
of literature can go in your file cabinet, but you can't

file a book. It has to go on a bookshelf. So the thing
you see everyday is the binding on the book." Then
second of all, the cover. The cover has to look like
it's something of value. So you do a very nice color
picture. Many years later, and probably a million books
later, people called us marketing geniuses for doing it.
But at that time it seemed like a very practical thing to
do.

We had settled predecessors before us, you see, people in
sales like to be complicated. They like to come up and
hear seminars. When they came out with the book, I was
hurt deeply, because then I was no longer an expert.
Actually, I loved it, but the people in selling like to
have variable prices. They like to come out the hero,
they like to work out the detail. We said no, life has
got to be a lot simpler than that. The product is
complicated enough, everything else has to be simple.
The organization has to be simple, we have to understand
it, people have to understand their role. So when we
present our product it has to be very simple: a Sears
Roebuck Catalog. That's the business we're in.
Everybody has the same prices. It's published in a
catalog. The catalog had the prices in addition to the
tutorial information. The tutorial information gave it a
tremendous amount of value. But the simplicity of having
the prices there so people could make a decision, and

read the tutorial information and understand it, and figure out exactly what product they need and know the price exactly, we didn't need the big mastermind sales people. Order by mail. Which happens to be a phenomenon today.

INT: You were the personnel manager, in the early days. What did you look for in hiring people, for Digital?

SO: People with fire. I tried to make sure that three people interviewed everybody and that all three people agreed. I leaned heavily on references. But what to look for in people? The desire to be a part of something significant. Make sure that they didn't want to retire.

One of our first engineers was Barbara Stevenson. We have to put that back in the context of the early sixties when women had a problem getting hired, and as an engineer, it was unthinkable. We didn't think about that. From the very beginning we thought about people's capability and drive as the most important. We didn't hire in the reactive mode, but more proactive.

INT: Did you have lots of applicants in those days? I'm trying to get a sense of the how the company was accepted.

SO: It depended on on the the type of job. You see, when it came to manufacturing people, you could look around to which companies were laying off, or you could look off in spotty areas, or if there were just none available [you could] invent something called the mother shift. I can recall we needed technicians and they weren't out on the street. So I went to Wentworth Institute, and interviewed a bunch of graduating students, and I hired Jack Smith, and Bob Reed. I think Bob Reed is still with us.

INT: Yes, he is.

SO: And of course Jack has done fairly well! [Reference is to Jack Smith, Senior VP of Digital] So I think I did a pretty good qualification at that time. But in a sense though, it's not just hiring right, a lot of it has to do with cultural development. You have to provide the right atmosphere, the right vibes to for people to develop because, I don't know to explain it, it's got to do with the culture of people doing something significant. Like the space program, where people will put a tremendous amount of effort into producing and learning.

INT: How did you do that? How did you provide that environment?

SO: I would guess because we all worked hard ourselves.
There were no ivory towers. We were there all the time,
and you know it was Ken and Stan and Harlan. Everybody
knew everybody was human and working hard. That's
important.

I've been reading Tom Peter's book <u>Thriving on Chaos.</u> If
you look at it carefully and maybe reject ten or twenty
percent of it, it looks like a history of Digital. It's
a forecast of the nineties, but it's a history of
Digital. Now, you think about that [SHOWS PIECE OF PAPER
FROM PETER'S TRAINING PROGRAM]. There's the secrets all
there, okay. [READING LIST] "Niche markets." We started
off with the training modules. "Create flat
organizations." I said we all get together, everybody,
not multilevels of organization. "Be a quality fanatic."

INT: That's true.

SO: We had the desire. We had to be taught by some of
our customers. [Peters] doesn't list it here, but you've
got to be constantly in contact with your customers. "Be
fast, flexible and time competitive." We were
profitable. We started the first of September; we were
shipping by the end of November and I think we were
profitable then. This was unheard of. "Redefine every
product by a service added." That's mostly in the book.

"Be an internationalist." That came on later, in 1963. I
went over to Germany and started up the European
operation in Munich. Did it in one week !

INT: By that time you were a pro at building partitions.
Six years after founding the company, that's pretty fast
to go international. The offices started up quite
quickly after the Munich one.

