

# Predictive Software Measures based on Z Specifications – A Case Study

Andreas Bollin

Software Engineering and Soft Computing  
University of Klagenfurt  
Klagenfurt, Austria

Andreas.Bollin@aau.at

Abdollah Tabareh

Department of Computer Science and Engineering  
University of Gothenburg  
Gothenburg, Sweden

tabareh@gmail.com

Estimating the effort and quality of a system is a critical step at the beginning of every software project. It is necessary to have reliable ways of calculating these measures, and, it is even better when the calculation can be done as early as possible in the development life-cycle.

Having this in mind, metrics for formal specifications are examined with a view to correlations to complexity and quality-based code measures. A case study, based on a Z specification and its implementation in *ADA*, analyzes the practicability of these metrics as predictors.

## Appendix – Background Materials

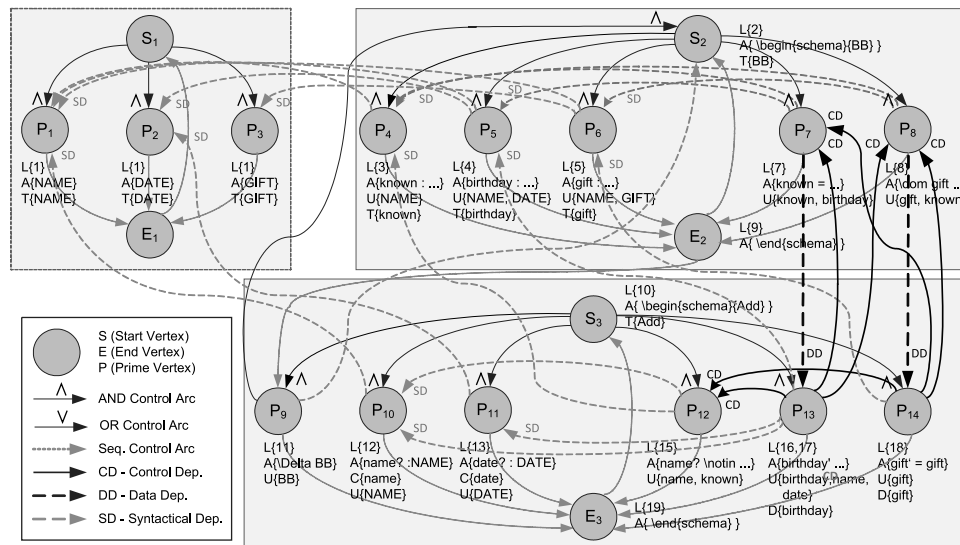


Figure 1: ASRN-Graph representing a small part of the Birthday Book specification. Such a graph is the basis for the calculation of the different measures. Predicates and declarations are represented by Prime vertices (P). They are enclosed between start (S) and end (E) vertices and are additionally annotated by position/line numbers, the related Z specification text, and the sets describing the use of the identifiers (D..defined, U..used, T..type defined, C..in/out channel). Logical combinations are expressed by logical control arcs - in our example AND control arcs.

