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Norms for an Information Age

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Our Confession

We make grateful use
of the good products of science and technology,
on guard against idolatry
and careful to use them in ways that fit
within God's demand
to love our neighbor
and to care for the earth and its creatures.

from *Our World Belongs to God*
Contemporary Testimony, par. 55
CRC Acts of Synod 1983

Introduction

The struggle for the contemporary Reformed Christian community in any age is to know when to accept the good products of science, technology, and culture, in general, and when to curtail such products and developments because they lead to idolatry or would bring harm to our neighbor, to the earth, and to its creatures.

The Contemporary Testimony[1] suggests we make grateful use of the products of science and technology, guarding against misuse. We can reject as contrary to God's will certain applications or certain

developments in society and technology, but there is no way that we can eliminate these developments.

All discovery associated with the cultural mandate to "open-up" the creation to its intended meaning has as its foundation the creational structure which is the raw material for scientific investigation and makes discovery possible. There is a cohesiveness to the created order that enables humanity to understand and develop the creation.

Regenerate and unregenerate humanity work within the same context. Human-centered or secular work is misdirected, but can produce meaningful insights because it too is bound to creational structure. The spirit which governs this work and the use that is made of these insights and technological discoveries is what separates the human-directed from the God-directed.

This series of papers deals specifically with the scientific and technological activities of humanity and this paper deals with the non-philosophical structures of knowing and knowledge and the technological implementation of an information-based society.

Norms or principles of guidance for the Christian life for technological, social, or cultural developments are fixed as the revealed Will of God. These norms are authoritative and unchanging. However, because of the dynamics of cultural developments, the positivising of these norms may change as our knowledge and understanding of the creation changes.

The norms for family, for example, are clear from the Scriptures, but cannot be applied unless the concept of family has a specific concrete experiential formulation. At one time the term family meant a father, a mother and a rather large number of children. Today that term has been revised to include single-parent families and childless families. This change has not changed the norms for family life, but it has changed our understanding of what constitutes a family.

Regenerate and unregenerate humanity work within the same context. Human centered or secular work is misdirected, but can produce meaningful insights because it too is bound to creational structure.

Because of the dynamics of the "opening process" of the various creational structures, the formulation of the norms which speak to these structures needs to be tentative because the development lacks an historical context needed to clarify the norms. The passage of time and the accompanying cultural developments may be necessary to give additional insight to the meaning of the norm for a given structure.

The tentative character of the positivising of norms can also be argued from the current debate dealing with the role of women in society and church. History is full of similar issues.

The fact of directional living is that we live in the present, informed by the past, setting directions and plans for the future. Thank

God that our Reformed heritage provides us with a solid foundation from which to build and plan.

In this paper I shall attempt to identify norms which hold for cultural and technological developments which have given rise to what is called the Information Age.

The identification of such norms must be quite general at this time since the true character of the Information Age is just beginning to be developed. The long term effects of the characteristics of this age are as yet unknown and can only be conjectured.

Characteristics of the Information Age

The terms "Information Age" or "Information Society" have imprecise meanings. It is generally accepted that the key element in such a society or age is the ability and need to handle vast amounts of information or data in a very efficient manner. The introduction of the computer has given people the ability to do this at speeds and efficiencies that could not be imagined a decade ago. In this age, information is considered a new resource.[2]

Thinking and knowing is a particularly human function. When a machine is developed that can duplicate some of the characteristics of this function, then there is little wonder that such a machine will significantly impact human society.

In the context of information systems, data is described as unrefined facts or pieces of information, and information is data that has been processed into a form that is useful to the user in making decisions.[3]

For the purpose of this paper and without further definition or philosophical context for each of these terms, we will assume that the Information Age is the period of cultural development when information is a key to organized social enterprise.

Alvin Toffler in his book *The Third Wave* has traced the development of society as an agrarian-based society, the first wave, through an industrial-based society, the second wave, to an information-based society, the third wave.[4] He has identified a number of characteristics of the various forms of society, some of which I will discuss shortly. Two elements pervade these social developments: the correlative increase in speed and in amount of information.

When the common mode of transportation was horse and buggy, the driver—a man, woman, or child—moved slowly, and had to know little in order to reach the expected destination. Most of you have heard the stories of how the horse would know the way home from a visit to town. The ride home in such a vehicle with a special friend was much more romantic than in the high speed automobile because there was little to detract from the important interests of the moment.

By contrast, the skills required of the Indianapolis 500 driver reaches the upper limit of human reaction time. A number of drivers at the 1984 race admitted that the speeds with which the cars were racing were too fast for the driver to be in complete control. There was no time left to compensate for the unexpected.

This example illustrates how the two elements of speed and information are strongly correlated. If we consider speed in its broadest sense as the rapidity with which events happen, not merely as the reading one obtains from the speedometer, then numerous examples can be given which make the point that immediacy and complete information are correlative. The fact that we see events which happened within a given day from all parts of the world further illustrates this point.

