America's Future in Manufacturing

With its extraordinary capabilities in many areas of science and technology, America is now in a position to lead the world in a positive reinvention of human civilization. Powerful new tools that will unleash our intellects and imaginations are about to blossom forth – tools that will change the way we think, the way we work, and the way we live. Some of these tools will be the "man-you-factured" products described below – products from the following fields of human enterprise:

Computer science and information technologies:

Personal computing is in the midst of a virtual revolution. Dramatic increases in the power, the portability, the reach, and the affordability of computer hardware have been seen in the last decade. But, even more spectacular changes may come about in the next decade. It is likely that, in the future, most computer and video output will not be presented on display screens, but will be delivered directly to the consumer's retinas by tiny laser diodes, as described in the following Web pages:
"Tomorrow's Screenless PC" at http://www.mudoc.com/screenlesspc.pdf
"PBS announces grand prize winner" at http://www.mudoc.com/PBSprize.pdf
Those Web pages explain that, while the images delivered by such retinal projectors will be highly realistic and fully three-dimensional, their projections will require only millionths of a watt. And, best of all, when mass-produced they will be affordable by everyone.

Another major change that is about to be seen in computerdom is in the way that computers and people work with each other. There are profound differences in the way that computers and people process information. In their prodigiously powerful internal information processing systems humans employ a wide variety of so-called "natural languages" – highly complex, irregular, paritially-logical linguistic systems that are continually evolving. Computer and programming languages, on the other hand, are far simpler and are far more logically regular and consistent. The twain of these two disparate kinds of linguistic systems will meet in a new kind of computer language that people will be able to use in the same ways they use their natural languages. Such a language will prove to be a quantum leap forward in the effectiveness with which humans and computers can exploit and optimize each other's immense capabilities. We describe such a human/computer language, which we call *Easy*, at dozens of the Web pages at mudoc.com, including the following:
"Languages of the Future" at http://www.mudoc.com/mpms4.htm
"*Easy* Development" at http://www.mudoc.com/easydev.htm
and in the paragraph "It'll be *Easy*" at http://mudoc.com/newtools.htm

Education, reading, and learning technologies:

A software invention, *interactive movable type*, the centerpiece of *the mudoc technology*, a new reading technology that is now under development, will have a profound impact on all areas of education. This new kind of movable type will (1) enable everyone to read, (2) enable most readers to continually increase their ability to consume and understand text, and (3) lead to the rapid elimination of illiteracy around the world. The probable impact of interactive movable type is discussed on the Web page at http://www.mudoc.com/InvenOfMill.pdf

The function and operation of schools – indeed, of all modes and areas of learning – will be changed profoundly as the new communication tools, tools developed

largely in America, are implemented around the world. The following Web pages describe the impending changes:

"The Coming Revolution in Education" at http://www.mudoc.com/EdRev.pdf

"Reinventing Education in America" at http://www.mudoc.com/ReinventEd.pdf

"The End of Illiteracy" at http://www.mudoc.com/illiteracy.pdf

"New Tools for Learning a Second Language" at http://www.mudoc.com/Learn2ndLang.pdf

"The Classroom of Tomorrow: An Educational Wonderland" at http://www.mudoc.com/newclass.htm

Empowered with the tools described in the pages listed above, most classroom teachers will be able to function as master teachers. They will find teaching far more rewarding and satisfying. Teaching will come to be seen as a highly desirable occupation. And classrooms will be seen as most desirable places to spend time in.

Fuel technologies:

Hydrogen is the fuel of the universe – and, on earth, it is the fuel of the future. The inexhaustible supply of hydrogen on the earth's surface is one of the two main reasons. The other is that, in combustion in a wholly oxygen environment, hydrogen is completely non-polluting. Its only by-product is water, pure water, which, itself, will become an increasingly important and valuable consumer product around the world. The continually increasing demand for fuel and the continually decreasing supply of petroleum, natural gas, coal, wood, and other carbon-containing fuels will accelerate R&D efforts to produce liquid and gaseous hydrogen at lower and lower costs. Thus, one of the major manufacturing categories in the U S will soon be the manufacture of the products and tools involved in the production, distribution, and consumption of hydrogen as a fuel.