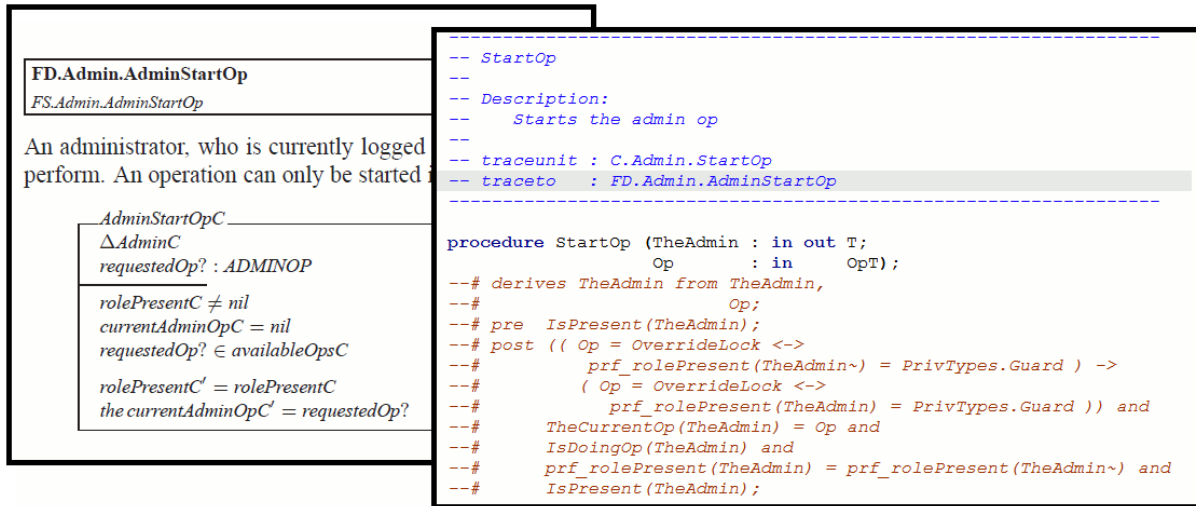


Figure 2: Snapshot of the Functional Design document (to the left) with unique identifiers for the units and the corresponding entry in the ADA specification file (to the right). This direct link enables the association between Z schemas and ADA modules.

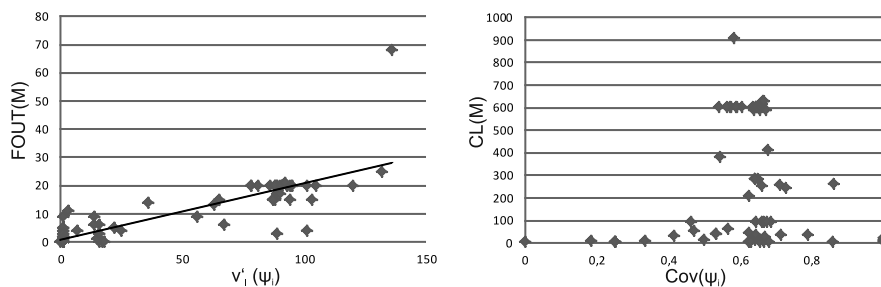


Figure 3: Scatter plots for the correlation between logical complexity  $v'_i(\psi)$  and  $FOUT(M)$  (left side) and for the correlation between coverage  $Cov(\psi)$  and Count Line  $CL(M)$  ( $n = 70$ ).

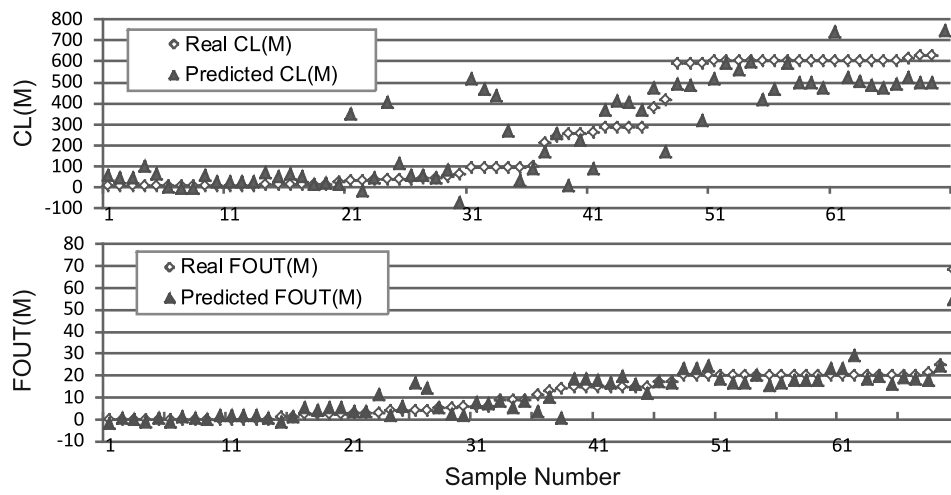


Figure 4: Comparison between the real and the predicted measures (according to the regression formulas) concerning the number of lines of code  $CL(M)$  and  $FOUT(M)$  ( $n = 70$ ).