Any analysis of the Information Age will have to take into account that a society in this age is subject to stresses that were unknown in the previous age. The person of this age will be asked to respond faster to the demand for more information. This fact will adversely influence the ability to "wait on" and "rest in" the Lord. Waiting and resting in the Lord are norms for a person of any age, but a godly rest will be more difficult to achieve because of greater social and work

pressures. We will have to face this issue.

In this series of lectures, technology is considered to be the human activity of forming, planning, and implementing through the use of tools.

The tools of an information age are those which provide complete and immediate information. The following are examples from the present in which an informed human reaction is required and some action must be taken immediately.

Today economic factors are monitored continuously, and the reaction to the value of the dollar on the international market is immediate. Bankers must keep continual watch and respond accordingly, and investors make money from the speed and information phenomena in the world money markets.

The pilot of the commercial jetliner has no more than the involuntary reaction time to escape the potential mid-air collision. Human reaction time is too slow to avert such disasters, so on-board computers control the plane and feed information to the pilot with sufficient lead time so that appropriate action can be taken.

In each of these examples the persons involved have information tools which receive, process, and transmit data and information faster than the human mind can accept and comprehend such information. Yet if these tools were not there the necessary decisions would be less than adequate.

The Agrarian Society of the early civilizations had tools which increased their potential to produce. The tools of this age were direct extensions of the human laborer and enhanced the human abilities. These tools did not provide information which could be used to improve the method of production.

In the industrial age, the emphasis was synchronization, standardization, and specialization. The information age can bring the potential for more diversity, individual expression, and individual care.

The Industrial Revolution introduced not only fossil fuels but unsupervised mass production in which tools controlled by humans were great at repetitive tasks and forming identical products (hence the term mass production).

Within the Information Society, the ability to produce in mass is still present, but monitoring tools also exist to de-massify the product. In other words, each item produced can be certified or rejected as an appropriate end-product at the time of production.

In the society of the "Third Wave" as defined by Toffler, the emphasis on individualism as opposed to mass collectivism, and the re-emergence of the home as a central institution are elements of the Information Society which people of all perspectives would see as being for the common good.[5]

If the defining trait of industrial production is mass production, then a shift is already evident. We are shifting to information-based, highly customized production and distribution of both goods and services. Such a shift has tremendous implications for social and community struc-

ture, and personal development, not just economic or industrial development.

Norms for the Information Society

Hear, O heavens! Listen, O earth!
For the Lord has spoken:
"I reared children and brought them up,
but they have rebelled against me.
The ox knows his master,
the donkey his owner's manger,
but Israel does not know,
my people do not understand."
Isaiah 1:2, 3 (NIV)

A Biblical concept of knowledge is much more than gathering data and recording information, terms which are commonly used in a discussion of this sort. A person has knowledge if in love to God, in love for his neighbor, and in care for the earth and its creatures, this person faithfully applies the data and information entrusted to him or her to the given problem or situation.

The element of knowledge in the passage from Isaiah is caring. The ox and donkey feel the care of the owner, but Israel in disobedience no longer cares for its Provider. If we take this interpretation of knowledge as the direction of the move into the Information Age, then the application of data and information and associated technology must take the form of genuine concern for all the things of God's creation.

The two elements of information and speed suggested earlier are significant. More complete information about one of the things of this creation will enable us to give it more complete care. The speed with which we receive such information will enable us to act more quickly. However, we will need insight to see what is appropriate information and what is disinformation. The information which is supplied will be no better than the source, and the decision will be no better than the information which was supplied and the motive of the person using this information. At this point the direction of the heart will determine how much knowledge becomes Godly care and how much remains merely misguided good intentions.

Directives for Specific Areas

The church of God moves with history, it makes history, it is a part of history. As such it is responding to cultural developments. Some would prefer to be Luddites, rejecting modern technology, but Scripture clearly indicates this is not an option. The command is to work and witness. We must reform where necessary, reclaim where fallen, and know the unknown. We are the caretakers of the creation and as such we are "knowers" and must be busy in that work.

In the industrial age, the emphasis was synchronization, standardization, and specialization. The information age can bring the potential for more diversity, individual expression, and individual care. The repetitive work of the assembly line will likely be done with robots, and humans in the work market should become caretakers. The shift should be from the concern for mass production to that of individually monitored production.

The economic impact of such a shift should be that wages shall be determined according to the value of the human service rendered, not according to the value of the inaminate product. Trends of this sort are already evident, one of which might be the introduction of comparable worth studies and wage programs in a number of states and communities. Basically I feel that pay for human input is more Biblical than pay according to goods produced, but I know that such trends will radically change present economic structures.

Education in the Information Age will likely take on a new character. Because the basic resource of this age is information, knowledge, insights and intellectual creativity will be the raw materials for productive work. This means that education will never end. Education for this age will need to be customized, available to everyone, in the home as well as in schools, and much more

individualized. Such an education will no longer have the theoretic-practical division.

Agriculture is also subject to the "Third Wave" type of trend. At the time of the birth of this country about 25 percent of the adult population was engaged in farming as a full-time occupation. Today that has been reduced to about 4 percent.[6] This trend has led to the demise of the family farm. The critical state of the agriculture enterprise today indicates that this trend is likely to continue.