Several Web pages at mudoc.com discuss the development and use of hydrogen as a fuel. Three of these are:

The description of *The Metafarm* at http://www.mudoc.com/newtitls.htm

"The Home of Tomorrow: The Good Health Home" at http://www.mudoc.com/hmoftom.htm

"Building a Healthy Haiti" at http://www.mudoc.com/Haiti.htm

Energy technologies:

In addition to its central role in developing hydrogen as a fuel, America could become the world leader in the development and use of the many other potential power sources on our planet. With its financial resources, its great technological prowess, and its large geographical expanses, America has the opportunity of leading the way in solar power generation, wind power generation, geothermal power production, hydropower generation, biomass power generation, and other means of generating electricity. With the development of the different and varied methods of generating electricity, the U S will be able to reduce and replace much of the costly, inefficient, and wasteful power grid that covers the nation. As time goes on, larger and larger percentages of the electrical power that is consumed will be produced at or near its place of consumption. "The Home of Tomorrow: The Good Health Home" at http://www.mudoc.com/hmoftom.htm discusses the impact that such rapidly changing technologies will have on the way we live – and about where

we live. One of the major hypotheses developed in the forthcoming novel, *The Metafarm* (see http://www.mudoc.com/newtitls.htm), is that of a thoroughgoing revolution in the production and use of energy around the world in the next decade.

Housing and building technologies:

Different methods of providing electrical power to homes and other buildings will be only one of the major changes we'll see in how we build and utilize these structures. New building construction technologies and techniques will greatly reduce the energy requirements of heating and cooling the structures in which we live and/or work. The safety and durability features of the structures will be dramatically improved. They will be far less prone to failure or collapse in the event of natural events like hurricanes, tornadoes, floods, wildfires, earthquakes, tsunamis, and related events. The nature of such changes will be depicted in considerable detail in *The Metafarm*. The changes are outlined in the novel's synopsis and chapter summaries in *The Metafarm Plan*, a plan that forecasts many of the changes that are likely to be seen in the next decade or two. Copies of *The Metafarm Plan* are available on request from The Mudoc Corporation.

"Mrs. Obama's Dream House" at http://www.mudoc.com/DreamHouse.pdf is a page that describes four new kinds of facilities (the *mu room*, the *pool room*, the *greenwing*, and the *household mainframe*) that are likely to be seen in most of tomorrow's new homes.

Transportation technologies:

In the next two decades, dramatic changes will be seen in how and why people and products are transported from one location to another. In lieu of transporting our bodies to distant locations, our new communication technologies now enable us to simply extend our digital personas to any other place on earth. They are changing the way we deal with each other. We can now easily have face-to-face discussions with family members, friends, teachers, employers, co-workers, customers, and others with whom we wish to talk or to communicate in other ways. This ability obviates the need for much of the travel we now do. Our new communication tools can actually facilitate a high degree of camaraderie and familiarity without requiring close physical proximity. A brief description of how our new tools will function as the digital "in-person transporters" of tomorrow is available in "The classroom's new tools" paragraph at the Web page http://www.mudoc.com/newclass.htm .

The physical transportation of goods from one place to another will also change markedly in the near future. For example, the transportation of food products from farm to market will be substantially reduced because much of the food that is consumed will be produced at or near one's residence. "The Home of Tomorrow: The Good Health Home" at http://www.mudoc.com/hmoftom.htm describes how food production and consumption will soon undergo dramatic changes.

The extensive use of the hydrogen that is produced in-house or piped-in will greatly reduce the need for and use of vehicles that transport gasoline, coal, fuel oil, and related energy products to power generation facilities and/or to consumers.

Marked changes will soon be seen in the marketing and distribution practices of hard good manufacturers. More and more products will be shipped directly from the manufacturer to the user. Instead of manufacturing and shipping products in large batches to retail marketers, the manufacturers' output levels will be based on

the prepaid orders received from purchasers. This will reduce the waste of over-production, will assure adequate cash flow to cover the costs of production, and will benefit the consumer through lower costs. Such changes in marketing will lead to substantial changes in the way our transportation systems function.

The transportation methods employed in the less-developed countries (LDCs) will differ considerably from those employed in the U S and the other advanced nations. The distribution of hard goods, particularly computers and computer-related products, in the LDCs will initially be through *information dispensaries* (which are described in Chapter 3 of *The Mu Primer* – a textbook that will help prepare one for using the tools of the mudoc technology – the manuscript of which is available at http://www.mudoc.com/mpms3.htm). The information dispensaries in the LDCs will gradually evolve into "MuCenters," the kind of retail outlet that is described in the last paragraph of Chapter 3. As this evolution occurs, changes in the methods of distribution and delivery of most durable goods in the LDCs will be accompanied by concomitant changes in their transportation systems.