| CC  | v'(l) | v'(u)  | DU    | Cov   | O     | χ     | USE   | DEF | AND | OR | Z – Name   | Nr. |
|-----|-------|--------|-------|-------|-------|-------|-------|-----|-----|----|--|-----|
| 33  | 17    | 6,901  | 94    | 0.667 | 0.957 | 0.096 | 54    | 2   | 12  | 0  | AdminFinishOpC   | 1   |
| 30  | 1     | 6,334  | 62    | 0.625 | 0.914 | 0.369 | 51    | 0   | 9   | 0  | AdminsDoingOp  | 2   |
| 30  | 1     | 6,545  | 66    | 0.625 | 0.966 | 0.371 | 51    | 0   | 9   | 0  | AdminsPresent  | 3   |
| 33  | 16    | 6,336  | 70    | 0.654 | 0.957 | 0.084 | 52    | 2   | 11  | 0  | AdminLogonC  | 4   |
| 31  | 15    | 6,189  | 88    | 0.640 | 0.957 | 0.092 | 50    | 2   | 10  | 0  | AdminLogoutC   | 5   |
| 31  | 1     | 6,334  | 62    | 0.625 | 0.914 | 0.369 | 53    | 0   | 9   | 0  | AdminOpsAvailable  | 6   |
| 35  | 18    | 6,630  | 71    | 0.679 | 0.957 | 0.084 | 56    | 2   | 13  | 0  | AdminStartOpC  | 7   |
| 60  | 1     | 11,902 | 102   | 0.629 | 0.896 | 0.339 | 105   | 0   | 20  | 0  | AdminR   | 8   |
| 10  | 1     | 715    | 10    | 1.000 | 0.767 | 0.305 | 6     | 0   | 2   | 0  | AdminTokenCurrent  | 9   |
| 57  | 16    | 5,571  | 385   | 0.662 | 0.270 | 0.257 | 98    | 21  | 0   | 1  | AddElementToLogC   | 10  |
| 97  | 25    | 10,609 | 327   | 0.789 | 0.983 | 0.184 | 145   | 6   | 0   | 0  | CancelArchive  | 11  |
| 168 | 36    | 15,471 | 1,139 | 0.676 | 0.119 | 0.397 | 277   | 69  | 0   | 0  | ClearLogC  | 12  |
| 122 | 22    | 9,283  | 1,066 | 0.624 | 0.000 | 0.319 | 282   | 43  | 75  | 1  | LogChangeC   | 13  |
| 9   | 1     | 1      | 0     | 1.000 | 1.000 | 0.000 | 3     | 0   | 0   | 0  | CertsCurrent   | 14  |
| 161 | 56    | 19,294 | 12    | 0.860 | 0.569 | 0.031 | 353   | 16  | 62  | 3  | NewAuthCertC, NewAuthCertContent   | 15  |
| 1   | 0     | 0      | 0     | 0.000 | 0.000 | 0.000 | 0     | 0   | 0   | 0  | CertificateStore   | 16  |
| 42  | 3     | 885    | 317   | 0.461 | 0.000 | 0.101 | 29    | 18  | 0   | 0  | LockDoorC  | 17  |
| 438 | 91    | 39,093 | 2,524 | 0.640 | 0.000 | 0.496 | 742   | 133 | 123 | 9  | TokenRemovedAdminLogoutC   | 18  |
| 63  | 1     | 9,039  | 105   | 0.533 | 0.515 | 0.406 | 71    | 0   | 0   | 1  | AdminMustLogout  | 19  |
| 439 | 90    | 38,739 | 2,506 | 0.651 | 0.000 | 0.492 | 738   | 130 | 119 | 8  | AdminTokenTimeoutC   | 20  |
| 451 | 95    | 40,517 | 2,573 | 0.641 | 0.000 | 0.496 | 756   | 133 | 127 | 9  | BadAdminLogoutC  | 21  |
| 63  | 1     | 9,039  | 105   | 0.533 | 0.515 | 0.406 | 71    | 0   | 0   | 1  | AdminMustLogout  | 22  |
| 403 | 88    | 38,025 | 2,427 | 0.644 | 0.000 | 0.470 | 682   | 102 | 113 | 4  | TISCompleteFailedAdminLogonC   | 23  |