SO: I also went over to Japan that year and got us
started in the memory test business there. [LOOKING AT
PETERS' LIST] "Be a technology pioneer." That's what
everybody talks about. "Create smaller units." It was
1965, we created the product line management which then
we went on to marketing management. I disagree with the
inventing of the single functional unit which now is
going back to more more to product line management again
today. "Add value through people." Digital is a very
people company, but the function of the people is to add
value to the product. We're not just there to be nice to
people; without without a product, without something to
sell, without a service to sell, we can no longer provide
for the people. "Adopt an ethic of constant
improvement." That's something that has been there, but
it's a little more sporadic. Every six months, Ken would
come down and say, "This the way we're gonna do it."
Everybody would argue and disagree, and say, "You can't

change that." He would change it, and it was in this [state of] constant improvement.

A company is a process. Institutionalizing an organization doesn't do anything. When it comes to organizations, the biggest organization in trouble is the government, because they've institutionalized their organization to the point where it's meaningless, so most people are finally going to figure out that the government's the one in the biggest trouble. To survive, companies have to have constant improvement, constant change. Change with the market, change with the economy, change with everything that's going on. That's one of the one of the important things that Digital's had, the ability to change.

We never took a such a strong stand against unions just because we didn't like unions or we didn't want people to be represented. Unions create an inflexibility. That's why we have fought unions. They stifle and you go out of business. The other hidden advantage of starting in Maynard was the fact that, as you say, Maynard was a depressed area. It was depressed because the union drove them out of business! Most people understood it so we didn't have a problem with the union coming in to try to put us out of business. In reality, when you looked at it, that's their sole intent: to put you out of business.

They don't understand that. What's happening now with the federal government, the state government, and the local governments is their sole intent is to put you out of business. They view business as their competitor. In addition to a few other things like the legal business trying to stifle us with product liability and other things, I think the government is the biggest problem we have to face in the next few years. If it ever had any usefulness, it has outgrown it.

That's kind of a long answer to your your question, but I've just been reflecting on this. It's amazing that his forecast for how to do business in the nineties, is the way we did business in the sixties. If anybody asks why we were different or successful, those are basically the reasons, but nobody in Digital from Ken on down liked to admit that anybody else could be that perceptive.

INT: Can you review the development of the computers produced after the modules business got going? Of some of the competition at the time?

SO: There was a company at that time that had all the potential of effectively competing with us, if even maybe doing a better job but they lost sight of it completely, it was Control Data. They ended up with the 160G, a real failure, because it was aimed at the military which was

the wrong direction to go. Then they went out to build bigger and bigger computers.

We built the PDP-1, and then designed the PDP-2 and PDP-3. One of the best decisions was not to build them. We did build the PDP-3 as the PDP-6. With the PDP-4 we were going to build a $30,000 computer and when we got finished, it really cost more than we thought and we marketed it in the mid sixties. It was somewhat successful but it was still a little higher priced for its capability. It again was not a running success. It resurfaced later as the PDP-7 and was much more successful.

The PDP-5 was our first shot at purely interactive computer. Gordon [Bell] scratched it out on a plane from Chalk River [Ontario, where Digital had a PDP-1 installed.] Gordon doesn't think simply and that's probably true of a lot of people in the company. Ken doesn't think simply, I don't think simply. Whenever I come up with a solution, it's a solution for many different problems all at the same time. When Gordon scratched it out in the airplane he'd been talking to several customers over the past months and it was kind of weighing on his mind. Then the visit to Chalk River triggered it off and he designed on the way back.

INT: That was the computer that became the 8?

SO: Right, but it came out as the PDP-5 first. It was a
full rack computer and the architecture is the same as
the -8 but the -8 had taken many more of the developments
to it. We developed the -6, which was really the PDP-3,
36-bit machine, and the -7 which was an enhancement of
the -4, and then we developed the -8. The -8 was done
not in engineering, but in the sales department, because
we were the only ones who had the time and the ability at
that time. Everyone else was too busy.

INT: So you talked to your customers, you talked to
engineering?

SO: Yes. Ted Levitt was the top man at Harvard Business
School in marketing. Does that sound right? A few years
later we decided we were going to learn something about
marketing so we called him in and he went around and
interviewed everybody and he was going to give his
presentation about how we should market. He essentially
said, "You are marketing. Your marketing is you feel the
warm armpits of the customers." Coming from Harvard
Business School that's a bit crude, but that's exactly
what it is: you feel the warm armpits of the customers.
Again, it doesn't say it on this list [POINTING TO
PETER'S LIST] but what I used to tell people was if we

manufactured soap and then we went through multi levels
of distribution and it ended up in a supermarket and a
customer got it, there's no way we're ever going to find
out whether they like it or dislike it. You just can't
find out. You go to a market research company and have
them come out and figure out what's really going on.
Why go through all that? Why not just stay in touch with
your customers? We have the ability to. We have a
non-commissioned sales force, which is the best marketing
feedback we can get. Listen to them constantly, go out
and talk to them. I think Ken travels more than any
other CEO, COO. He's in touch with the customers all the
time. He's in touch with the sales department. He talks
to sales people. He knows nearly every sales person.
It's not that he's sales minded; that's his feedback of
market information. In general all of us did that.
We've been known as a marketing oriented company.