Automotive technologies:

The character and design of the ground vehicles used to transport people from one location to another will change in many ways. The extremely complex, costly, and dangerous vehicles now in use will be gradually displaced by vehicles that are far simpler, far safer, far easier to repair, and far more efficient. The new vehicles will have personalities reminiscent of Kitt, the talking car of the 1980's TV series, *Knight Rider*. The heart of the vehicles will be intelligent computers that can communicate with both its passengers and any computers in other vehicles in its vicinity. The language used by both the computers and the passengers in the vehicles will be *Easy*, a new kind of computer language that can be used like a natural language. Such a language is discussed on page 1 above and in the last paragraph on the Web page http://www.mudoc.com/InvenOfMill.pdf

In addition to highly intelligent and interactive cars, other kinds of personal transporters will be developed and used widely. For example, in those countries with limited roadway and highway systems, vehicles like the hydrogen hovercraft will have greater utility than vehicles that move on rolling tires and require heavy load-bearing hard-surfaced roadways. (The hydrogen hovercraft is one of a variety of non-auto vehicles that is predicted for use in many nations. It is depicted in the novel, *The Metafarm*.)

Medical technologies:

This is an area in which the U S clearly leads the world – and it has the opportunity of expanding its lead. At present, however, our medical care system is handicapped by the haphazard, counterproductive, and disparate elements that comprise the field. The commercialization of the field has made costs of treatment prohibitively high for many people and has greatly reduced the effectiveness of its efforts in treating our population as a whole. The thoroughgoing combination of preventive and curative measures to improve the health of the country's population – along with a fully-computerized national records-keeping system and well-supported and organized R&D efforts – promises great advances in the healthcare facilities and operations in America. By making comprehensive healthcare services available to everyone, the vitality and productivity of the nation's citizenry can be greatly improved and the overall costs of care greatly reduced.

The development and widespread production of the kind of home living environments that are depicted in the Web page "The Home of Tomorrow: The Good Health Home" at http://www.mudoc.com/hmoftom.htm will yield great reductions in the difficulties and costs of maintaining healthy families.

Climate control technologies:

Our hell-bent efforts to cook our planet seem to be working remarkably well. At the present rate – and without marked changes in our behavior – our species could succeed in evolving itself out of existence within a few additional generations. The page, "On Saving a Dying Planet" at http://www.mudoc.com/sustainingEarth.pdf, spells out a course correction that could, through an effective worldwide education and enlightenment effort, enable us to avoid such an outcome.

In *The Metafarm* a number of small-scale and large-scale countermeasures that could be employed to control the climate changes that are threatening our survival are described. One of the large-scale countermeasures is a fleet of cloud-producing satellites called *superscoopers*. A superscooper is a large satellite that circumnavigates the earth collecting some of the errant hydrogen gas that has been inadvertently released by many of the billions of human users on the ground. In addition to collecting hydrogen, the superscooper collects oxygen – and both the hydrogen and oxygen that are collected are liquefied. The two elements are then combined in combustion chambers that expel billowing white clouds behind the craft. By controlling the release of the clouds along the superscoopers route, selected areas on the earth's surface can be chosen to have increased cloud cover and rainfall. The upward reflection of the sunlight on the clouds produced by the superscoopers, in combination with the shade and rainfall delivered to the earth's surface, help reverse the rise in the temperature of the earth's atmosphere.

The human family is in obvious peril, but the members of the family are clearly capable of averting the impending disaster. Through collaboration and cooperation, the means needed to avoid self-destruction can and will be found. Change agents like the superscoopers may be an imaginative, but fanciful, means of effecting the climate changes that are needed. But, with the new tools and technologies that are appearing on the horizon, combined with the great intelligence, inventiveness, and imagination possessed by large numbers of our species, the survival of Homo sapiens should be successfully extended for many additional generations.

If you have any comments, questions, or requests, please contact me at one of the points cited below:

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Wayne Reed Porter, CEO
The Mudoc Corporation
Developers of interactive movable type
and the tools of the mudoc technology
(mudoc is a contraction of "meaning unit document"
and is pronounced with a long u as in "music")
website: www.mudoc.com
email: mudocman@gmail.com
mail: 616 East Julie Drive, Tempe, AZ 85283-2914
phone: 602-265-1864
fax: 480-347-2701