| 403 | 88    | 38,025 | 2,427 | 0.644 | 0.000 | 0.470 | 682   | 102 | 113 | 4  | TISCompleteFailedAdminLogonC   | 24  |
| 345 | 78    | 33,605 | 1,775 | 0.605 | 0.000 | 0.458 | 585   | 61  | 115 | 1  | FinishArchiveLogBadMatchC  | 25  |
| 338 | 78    | 33,605 | 1,736 | 0.643 | 0.000 | 0.457 | 581   | 57  | 111 | 1  | FinishArchiveLogNoFloppyC  | 26  |
| 400 | 87    | 37,669 | 2,363 | 0.639 | 0.000 | 0.455 | 673   | 101 | 101 | 4  | GetPresentAdminTokenC  | 27  |
| 392 | 87    | 37,669 | 2,226 | 0.656 | 0.000 | 0.438 | 654   | 95  | 100 | 4  | NoOpRequestC   | 28  |
| 442 | 93    | 39,977 | 2,633 | 0.591 | 0.000 | 0.498 | 717   | 118 | 113 | 4  | OverrideDoorLockOKC  | 29  |
| 387 | 87    | 37,669 | 2,207 | 0.661 | 0.000 | 0.445 | 661   | 97  | 102 | 4  | RequestEnrollmentC   | 30  |
| 63  | 16    | 6,545  | 268   | 0.565 | 0.970 | 0.153 | 111   | 31  | 17  | 4  | ResetScreenMessageC  | 31  |
| 343 | 81    | 34,879 | 1,895 | 0.540 | 0.000 | 0.474 | 476   | 77  | 47  | 4  | ShutdownOKC  | 32  |
| 385 | 86    | 37,313 | 2,232 | 0.660 | 0.000 | 0.445 | 656   | 97  | 101 | 4  | ShutdownWaitingDoorC   | 33  |
| 368 | 95    | 40,001 | 1,652 | 0.571 | 0.000 | 0.320 | 619   | 52  | 137 | 3  | StartArchiveLogOKC   | 34  |
| 398 | 89    | 38,381 | 2,273 | 0.655 | 0.000 | 0.442 | 666   | 97  | 102 | 4  | StartArchiveLogWaitingFloppyC  | 35  |
| 399 | 89    | 38,381 | 2,273 | 0.655 | 0.000 | 0.442 | 666   | 97  | 102 | 4  | StartUpdateConfigWaitingFloppyC  | 36  |
| 533 | 105   | 44,079 | 3,094 | 0.636 | 0.000 | 0.489 | 878   | 153 | 0   | 2  | TISAdminLogonC   | 37  |
| 438 | 91    | 39,093 | 2,524 | 0.640 | 0.000 | 0.496 | 742   | 133 | 123 | 9  | TokenRemovedAdminLogoutC   | 38  |
| 600 | 120   | 49,847 | 2,927 | 0.573 | 0.000 | 0.473 | 866   | 149 | 0   | 1  | TISArchiveLogOpC   | 39  |
| 405 | 88    | 38,025 | 2,427 | 0.644 | 0.000 | 0.470 | 682   | 102 | 113 | 4  | TISCompleteTimeoutAdminLogoutC   | 40  |
| 474 | 103   | 43,365 | 2,675 | 0.665 | 0.000 | 0.468 | 759   | 118 | 0   | 2  | TISEnrolOpC  | 41  |
| 467 | 94    | 40,367 | 2,694 | 0.562 | 0.000 | 0.504 | 724   | 125 | 0   | 1  | TISShutdownOpC   | 42  |
| 417 | 94    | 40,161 | 2,394 | 0.671 | 0.000 | 0.457 | 716   | 101 | 0   | 2  | TISStartAdminOpC   | 43  |
| 446 | 93    | 39,977 | 2,633 | 0.589 | 0.000 | 0.497 | 719   | 118 | 0   | 0  | TISOverrideDoorLockOpC   | 44  |
| 465 | 101   | 42,653 | 2,618 | 0.645 | 0.000 | 0.494 | 742   | 112 | 0   | 1  | TISUpdateConfigDataOpC   | 45  |
| 409 | 91    | 39,093 | 2,386 | 0.657 | 0.000 | 0.461 | 696   | 100 | 103 | 4  | ValidateAdminTokenFailC  | 46  |
| 408 | 92    | 39,451 | 2,391 | 0.661 | 0.000 | 0.464 | 702   | 99  | 117 | 4  | ValidateAdminTokenOKC  | 47  |