INT: Was that part of the reason that DECUS [Digital
Equipment Computer Users Society] was formed?

SO: Absolutely. No question about it. When we started
DECUS, a lot of people said we were crazy, don't ever do
that, it's a disaster because the customers will pound on
you, they'll drive you out of business, customers are
bad. We decided to risk it, to risk the negative to find
out what is negative and what is positive.

[END OF TAPE 1]

It's the best thing that can happen to you, being picked
upon [by your customers]. Let me give you an example.
Just a year ago, I had lost touch with my customers and
they were up in arms, and not about any physical things,
they were all emotional things because we hadn't talked
to them. So I had a meeting with all of them and did I
take a beating. I had one fellow there, a Mexican guy,
Montez Dioca(?) and he accused me of giving him an ulcer.
It was tough! Last week I had a birthday party and
Montez Dioca showed up and he had this caricature drawn
of me from a famous Mexican artist that he was so proud
to present to me. I mean, the best friend I've got in the
world today is Montez Dioca. But only because we got
back in touch with the customer. That's why we had
DECUS, that's why we make sure the salesmen are in touch,
that we're in touch with the salesmen. We slip up,
everybody slips up. I don't know how it's done today,
but that was a key element. If a customer says I want a
33-bit computer, we don't just rush off and do it. You
take all the information.

I have a few restaurants and I keep studying all the
feedback information. You've got to know what's in the
mind of your customer or you'll lose touch. Nobody's
bright enough to design something perfect for a customer
without talking to them. We still don't do it like,
who's the Harvard economist? John Kenneth Galbraith.

He thinks it's terrible that we build standard products.
He believes you've got to build a special product for
everybody. Of course he's not in touch with the economy
for an economist, anyway. You keep taking the
information and then you do what's right, you do what
fits in with your vision of what you can do and you try
not to do the things that are impossible, too costly.

INT: You were at Digital during some periods of
incredible growth. How did you manage to maintain that
contact, or did you manage to maintain that customer
contact while the company was taking off and more
products were being added, more customers, more
employees? How did you stay on top of it?

SO: You begin through DECUS, through customer visits,
and talking to the customers when they come to visit.
Customer visits were very important. You get out into
the field and you have the field people try to have you
visit some of the customers.

INT: If we get back to the PDP-8 for a minute, from a
history of technology perspective, that product put
Digital on the map. Did you sense that significance to
the industry?

SO: We never thought about the significance but we

thought about the use of a computer. That PDP-8 is what
Digital was all about. PDP-8 is what computers are all
about today. PDP-8 was a forerunner of all of them. I
mentioned PDP-4, we were going to design it as a $30,000
machine, and it came in the sixties. Then we got the
PDP-5, which was going to be a $30,000 machine. It came
out at $32,000 and that was a very significant move. Now
when we come to the PDP-8, we are going to build the
first computer under $30,000 and we're going to do
something the Japanese invented later called forward
pricing, but we really did it then. We're going to come
in at $18,000, unheard of, stupid, nobody in their right
mind would ever do it. But we know we can do it if we
sell them in large quantities and we're pretty convinced
we can sell them in large quantities. We know there's a
tremendous use of the machine once it gets out into the
hands of people, and we know it's the future of
computers. We really weren't sure we were going to sell
it, we weren't sure of its success, but we were very sure
of its ability to do what had to be done. So the price
was very significant. The interactive ability was very
significant, and the actual size had very little to do
with it. At that time miniskirts became popular in
England, so somebody labeled it a "minicomputer." The
size had nothing to do with it. They missed it
completely. They still call them minicomputers and
superminis and [CHUCKLING] and microcomputers. Size has

nothing to do with it. It has to do with the job it has
to do. Now they're talking about bigger and bigger
microcomputers replacing not only minis but even some of
the things mainframes are doing. So size hasn't got
anything to do with it; it's got to do with the
capability and how it's used. One of the biggest things
we had ever - Ken had ever, since he's the leading force
- done was in networking of computers, as opposed to big
mainframes. Now the next thing happening of course with
networking, of course, is file servers, which is
something we tried to do in the mid-seventies.