When considered in the light of the technological trends of the Information Age, the plight of the farming enterprise can be explained. The technological move from doing farm work with horses to tractors, with the equivalent of two hundred horses, has taken away the need for human labor. Along with the decreasing requirements for human input have come other technological developments such as fertilizers and pesticides, which increase production from the same acre of land. These factors have led to a level of production which exceeds demand in spite of increasing world population and potential world market.

Unfortunately problems of transportation and political corruption in many parts of the world are factors which hinder the development of food markets in parts of the world where people are starving. These problems and the fact that impoverished countries cannot afford to buy food from developed countries will continue to limit the export effect on the North American agriculture enterprise.

Farming in the Information Age is more than ever before influenced by the elements of information and speed. The development of information is evidenced in the increase of agriculture service-related industries. Speed is apparent in the increasing size of farms and farming equipment. The demise of the family farm and the development of mega-farms are a result of both factors. As farm size increases, the need for information grows. Market and price information must be constantly available so that appropriate management decisions can be made.

With increase in knowledge, if this knowledge carries with it the Biblical sense of care, humanity should be able to expend more time tending this creation as englightened stewards.

Farming is a product-oriented enterprise. The food grown provides the economic base for this industry. The move toward an information-based society and the associated high-technology farming enterprise means that the family farm will require minimal human input in the form of manual labor. The family farm of the Information Age will involve various members of the family in a variety of occupational forms. It may be that only one person in this family will be involved in the work of the farm as we know it today. The other members of the family will serve as information agents. They will plan for soil care, crop development, market trends, crop nutrients, pest control, animal husbandry, and diversification possibilities. Such a farm can no longer have the product market as its sole source of income. Both products and practices will need appropriate forms of remuneration.

In the Information Age work will require a new definition as well. The new form of work will emphasize the service as the product of such work. Information Age economics must recognize the worker in terms of service to society and deemphasis the measure of the worker in terms of the goods produced.

What about some of the other social and cultural structures? Government, churches, leisure, transportation, energy forms, and others, all of these will have forms peculiar to the role they play in the context of the Information Age. In these and other areas of society, knowledge-based or expert systems[7] will be developed to aid the stewardly worker to make the most care-full decisions.

Conclusion - Summary

What are the norms for the Information Age? The only way to answer the question is to take insights from the Word of God for this creation.

With such a perspective some norms which become evident are that things should always be of service to creaturely needs, and humans should always be stewardly in their use of things. With increase in knowledge, if this knowledge carries with it the Biblical sense of care, humanity should be able to expend more time tending this creation as enlightened stewards. This type of service must be considered of greatest value and remuneration must be made accordingly.

Daily work will have the potential of building stronger relations. The family farm as we know it may become extinct, but not family work. Through telecommunications much of the service-work of the future could be done in the home. The result of this type of work could be used to build the family if we learn how to live in this setting.

At the present rate of growth, the amount of information doubles every five years. In an information-based society, the resource is renewing. With that resource we have the mandate to be stewardly with the nonrenewable resources.

The role of educational institutions will be significant if those institutions provide leadership in meeting the educational needs of this society. Industry, government, and other enterprises will have to undergo similar radical changes.

The caring that should accompany the information-based society will always be normative. If such a society fails in its mandate it is not because the concept is wrong, but because humankind refuses to see clearly what is the will of God for this age.

Technological developments which have led us to the threshold of the Information Age are such that the covenant community can demonstrate its covenant responsibility even more faithfully if it will recognize the wonder and power of the Creator in the care and love given for the creation. As redeemed people of God, our norm for life is to love and care because we are loved and cared-for.

Endnotes

[1]"Our World Belongs to God." Christian Reformed Church Acts of Synod 1983 - Contemporary Testimony, paragraph 55.

[2]Larry Long. *Introduction to Computers and Information Processing.* (Englewood Cliffs: Prentice-Hall, Inc.) 1984.

[3]Fred G. Harold. *Introduction to Computers with BASIC.* (St. Paul: West Publishing Co.) 1984.

[4]Alvin Toffler. *The Third Wave.* (New York: William Morrow and Company, Inc.) 1980.

[5]Alvin Toffler. *Previews and Premises.* (New York: William Morrow and Company, Inc.) 1983.

[6]"America at 200." *New York Times Magazine.* July 4, 1976.

[7]An expert system is a computer program that has built into it the information and capability that will allow it to operate at the level of an expert. Expert performance means, for example, the level of performance of M.D.'s doing diagnosis and therapeutics, or Phd's doing engineering, scientific, or managerial tasks. Expert systems have powerful reasoning abilities.

Knowledge-based systems rely on large information bases to analyze images or interpret speech and achieve perception, but do not call on any special human expertise to do these things. In many cases the terms expert systems and knowledge-based system are used interchangeably. These fields of investigation are part of the research being done in the area of Artificial Intelligence, (AI).

The Fifth Generation

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