| 397 | 89    | 38,381 | 2,299 | 0.663 | 0.000 | 0.446 | 679   | 98  | 111 | 4  | ValidateOpRequestFailC   | 48  |
| 397 | 90    | 38,737 | 2,323 | 0.666 | 0.000 | 0.458 | 684   | 98  | 113 | 4  | ValidateOpRequestOKC   | 49  |
| 213 | 65    | 28,117 | 665   | 0.685 | 0.925 | 0.105 | 313   | 3   | 51  | 3  | WaitingFloppyRemovalC  | 50  |
| 194 | 67    | 29,173 | 788   | 0.673 | 0.387 | 0.115 | 360   | 18  | 53  | 6  | DisplayPollUpdate  | 51  |
| 23  | 1     | 885    | 0     | 0.333 | 0.998 | 0.289 | 8     | 0   | 0   | 0  | PollKeyboardC  | 52  |
| 26  | 1     | 1      | 61    | 1.000 | 1.000 | 0.045 | 1     | 1   | 0   | 0  | PollTimeC  | 53  |
| 72  | 14    | 5,747  | 286   | 0.471 | 0.000 | 0.086 | 70    | 8   | 14  | 2  | TISEarlyUpdateC  | 54  |
| 554 | 132   | 57,021 | 3,191 | 0.543 | 0.036 | 0.293 | 951   | 141 | 140 | 10 | PollC, LogChangeC, AddElementsToLogC   | 55  |
| 60  | 14    | 5,747  | 266   | 0.714 | 1.000 | 0.074 | 61    | 3   | 10  | 2  | UpdateAlarmC   | 56  |
| 199 | 63    | 27,405 | 658   | 0.711 | 1.000 | 0.095 | 309   | 3   | 49  | 3  | UpdateDisplayC   | 57  |
| 12  | 1     | 2,653  | 6     | 0.857 | 0.932 | 0.317 | 32    | 0   | 5   | 0  | KeyStoreC  | 58  |
| 24  | 1     | 8      | 0     | 0.184 | 0.452 | 0.005 | 17    | 0   | 6   | 0  | TISMonitoredRealWorldC   | 59  |
| 102 | 7     | 3,184  | 20    | 0.726 | 0.847 | 0.182 | 73    | 0   | 15  | 0  | DoorLatchAlarmR, UserTokenR, AdminTokenR, FingerR, FloppyR, ScreenR, KeyBoardR | 60  |
| 11  | 1     | 1      | 24    | 0.250 | 0.000 | 0.013 | 4     | 4   | 3   | 0  | AddSuccessfulEntryToStatsC   | 61  |
| 11  | 1     | 1      | 24    | 0.250 | 0.000 | 0.013 | 4     | 4   | 3   | 0  | AddFailedEntryToStatsC   | 62  |
| 11  | 1     | 1      | 24    | 0.250 | 0.000 | 0.013 | 4     | 4   | 3   | 0  | AddSuccessfulBioCheckToStatsC  | 63  |
| 11  | 1     | 1      | 24    | 0.250 | 0.000 | 0.013 | 4     | 4   | 3   | 0  | AddFailedBioCheckToStatsC  | 64  |
| 414 | 101   | 39,035 | 2,156 | 0.669 | 0.000 | 0.433 | 713   | 101 | 0   | 1  | TISStartupC  | 65  |
| 15  | 1     | 1,069  | 42    | 0.417 | 0.945 | 0.304 | 9     | 0   | 0   | 1  | CurrentUserEntryActivityPossible   | 66  |
| 819 | 136   | 55,287 | 4,098 | 0.581 | 0.000 | 0.464 | 1,237 | 228 | 0   | 6  | TISProgressUserEntry   | 67  |
| 431 | 89    | 38,381 | 2,560 | 0.644 | 0.000 | 0.485 | 747   | 137 | 0   | 0  | TISReadUserTokenC  | 68  |
| 8   | 1     | 713    | 23    | 0.500 | 0.946 | 0.305 | 4     | 0   | 1   | 0  | UserEntryCanStart  | 69  |
| 3   | 1     | 357    | 19    | 1.000 | 1.000 | 0.302 | 3     | 0   | 0   | 0  | UserEntryInProgress  | 70  |