INT: I interrupted you when you were talking about the
-8 as what all future computers had been based on. Can
you elaborate a little bit more on that?

SO: The interactive ability, the personal computer
concept. It's personally used by individuals and it may
be networked or they may be offline with a floppy.

INT: The PDP-8 played an important part of Digital's OEM
business?

SO: We had some OEMs with as far back as the PDP-1. We
were always in the OEM business. After the laboratory
module we built system modules, and of course those were
strictly for OEMs, people who used them in products.

Then with the PDP-1, IT&T had used them. One of the
first uses was the spooling of telex messages from Europe
through Paris to this country. It was used by the State
Department. In addition to interactive, our computers
were online computers, and we did use the word "online"
as opposed to "batch" or "offline," because we built
faster, more reliable machines.

INT: You were responsible for the development of Digital
in the commercial market. Can you talk about the
decisions that led up to that? How you pushed that
through, where we were before then?

SO: It wasn't easy because a large number of people just
liked to extrapolate the past into the future rather than
follow some other visions into the future. Some of the
negative reactions were "Never compete with IBM." We
weren't competing with IBM, it was a total new approach
to business. But people didn't see that, didn't
understand that. How can people in business use such a
small computer? We were helped dramatically by some
software people. One of them was MCBA. The traditional
name is Bicars(?) but we labeled it. So we were
delivering a package, which we really hadn't done before.
We delivered hardware, but people developed their own
software. We delivered compilers and assemblers.

INT: But then you were delivering computers to people who knew what they were getting, they'd want something for specific applications, say a laboratory environment and they knew how to program it.

SO: Yes. But this was just somebody who really knew nothing about computers. Just like people today go out and buy a PC or a Macintosh and then they get software from somebody else and they do their job. So we were not only introducing interactive computers to the business but we were introducing to Digital the first fully packaged computer. It wasn't easy. Besides the PDP-8, we introduced PDP-15s, and as the Business Product Group we didn't do the PDP-10, that was done was done with the Large Computer Group.

INT: What kind of commercial markets were you looking at?

SO: Anybody who would buy it! Insurance companies. Again, it was hard to get the concept across that individuals within an organization could have their own computer on their own desk. That was a bit difficult to get across. Now, you hardly go into a company now where people don't have them.

INT: I want to talk a little bit about the corporate structure at Digital and matrix management.

SO: Man cannot serve two masters you mean? [BOTH
CHUCKLING]

INT: Something like that. How were the problems with
the structure at Digital handled? Further, how do you
make decisions in that kind of environment, who has the
overall responsibility?

SO: The decisions for new products always came to the
Operations Committee via the product line manager. The
clearest example, of course, is like an accountant who
has responsibility for the information to the product
line manager, and responsibility for his professionalism
capability within the field to the financial vice
president. This is very difficult to explain. In
principle, what we strove for was loyalty to the company
as opposed to loyalty to an individual. This is just so
important. Many people understood it, some didn't.
Particularly when it comes to accounting: the loyalty's
got to be to the company. An accountant has to point out
the difficulties and not cover up difficulties. In so
many large functional organizations, different parts
cover up what's going on, and their job is to point it
out. If they're only responsible to one person, then
they're not going to turn up the bad news about that one
person. But if they have dual responsibility, it's clear

their overall responsibility is to the corporation. A
lot of it's got to do with loyalty. I think we pushed it
very hard: that it's got to be loyalty to the company and
the success of the company and the overall large number
of people in the company as opposed to a single loyalty
to a person. The loyalty issue is another good reason
for dual management.

INT: Would you say that those who have been very
successful at Digital have understood that and those who
haven't have left?

