

SESSION REPORT



61	B323	JES2: JCL Error Study and Requirements Potpourri	65
SHARE NO.	SESSION NO.	SESSION TITLE	ATTENDANCE
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In our installation, our budget is not always sufficient for our requirements. That could be true in most installations, but in smaller shops the percentage of the data processing budget required for software would always be higher than a larger installation, since basically all the same software is required. Because of this, either we do not always acquire the software we should have, or we support 'home-grown' or 'free' software which requires more maintenance. As an example, IBM over the last few years has added different program products to the full MVS IPO system. In themselves, some of these products are not that expensive and most large installations already have them. But in our case, each time we have to justify this new product. Currently, we use a segmented IPO, not the full IPO, because of this. As well, monies to send technical staff on courses and to make a regular commitment to conferences we should be attending is a problem.

Each systems programmer in a small MVS shop usually is responsible for the support of many different systems or products. There is not a situation where one or two people or even a group can specialize in a specific area. In this way, there is very little backup for a person, if any. It is very difficult to free staff for new projects because they are too busy, and if a programmer leaves, the shop usually is in difficulty for a given period of time. The software environment can also be just as complex as in larger MVS shops. These complex smaller shops may have more manpower than some other smaller shops, but here each individual is heavily relied on to support multiple systems as well.

Tuning an MVS system for a small user is different than for a large user. You have similar tuning concerns, but in a small shop you do not normally have all the tuning aids and monitors. Also, you do not have the luxury to dedicate volumes for swapping and paging. Usually you are restricted by a limited amount of DASD to perform the proper reconfigurations that you would like to make.

These are some of the concerns I have come across as a small MVS user.

CONCLUSION

In conclusion, we feel that MVS can run quite well on a 3031 CPU, but like any other CPU that MVS runs on, MVS' performance is very dependent on the amount of real memory the computer has and the amount of DASD available to properly lay out paging and swapping data sets, and application volumes. Without sufficient memory and with a limited amount of DASD, we found that we have to restrict the use of the computer resources, especially during the prime shift when you are trying to provide an acceptable on-line response for your terminal users. We have had to cut back on our batch users to provide this response. This implies execution of their jobs during off-shifts and a reduction in the number of jobs submitted.

JES2: JCL Error Study and Requirements Potpourri

William Mosteller (BCG)

Session B323, SHARE 61

Wednesday, August 24, 1983, 1:00 PM

At the session today I hope to accomplish four things: 1) present the effect of a JCL error improvement in MVS SP 1.3.3, 2) discuss a JES2 change which supports automatic spelling correction, 3) show you the results of the JCL error survey, and, finally, 4) discuss JES2 requirements for which no other working session is available. The shortage of meeting rooms at this SHARE left us no choice but to include that last item with the first three.

We are very lucky to have two IBM representatives from the Converter/Interpreter here today. Leslie Dumas (IBM), as many of you will remember, discussed the Scheduler JCL Facility 6 months ago in San Francisco. Sandy Canetti (IBM) is, I believe, a new attendee at SHARE. [Give them the floor briefly.]

JCL Error Improvements in MVS/SP 1.3.3

As most of you know, I have been collecting JCL error messages for about two years, both at my own site and at a couple others. Across the sites, we observed that 9 error messages represent around 85% of the messages JCL coders see, and we developed a requirement for IBM improvements to those messages.

One of the messages, "Symbol Not Defined in Procedure" (IEF657), was dramatically improved in MVS/SP 1.3.3. Before, the message did not report the symbol the converter found offensive and did not tell where it found the symbol. Now, it provides both these vital facts about the error. Because improved specificity makes correction easier, I expected that the improved error message would reduce occurrences of the message. I expected a reduction because difficult messages cause users to resubmit their jobs without change, or with ineffective changes. Improved specificity, I reasoned, would increase the chances of a successful correction the first time.

John Kinn (CL), of Lockheed California Company, has MVS/SP 1.3.3 and my JCL error collection modification installed on his system. He was kind enough to provide me with data. Before, in March, 1982, 9.8% of his messages were "Symbol Not Defined in Procedure." During a week in June, 1983, that number dropped to 1.7%, representing a shift of 8.1%. This shift is enormous. Without MVS SP 1.3.3, "Symbol Not Defined in Procedure" represents 8.6% of the error messages at BCG, and 9.4% of the error messages at CSG (Canada Systems Group, data courtesy of Terry Burr (CSG)). Thus, the greatest difference among the three sites was 1.2%. Compared with these numbers, the 8.1% shift at Lockheed remains enormous.

I conclude that improving error messages makes JCL easier to use, and recommend that you install MVS/SP 1.3.3 simply for the benefits of the improved message.