Table 1: First part of the list of experimental subjects (Z schema names). The schemas are numbered in the table, and these numbers are unambiguously related to the corresponding ADA names (Table 2).

| Nr. | Ada – Name                                    | CL(M) | CLC(M) | CLCD | CLCE | CYC | KNOTS | FIN | FOUT | SI     |
|-----|---|-------|--------|------|------|-----|-------|-----|------|--------|
| 1   | FD.Admin.AdminFinishOp                        | 5     | 5      | 4    | 1    | 1   | 0     | 3   | 0    | 0      |
| 2   | FD.Admin.AdminIsDoingOp                       | 5     | 5      | 4    | 1    | 1   | 0     | 1   | 0    | 0      |
| 3   | FD.Admin.AdminIsPresent                       | 5     | 5      | 4    | 1    | 1   | 0     | 5   | 0    | 0      |
| 4   | FD.Admin.AdminLogon                           | 7     | 7      | 5    | 2    | 1   | 0     | 1   | 0    | 0      |
| 5   | FD.Admin.AdminLogout                          | 12    | 11     | 8    | 3    | 2   | 0     | 5   | 1    | 9      |
| 6   | FD.Admin.AdminOpsAvailable                    | 45    | 28     | 7    | 21   | 7   | 5     | 1   | 0    | 0      |
| 7   | FD.Admin.AdminStartOp                         | 6     | 6      | 5    | 1    | 1   | 0     | 1   | 0    | 0      |
| 8   | FD.Admin.Retrieval.State                      | 5     | 5      | 4    | 1    | 1   | 0     | 2   | 0    | 0      |
| 9   | FD.Admin.Token.Current                        | 14    | 12     | 8    | 4    | 2   | 0     | 5   | 4    | 145    |
| 10  | FD.AuditLog.AddElementToLog                   | 254   | 87     | 35   | 52   | 10  | 1     | 51  | 6    | 16.654 |
| 11  | FD.AuditLog.CancelArchive                     | 38    | 28     | 11   | 17   | 7   | 0     | 3   | 4    | 37     |
| 12  | FD.AuditLog.ClearLog                          | 414   | 148    | 47   | 101  | 18  | 3     | 55  | 14   | 16.727 |
| 13  | FD.AuditLog.LogChange                         | 210   | 79     | 29   | 50   | 9   | 0     | 60  | 5    | 17.541 |
| 14  | FD.Certificate.IsCurrent                      | 22    | 22     | 16   | 6    | 4   | 0     | 18  | 5    | 154    |
| 15  | FD.Certificate.NewAuthCert                    | 262   | 237    | 185  | 52   | 12  | 5     | 7   | 9    | 23     |
| 16  | FD.CertificateStore.State                     | 6     | 5      | 4    | 1    | 1   | 0     | 1   | 0    | 0      |
| 17  | FD.Door.LockDoor                              | 96    | 71     | 26   | 45   | 10  | 2     | 22  | 11   | 289    |
| 18  | FD.Enclave.AdminLogout                        | 284   | 126    | 42   | 84   | 18  | 8     | 62  | 20   | 17.114 |
| 19  | FD.Enclave.AdminMustLogout                    | 39    | 30     | 13   | 17   | 5   | 2     | 4   | 9    | 77     |
| 20  | FD.Enclave.AdminTokenTimeout                  | 284   | 126    | 42   | 84   | 18  | 8     | 62  | 20   | 17.114 |
| 21  | FD.Enclave.BadAdminLogout                     | 284   | 126    | 42   | 84   | 18  | 8     | 62  | 20   | 17.114 |