SO: A corporation is successful only if it has a
corporate vision. The corporate vision is Ken's vision,
that's it, okay? If you're going to fight that, you
might as well leave, because you can't have two visions.
You can have multiple levels of visions or there's total
confusion. The unanimity is not because it's demanded of
unanimity, but it comes out of this loyalty to the
corporation and a corporate vision. If Ken's a strong
manager, it's forcing his vision, and there's nothing
wrong with that. As a matter of fact, that's the reason
for success. [Bad things in] corporations are kind of
like gophers, you push them down in a hole but they pop
out someplace else. You can't just push the bad things
down, everything has to work together. The fact that
there was a strong corporate vision, and there was a

loyalty to that vision, is one of the major reasons for success. If in reality the vision is the strategy, it never really changed, it's the tactics that change. If you've got a strategy, then your tactics can change according to what's happening in the marketplace, what's happening with competition, what's happening with the economy, what's happening with governmental changes. The vision is the same, so it's like a strategy but you're continually changing your tactics. So people get a little bit confused when they say, "Hey Ken, you're going in the opposite direction." No, no, he's just changing the tactics, the strategy is still the same. I will admit that some people have gotten confused over time and I may have myself. But this whole strategy, I think, is almost as true today as it was from the beginning.

INT: Do you think that's unique to Digital? That Ken has the vision, the strategy, and that it's communicate effectively through 100,000 people?

SO: Yes. That's why there's a great deal of worry about what happens after Ken, because he has built up people and an organization to carry out that vision. If it loses its effectiveness, he just changes the tactics to make sure it keeps carrying out. He has never, and probably never will, explain it that clearly.

INT: What would you say his vision is or has been for the corporation? Often he says growth is not our goal.

SO: That's right.

INT: Quality, honesty.

SO: It's all in that list. [REFERENCE TO PETER'S LIST.] It's almost like Tom Peters went into Digital and wrote the book that you're trying to write...and called it something different. If you read Business Week about a week ago, they're saying that Ken's strategy -- and I haven't gotten this out of him, we don't talk much business -- is almost to go back to this again.

You had a question which I'm not sure I answered.

INT: You said there's some concern that Ken is leading this strategy and what's going to happen [to Digital] after he's out of there. Do you think that it's communicated well enough to propel itself now with the next tier?

SO: No--that's not a flat no-- the answer to your question is no because part of it is be fast, flexible and time competitive, and if you stick to today's interpretation of the vision and try to carry that for 20

or 30 years, it doesn't work. Fast, flexible and time competitive means change your tactics. So it has to be somebody who understands the vision and has to be able to respond to external changes. It's a tall order. It has to be somebody that understands what's going on. You look at 120,000 people and it's tough to understand what's going on. There probably would be 120,000 people who will tell you 120,000 different things. It has to someone with a tremendous intuitive feeling and a great appreciation for analytical information. It has to be somebody who is not necessarily an analyst, because you can get analysts to do all kinds of things. But you have to have an appreciation for analysis but be extremely intuitive.

INT: Those are two traits that are not often found in the same head.

SO: But that's what Ken is all about, see? He's extremely intuitive and he has a great appreciation for analysis. Intuitive people tend to reject analysis and go off in one direction. Analytical people tend to reject intuition because you can't analyze it, and so they go off in the other direction. A lot of companies fail when the accountants take over or the brilliant engineer takes over. It takes an unusual person with both of those abilities. I'm not sure what the answer is

but maybe you change the company to a more _____ company that it is. IBM has been able to go on in their way but they're a very different type of company. I don't know what's going to happen to Walmart when Sam Walton dies, either. That's an even greater potential because I think he's got cancer. Walmart is a highly intuitive organization, based on Sam Walton, and it's the same kind of problem. The other key here, of course, is what Peters says, flat organizations without many layers of management. I don't know how many layers of management there are in Digital today. But many layers of management come about by loyalty to an individual rather than loyalty to a company. I'm not sure you wanted me to reflect on the future as much as I am...

INT: No, it's fine. What I asked earlier before the tape was on was if you could look at a few examples of areas where Digital was very successful and why. Also I'm sure that you've thought about times when we weren't as successful and why. Was it right time and right place, dumb luck? Was it the right management team, the right vision? Is that a question that you can answer?

SO: It's a lot easier telling you about the successes. I think most successes can be pointed to as strong and motivated teams. I put together a team [CHUCKLES], this is one of the failures. PDP-X I think it was called. We

were going to build a 16-bit computer. We put together

the team, and one of the members of the team, sort of my

right hand man, was John Jones. He had the opportunity

to go out to some sort of a organizational session or

something psychological, and one of the things he learned

was if you got a group working together, make sure you

get them all together in the same room and you as a

manager obvserve what's going on. If they can't do it in

a room, they'll never do it outside the room. So we got

together once a week, and we met for a few hours and we'd

go over the design of this new 16-bit computer which was

going to be important for the company. We had a great

deal of difficulty. There was probably 8 or 10 people in

the group. There were two members that kept pulling in

the other direction **all of the time**. They just couldn't

agree, they kept pulling in the other direction. We

decided that there was really was something wrong. We

cancelled the project, and those two members went off and

started their own company. They did <u>exactly</u> what the rest

of the group tried to do, while they were trying to lead

us in the other direction, so that the thing they were

working on at night would succeed and we would go out

failing in the direction they tried to lead us into.