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Symbol Not Defined in Procedure (IEF657) Error Frequency Improvement					
Message	Before April, 1982		After June, 1983 (Week)		Change
IEF601	31	0.9%	2	0.5%	-0.4%
IEF603	1	0.0%	0	0.0%	-0.0%
IEF605	945	28.4%	129	31.7%	3.3%
IEF607	178	5.4%	24	5.9%	0.5%
IEF610	6	0.2%	0	0.0%	-0.2%
IEF611	78	2.3%	11	2.7%	0.4%
IEF612	74	2.2%	6	1.5%	-0.8%
IEF613	8	0.2%	0	0.0%	-0.2%
IEF617	3	0.1%	0	0.0%	-0.1%
IEF618	83	2.5%	8	2.0%	-0.5%
IEF621	478	14.4%	59	14.5%	0.1%
IEF622	94	2.8%	6	1.5%	-1.4%
IEF623	103	3.1%	17	4.2%	1.1%
IEF624	144	4.3%	29	7.1%	2.8%
IEF625	52	1.6%	4	1.0%	-0.6%
IEF626	1	0.0%	0	0.0%	-0.0%
IEF627	42	1.3%	13	3.2%	1.9%
IEF628	9	0.3%	6	1.5%	1.2%
IEF629	44	1.3%	8	2.0%	0.6%
IEF630	243	7.3%	32	7.9%	0.6%
IEF632	227	6.8%	33	8.1%	1.3%
IEF641	21	0.6%	4	1.0%	0.4%
IEF642	14	0.4%	1	0.2%	-0.2%
IEF647	3	0.1%	0	0.0%	-0.1%
IEF650	2	0.1%	0	0.0%	-0.1%
IEF651	16	0.5%	1	0.2%	-0.2%
IEF652	83	2.5%	4	1.0%	-1.5%
IEF657	326	9.8%	7	1.7%	-8.1%
IEF658	5	0.2%	2	0.5%	0.3%
IEF663	2	0.1%	0	0.0%	-0.1%
IEF668	11	0.3%	1	0.2%	-0.1%
TOTAL	3327	100%	407	100%	-

JES2 Automatic Spelling Correction

Howard Morgan published a spelling correction technique in the "Communications of the ACM" in February, 1970. The technique corrects keywords with any one of four possible errors:

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Single missing letter,
 Single added letter,
 Single incorrect letter, or
 Adjacent letters transposed.

JES2 support of the /*JOBPARM and /*OUTPUT cards was changed so that when the keyword search routine failed, a spelling correction routine was invoked. The change logs success or failure at correcting the keyword and the proposed corrected keyword. However, the corrected keyword is not used to continue job processing, so that the change is customer transparent. We chose this route because we were not certain that spelling correction was effective, and did not want to commit ourselves to it before we knew the effect of the change.

Our results are mixed. As previous work with JECL cards had suggested, incorrect keywords do represent around a third of the errors. However, the vast majority of those incorrect keywords do not reflect typographic errors. Instead, they represent conceptual errors: the keyword is specified on the wrong control card rather than being misspelled.

Automatic Spelling Correction			
Month	JECL Errors	Keyword Errors	Fixed
February, 1983	31	12	2
March, 1983	35	11	0
April, 1983	53	18	7
May, 1983	34	10	1
June, 1983	52	16	5
Total	205	67	15
Percents	100%	33%	7%

My conclusion is that a specific error message reporting the incorrect keyword is appropriate, but that automatic spelling correction needs more study.

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JCL Error Survey Results

In hopes of improving the business case for IBM improvements to the JCL converter, we conducted a survey about the impact of JCL on an operating environment. Our intent is to quantify the cost of JCL to an installation. Fifty one installations responded. Generally, we asked what tools customers use to avoid JCL.

JCL Avoidance Techniques			
Method	Percent Using	Lines Needed	Man Years
TSO CLISTs	71%	3000	1 1/4
TSO Commands	40%	1800	3/4
SPF Panels	48%	1400	1/2
VM/CMS EXECs	10%	500	1/4
		Class Hours	O-J-T Hours
Training	55%	16	3
Other Computers	21%		
JCL Generators	13%		
Other Solutions	40%		
Migration Problems	19%		
Favor Requirement	65%		

The survey tells us that TSO CLISTs, Training, SPF Panels, and TSO commands are popular ways to cope with JCL. Further, it tells us that installations coping with JCL can easily invest a couple man-years in the problem. (I got man-years by dividing lines of code using the empirical DOD formula: 10 lines of *debugged* (repeat, *debugged*) code a day, 240 work days in a year.) Finally, it tells us that people want improvements to JCL.

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