| 22  | FD.Enclave.CurrentAdminActivityPossible       | 40    | 16     | 12   | 4    | 2   | 0     | 2   | 2    | 2      |
| 23  | FD.Enclave.FailedAdminTokenRemoved            | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 24  | FD.Enclave.FailedEnrollFloppyRemoved          | 93    | 64     | 16   | 48   | 9   | 5     | 4   | 15   | 59     |
| 25  | FD.Enclave.FinishArchiveLogBadMatch           | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 26  | FD.Enclave.FinishArchiveLogNoFloppy           | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 27  | FD.Enclave.GetPresentAdminToken               | 589   | 188    | 73   | 115  | 24  | 10    | 78  | 15   | 17.174 |
| 28  | FD.Enclave.NoOpRequest                        | 589   | 188    | 73   | 115  | 24  | 10    | 78  | 15   | 17.174 |
| 29  | FD.Enclave.OverrideDoorLockOK                 | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 30  | FD.Enclave.RequestEnrolment                   | 93    | 64     | 16   | 48   | 9   | 5     | 4   | 15   | 59     |
| 31  | FD.Enclave.ResetScreenMessage                 | 63    | 31     | 12   | 19   | 7   | 2     | 18  | 3    | 148    |
| 32  | FD.Enclave.ShutdownOK                         | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 33  | FD.Enclave.ShutdownWaitingDoor                | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 34  | FD.Enclave.StartArchiveLogOK                  | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 35  | FD.Enclave.StartArchiveLogWaitingFloppy       | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 36  | FD.Enclave.StartUpdateConfigWaitingFloppy     | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 37  | FD.Enclave.TISAdminLogin                      | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 38  | FD.Enclave.TISAdminLogout                     | 284   | 126    | 42   | 84   | 18  | 8     | 62  | 20   | 17.114 |
| 39  | FD.Enclave.TISArchiveLogOp                    | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 40  | FD.Enclave.TISCompleteTimeoutAdminLogout      | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 41  | FD.Enclave.TISEnrollOp                        | 93    | 64     | 16   | 48   | 9   | 5     | 4   | 15   | 59     |
| 42  | FD.Enclave.TISShutdownOp                      | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 43  | FD.Enclave.TISStartAdminOp                    | 589   | 188    | 73   | 115  | 24  | 10    | 78  | 15   | 17.174 |
| 44  | FD.Enclave.TISUnlockDoorOp                    | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 45  | FD.Enclave.TISUpdateConfigDataOp              | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 46  | FD.Enclave.ValidateAdminTokenFail             | 602   | 81     | 18   | 63   | 12  | 14    | 4   | 20   | 114    |
| 47  | FD.Enclave.ValidateAdminTokenOK               | 615   | 91     | 26   | 65   | 14  | 14    | 7   | 21   | 115    |