That was Data General, and it was Ed DeCastro and Henry

Burkhardt. It was John Jones' <u>brilliance</u>, his telling me

about it, that helped tremendously in stopping that

before it got too far. Ken knew about this, but he never

told anybody because I guess you get no where telling or complaining. Then we went on and we did the LSI-11 which was the next 16-bit computer. That was one of the failures, but in reality, it might have been wrong if we kept on doing it. I credit John Jones for being perceptive. It was kind of one of the failures you enjoy [CHUCKLES].

INT: Failure is learning.

SO: Yes. We were pretty cocky, also, because we were quite successful coming out of the box. We were a bit cocky. We sold one of our early machines to Foxboro Corporation. This was our first experience in industrial process control. Foxboro told us it wasn't going to work, the machine wasn't reliable enough. "No, no, we build the most reliable machine there is." They said "No it's not reliable enough for industrial process control." For some reason we gave into them and we listened to them and we let them dictate to us how to do it and that was another [example] of a potential dramatic failure turning into a big success. We learned a lot about reliability from Foxboro Company. Part of the problem was we thought we were really hot stuff in everything, and we were hot stuff in a small area.

INT: When you open the papers today or when you saw Ken

on the cover of <u>Fortune</u> a few years ago, you must have a real sense of pride and accomplishment. You described yourselves in 1957 as three crazy guys in a mill and you turned into the second largest computer manufacturer in the world. You were there for 20 odd years and were a part of that success.

SO: That's hard to explain. A company is a process. I I started off by saying that. At one point or the other, you're always in a process and you had better enjoy the process, because you meet so many people who live on past successes. I can think of different people: there's the fellow that still goes around wearing a green beret, people come here all the time trying to tell you about all the past successes. It's hard for me to hide, but there were so many people, there isn't anything that any of us could have done alone. You just feel great about being a part of the process, and the fact we enjoyed the process. I'm in the middle of processes now of my own, which I enjoy thoroughly. I try to do the best I can.

INT: Ken cautions the employees at times of success that you can't get complacent, you can't dwell on success. I think he's saying the same thing; that it's a big contiuum, a process, with great times and bad times.

SO: It's not over yet! [BOTH CHUCKLING]. I don't know

if you know what I'm doing.

INT: Real estate, right?

SO: Right, but I've built a golf course project, Black Diamond. Golf Digest magazine, which is kind of the magazine in the industry, named us the best new private golf course of 1988. For the past two years, Florida Golfer has named us the best golf course in all categories in the whole state of Florida. For 1,000 golf courses we're number one. So that feels terrific, because I'm in the process. But, you know, next week we could stumble. Or somebody could come along and build golf courses better. So I'm not living to live in that glory, I'm enjoying the process. I have a few restaurants and they go up and down by the week. Then the other real estate project I told you about, has gone up and down too; mostly successful, but it's a process and that's what I enjoy.

INT: Was your interest in development and real estate part of the reason why you got Digital started in New Hampshire? Can you talk a little bit about that, how that started?

SO: We had gotten to the point where we had so much in the state of Massachusetts that we had to develop

someplace else in the U.S. There are a lot of things about New Hampshire I always liked. I found it's a very attractive place to bring people and to attract talent to, and so I volunteered to bring the groups that I had up to New Hampshire. I brought 1200 people up and within a short period we were over 4,000, and we were the largest private, industrial employer in the state, the large non-government employer in the state. It was a challenge, an organizational challenge. It was different than building computers. It was different than extensions of the past. This was during Michael Dukakis' first time around -- which I didn't have much faith in then --- and it was an opportunity to get away from him. [CHUCKLING] It was a big multiple challenge. How do you move 1200 people?

INT: Was that one of your bigger challenges at Digital?

SO: No, I'd say the bigger challenges were on a smaller scale but earlier, like starting up the European operation, all alone and doing it in one week. Being the first one to go over to Japan to try to figure out what in the world that country was all about. Back in '63, of course, all they turned out was junk and they were just very hard to figure out, because there wasn't much said or written about them. That was a challenge. Getting a sales organization started in the U.S. was a challenge.

