

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
PROJECT MAC

August 27, 1969

Reply to: Project MAC
545 Technology Square
Cambridge, Mass. 02139

Telephone: (617) 864-6900 x6201

TO: R. C. Daley
J. C. R. Licklider
J. H. Saltzer ✓

FROM: F. J. Corbató

SUBJECT: Reactions to the GE Proposal

Enclosed is a copy of some quick reactions on my part to the GE proposal.
I have sent a copy to Dick Mills.

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TO: R.G. Mills
FROM: F.J. Corbato
SUBJECT: Reaction to the GE Proposal of August 22, 1969

My overall reaction to the GE proposal is one of dismay and disappointment over its failure to meet requirements necessary to MIT. Moreover, the proposal does not give us any basis to begin discussion or negotiation since there is no mention of GE intentions, motives or long-range plans; I really worry for the future of the Multics Project, if we are reduced to the niggling level of arguing over arbitrary constants in even more arbitrary and obscurely motivated formulas.

There is an even deeper concern, however, over the proposal's lack of motivation, clarity or obvious equity because these are the very omissions which support the conjectures which were so prevalent at the time of the ARPA review: Namely, 1) that GE considered Project MAC a tap into a government budget, and was mostly concerned with maximizing the cash flow from MIT to GE, 2) that GE failed to comprehend the nature of the almost priceless software gift being dropped on their door, and 3) that GE lacked long-range vision as evidenced by the almost complete absence of preparations for the success of Multics (cf. paragraph 10 which I interpret as a reduction in GE interest with time). Needless to say, such conjectures, are hardly consistent with the development of a computer utility system which is expected to impact upon the future of the computer industry and the way which our society is structured.

I do have one cause for optimism, however; the above reactions on my part, (and presumably by others at M.I.T.), was so predictable that it is difficult to believe that GE precipitated it intentionally. This

together with my high regard for Walker Dix, leads me to believe that instead that there has been a major misunderstanding by GE and M.I.T.

The proposal as offered also has numerous minor problems, such as: somewhat garbled equipment lists (2 MG sets?), omission of System maintenance considerations, unspecified weekend use, the inclusion of DS10 instead of DS270 disks, and so forth. But all issues at this level could probably be worked out if it were not for the lack of reality in the substantive portions of the proposal: In short, there is not enough firm money at MIT to make their proposal work.. To make this clearer, I will attempt to briefly summarize the economics as I interpret the proposal:

The GE proposal in paragraph 7 says that prices should be set on the basis of commercial rental figures. Thus for the service plus augmented machine (2 processors, 384K memory) the prices should be based on monthly figures of:

GE rental:	\$105K + \$69K	=	\$174K
2nd shift maintenance:	9K + 6K	=	15K
Operations, datasets:		=	25K

\$214K

Assuming, as GE does, break-even billable hours should be at 50% use of 80% of the period 0800 - 2400, then one has for the billed hours

$$\frac{(16 \text{ hrs})}{\text{day}} (.8) (.5) \times (20 \text{ working days/mo}) = 128 \text{ hrs/month}$$

If we assume the machine capacity is 50 users, then this translates into a price of

$$\frac{\$214K}{50 \times 128 \text{ console-hours}} = \$33/\text{console-hour}$$

The cost to MIT according to paragraph 7 is:

GE rental:	$\frac{174K}{3}$	=	\$58K
2nd shift maintenance:		=	15K
Operations:		=	25K

\$98K/mo or \$1,176K/year.

It should be noted that the above annual outlay far exceeds the amount of usage that MIT can underwrite:

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MAC	\$400K
MIT general	200K
	<hr/>
	\$600K

Of course it is expected that more income can be realized but it is impossible at this stage to guarantee (i.e., completely predict) such a yield.

By contrast, if MIT were to operate by itself the current service machine (1 processor, 256K core memory) and GE were to dispose of the ~~service~~ ^{development} machine as it saw fit, then the corresponding figures are:

costs:	GE rental	\$105K X 80% (educ. disc.)	= \$ 84K
	2nd shift	5K X 80%	= 4K
	Oper. cost		= 25K

\$113K/month

prices would be on the basis of 333 system hrs/at 30 users billed per month.

$$\text{price} = \frac{\$113K}{333 \times 30} = \$11/\text{console-hour}$$

Thus MIT for its fixed, guaranteed budget would get three times as much computing service, and in turn would have prices which are comparable to CTSS (rather than 3 times as high!) As with the GE plan the difficulty of the annual cash outlay by MIT still remains,

and is $12 \times \$113K = \$1356/\text{year}$

Thus the unguaranteed portion of the budget is somewhat larger than in the GE plan, but this is compensated for by an unknown amount because GE must pay MIT for all GE usage incurred by them as partners in the development of the system. (There is some solace in that they would presumably only have to pay nice-low, MIT prices of \$11/hr!)

In summary it is hard to see how to make either of these plans work without further underwriting (i.e., guarantees to pay if Multics usage is under-utilized.) The success of Multics should make the need for underwriting vanish in future years, but for this first year, it appears crucial.