| 48  | FD.Enclave.ValidateOpRequestFail              | 630   | 218    | 87   | 131  | 28  | 10    | 80  | 17   | 17.176 |
| 49  | FD.Enclave.ValidateOpRequestOK                | 630   | 218    | 87   | 131  | 28  | 10    | 80  | 17   | 17.176 |
| 50  | FD.Enclave.WaitingFloppyRemoval               | 93    | 64     | 16   | 48   | 9   | 5     | 4   | 15   | 59     |
| 51  | FD.Interface.DisplayPollUpdate                | 93    | 44     | 20   | 24   | 10  | 1     | 20  | 6    | 906    |
| 52  | FD.Interface.PollKeyboard                     | 11    | 8      | 6    | 2    | 2   | 0     | 2   | 2    | 2      |
| 53  | FD.Interface.PollTime                         | 9     | 9      | 7    | 2    | 2   | 0     | 3   | 2    | 5      |
| 54  | FD.Interface.TISEarlyUpdates                  | 52    | 32     | 11   | 21   | 6   | 2     | 4   | 9    | 41     |
| 55  | FD.Interface.TISPoll                          | 381   | 197    | 78   | 119  | 28  | 7     | 59  | 25   | 16.897 |
| 56  | FD.Interface.UpdateAlarm                      | 35    | 32     | 21   | 11   | 7   | 1     | 7   | 6    | 18     |
| 57  | FD.Interface.UpdateDisplay                    | 257   | 127    | 51   | 76   | 15  | 1     | 50  | 13   | 16.681 |
| 58  | FD.KeyStore.State                             | 6     | 5      | 4    | 1    | 1   | 0     | 1   | 0    | 0      |
| 59  | FD.MonitoredRealWorld.State                   | 11    | 10     | 8    | 2    | 2   | 0     | 5   | 2    | 13     |
| 60  | FD.RealWorld.State                            | 244   | 115    | 60   | 55   | 14  | 0     | 89  | 4    | 16.785 |
| 61  | FD.Stats.Update                               | 7     | 7      | 4    | 3    | 2   | 0     | 1   | 0    | 0      |
| 62  | FD.Stats.Update                               | 7     | 7      | 4    | 3    | 2   | 0     | 2   | 0    | 0      |
| 63  | FD.Stats.Update                               | 7     | 7      | 4    | 3    | 2   | 0     | 1   | 0    | 0      |
| 64  | FD.Stats.Update                               | 7     | 7      | 4    | 3    | 2   | 0     | 1   | 0    | 0      |
| 65  | FD.TIS.TISStartup                             | 28    | 23     | 11   | 12   | 3   | 0     | 6   | 4    | 68     |
| 66  | FD.UserEntry.CurrentUserEntryActivityPossible | 30    | 15     | 12   | 3    | 3   | 0     | 4   | 3    | 5      |
| 67  | FD.UserEntry.ProgressUserEntry                | 909   | 288    | 55   | 233  | 30  | 35    | 8   | 68   | 604    |
| 68  | FD.UserEntry.TISReadUserToken                 | 36    | 18     | 7    | 11   | 3   | 0     | 16  | 3    | 901    |
| 69  | FD.UserEntry.UserEntryCanStart                | 13    | 10     | 8    | 2    | 2   | 0     | 9   | 1    | 1      |
| 70  | FD.UserEntry.UserEntryInProgress              | 6     | 5      | 4    | 1    | 1   | 0     | 2   | 0    | 0      |

Table 2: Second part of the list of experimental subjects (ADA modules). The modules are numbered in the table, and these numbers are unambiguously related to the corresponding schema names (Table 1).