Two of the best people I found while trying to build up the organization both happened to be from Canada. One was Denny Doyle, and the other one was John Leng. At that time there wasn't room for two powerhouses, so I got John Leng over to England as soon as possible and Denny Doyle managed Canada.

INT: How were we accepted first in the European market and then in the Far East?

SO: In a sense, you see, we went to Germany first because Germany was where we had done some business. In retrospect it may have been the dumbest place to start because overcoming the German ego -- a German can only buy German products and U.S. products were junk, maybe they were right I don't know -- was tough. Acceptance was tough. IBM had already paved the way for an American company in Germany but it was still tough. But we had some products that the Germans didn't have so that was a little help. I would say we were much more successful in the U.K. We had certain successes in France. It was hard to understand what was going on in Japan. It was certainly hard to understand what we had done. They were buying machines and we'd ship them and there wasn't much communication.

INT: Can you talk about the development of the DECmate,

which was yours?

SO: That was the word processing. The DECmate started
before the word processing. That probably has to be
viewed as one of the failures. I would say I wasn't
bright enough at that time to understand what the
significance of WPS [Word Processing System]. WPS was
probably one of the first database management systems
ever built, and of course nobody knew anything about that
at the time. It was by far the best word processing
system, by a long shot and yet we let Wang outmarket us.
I guess I wasn't able to convince the Operations
Committee of the significance of what we had, but maybe I
didn't understand the significance of what we had. We
could have beat up the world! But we were too successful
doing other things in order to put the resources onto
this. But we had Dan Bricklin working for us, who went
off and started Visicalc, which is what put Apple in
business. Apple had a nothing computer and nothing
people and the combination of Visicalc and Computerland
put them in business. No matter what they did wrong they
succeeded. Letting Dan Bricklin go off was a mistake,
but we had started the beginnings of database management
systems. The other thing I'd wanted to do, and never
really quite got to do, was build file servers at that
time. I did understand that concept but never really
quite got it off the ground. Again, it was that we were

in the beginnings of non-arithmetic computers, and so we developed a great product but we didn't quite market it successfully. I couldn't rally up enough interest among sales and engineering to do it. We designed, we didn't really build, the first word processor in the world. But back in 1963, when President Kennedy was assassinated, the first thing that President Johnson did when he took over, was say he was going to answer every letter sent to him within so many days and he couldn't do it by hand. So they sent out for bids where people would design and build a system that would enable him to answer the letters. We designed what we called the presidential letter writer [CHUCKLING], which was really the first--we didn't really build it -- word processing system.

[END OF TAPE 2]

SO: The press was always after Digital to forecast what
we were going to do in the future? [Ken] would never
forecast. There was kind of a principle, which was we
always tell the press what we're doing or what we've done
and we never tell them what we're going to do. That's
really paid off. They keep asking all the time.

INT: It's their job to ask.

SO: I'm still a lot more visible than I'd like to be. To
a large extent the press represents a bunch of 22 year
old kids that want to get their Pulitzer Prize next year
and they'll do anything to get it and they have no moral
character whatsoever [CHUCKLES]. That's not altogether
true, but you have to be on the guard for them, because
they'll do anything for a story. They just don't have
the same set of morals that we have, so you can't treat
them the same. The financial press can set you off guard
because some of them are quite responsible and mature and
know what they're doing. But every once in awhile
someone will come in and trip you up and they have no
regard for the 120 [sic] employees. I just saw on
television this morning, that somebody had written
something about Goldie Hawn that wasn't fair and the
whole tenor of the thing was that only actors and
actresses and people in the entertainment business are
treated unfairly in the press. But in reality anybody in

the public eye is subject to being mistreated. It's hard to understand why. I think Ken's done a terrific job of being able to tell them only what they need to know and be on guard for the welfare of the company and the stockholder even while being accused of witholding public information.

INT: In general I think that that's filtered very well throughout the corporation. I think people have a really good sense of what to say. I think Digital handled a tough situation like the deCastro event you referred to earlier very well.

