Massive Impact Dilemma

In the Walt Disney movie *Flubber*, a professor invents an anti-gravity gel. He put a little flubber in his car, and immediately had a flying car. The following dilemma is about computational flubber.

A Computer Science professor has been working for many years on a new conceptualization of what computation is. He has published very little, because he has not yet come to a clear vision. One night, the professor has a dream in which he sees a new way to build computers. All of the work over the last many years condenses, and in the next two weeks, he designs and specifies a new type of computer, call it MetaShift computation.

The professor talks to several colleagues about the new idea, all under non-disclosure, since he suspects the idea may have commercial value. The net result after six months of close and secret collaboration, using only personal resources, is that the professor's team has built a new computer chip with some unusual advantages:

1. MetaShift computation is fully backward compatible. All programs which would run on vonNeumann architectures run on MetaShift. However, MetaShift has its own unique operating system.

2. MetaShift is fully reconfigurable. One MetaShift chip can be converted into *any* functionality within microseconds. With a MetaShift chip, specialized hardware (modems, decryption, cell phones, parallel processors, video acceleration, etc) is unnecessary. Instead the MetaShift is rapidly reconfigured into the desired functionality in real-time.

3. MetaShift works for all types of hardware architecture: CPUs, DSPs, floating-point coprocessors, real-time systems, cellular phones, automobile fuel-injectors, etc.

4. New programs written for MetaShift can be developed in a special language which is very easy to write, and provides automated debugging and program verification. Development time and cost for new programs is about 20% of that for other techniques.

5. The cost of manufacturing MetaShift is half of conventional fabrication costs.

6. The performance of a MetaShift chip is at least 5 times better than any other existing technology.

7. Because of the secrecy and uniqueness of the technology, it would be impossible for any potential competitors to market a similar product. That is, no competition to MetaShift would be possible.

When the MetaShift team did an in-depth market analysis, they discovered that within five years, MetaShift Corporation would probably take 50% market share from each of the companies listed below. Next to the company name is its market capitalization (market cap) in billions of dollars. (*Market cap* is the value of a company, the number of outstanding shares times the value of each share.) Further, when MetaShift went on the market, the market caps of these companies were likely to reduce rapidly to about 40% of current values.

COMPANY	*Market-cap ($billions)*
Microsoft	325
Cisco	270
Intel	249
IBM	196
SUN	98
TI	76
HP	72
Dell	68
Applied Materials	41
Compaq	40
Micron	27
Applied Micro	22
Xilinx	18
Altera	12
AMD	8
Apple	7
Total Impact:	$1.5 trillion

MetaShift itself would very likely reach a valuation of several trillion dollars within ten years. When MetaShift went to market, *most of the leading hardware and software operating system companies in the world will be put out of business within a few years*. As well, any company using computer technology would have to switch to MetaShift products within a few years in order to remain competitive. (This pressure is analogous to the impact of the Internet; the market dominance is analogous to any monopoly.)

The market analysis team then approached both the government and the financial sector with the commercial potential of MetaShift, disguised as a hypothetical story about innovation. After extensive consultation with the world's leading economic and regulatory authorities, MetaShift knew that if it went to market with its product, the following result was most likely:

> *Wide-spread economic chaos* would follow. The technology sectors of the world stock market would crash, losing $2 trillion in assets, and over a million people would loose their jobs. Next, several countries which were highly dependent on technology (US, Ireland, India, Germany, Japan) would enter a *moderate economic depression*.

At the same time, MetaShift would succeed spectacularly, making its first few thousand employees into billionaires.

QUESTIONS

Should MetaShift go to market with its product?
Are there ethical components to this decision?
Are there ethically appropriate compromise positions?
If MetaShift goes to market, should the government immediately intervene?