SO: I think some of the tougher [press events] were Black Tuesday, for instance, which in principle was an order processing error. Ken has a unique ability to jump in and personally solve problems. When he doesn't know about them, when they're covered up, data processing errors, then it can become a catastrophe. I think that's what happened. I don't know anything about this latest difficulty, why it occured and why he didn't have the ability to go in early. Loyalty to employees can sometimes hurt employees. A no-layoff policy can hurt all the other employees. My reaction is Ken should have just gone in and laid off a bunch of people six months to a year ago and said "I'm sorry, but I take the responsibility for allowing some of our people to make a

mistake. But we're going to solve the problem right now,
and some people are going to be hurt, but the large
majority are going to survive and the company's going to
survive, and we're going to be in good shape." In other
words, the action is too small and too slow and it could
still be done in a nicer way. There have to be some
changes made and they could be done quicker.

INT: You left in '81?

SO: Yes. I think it actually came out to be legally
about July of '82. There were a lot of Securities and
Exchange and other federal rules about what an officer
can do and can't do.

INT: And you started in real estate?

SO: Right. I was not allowed to do any real estate
development by the Securities and Exchange Commission
until six months after I had officially resigned because
of the potential of forcing an employee to buy one of my
properties [LAUGHING]. That was the reason for the
delay. It's amazing how similar all businesses really
are in how you handle it and how you market; I think it's
the integrity of the business and the people that really
counts. One of the major things that Digital has always
done for the customer is provide value. I think value is

probably the key word in everything. That's why the PDP-8 was so successful; it gave a tremendous amount of value for the money. In almost everything that Digital has ever done, it has probably provided the customer with more overall value than anybody else, and that's why they were successful. It's amazing how so many other companies don't understand that. Essentially, that's what I have done in the eight or nine years since I've left, is to provide better value than anybody else. It can be a higher-priced product or a lower-priced product as long as the overall value to the customer as long as the value is consistent with the price. So I have high priced products like Diamond Ranch and then I have lower priced products like Meadowcrest. The reason I'm so much into this [GESTURES TO TOM PETERS' BOOK, Thriving on Chaos] is that I'm making major changes in one of the restaurants right now. It's very exciting. Some of the people aren't too excited about it, but again it's all with the idea of providing more value to the customer than anybody else.

INT: Digital seems to have been a company that thrived on change. That's what technology's all about.

SO: Yes. Even organization change. But Ken's concept -- and I'm not sure he clearly thinks of it that way -- is that you can't tell what's going on until you shake it

up. You don't want to go in and change without
understanding what's going on. So first you shake it up
and keep your eyes open and see what happens, and then
you make change. On the outside it may seem like change
for change's sake. Very few people can understand why he
shakes things up, because everybody really believes that
in their corner they're doing the perfect job, and they
can't understand the need for change. So Ken comes in
and shakes things up only to see what's going on
[CHUCKLES]. Some things have to float to the top and
some have to sink to the bottom.

INT: Would you say that it's the people who survive
those shakeups who succeed overall?

SO: No, I think there are some very good people who
don't understand and get upset with the shakeups and
still but get through it and survive and still don't
understand what happened. They may think that Ken is
mean or they may think he's crazy... It's more like you
can't see what's going on with everything buried in a
neat organization; you have to shake it up and see which
ones rise to the top. He's just very intuitive about
that, but doesn't tell people "I'm shaking you up to see
what's going on," he just comes in and shakes them up. I
think, on the other hand, there's some people that should
be shaken that he hasn't either.

INT: Is there anything else you'd like to add?

SO: I've had a few disappointments [in my career] but on
the whole I wouldn't have given up any of it for
anything. I feel so fortunate to be a part of something
so significant and that I enjoyed immensely. But I don't
want to sit back and glory on it, I want to keep going on
because it's the process that's important, and I have
other processes that are going on right now. Ken and I
agree that anybody can be successful in good times, but
it takes somebody unusual to be successful in bad times
and we are heading for some tough times. To me it's an
exciting adventure. Most people would curl up and go in a
corner. But with so many multiple problems that we're
faced with at the same time -- with international
disorder, fiscal crisis, many, many different parts of
the economy being in trouble, inflation -- it takes a
very clever and intuitive person to **thrive**, not **survive**
now, thrive on succeeding. I keep trying to do that and
I think I have confidence that I will. I think Ken has
the ability to make Digital survive, to thrive on the
difficulties in the world today in spite of how bleak it
might look. [CHUCKLES].

I think there has to be the major reorganization which is
taking place, which will bring survivors out, and the

ones going along for the ride will kind of disappear. The
other amazing thing is that people going along for the
ride don't like a rocky ride, they leave, they get off.
So it's a sort of a self correcting thing.

[END OF TAPE 3]