Special Report from the Long Range Planning Committee

on

Bulletin Board Space Allocation

We recently had a problem of what was appropriate and who was responsible for one of our Church bulletin boards. We would like to test a theory of allocation of bulletin board space which is derived from the field of Information Theory used in designing computer-communication systems. Can this same theory help us make more equitable allocation of space on a church bulletin board?

Suppose we take the 4 by 6 ft unaffiliated bulletin in the hall between Hattie Porter Hall and the kitchen. If we first ask the Communications Committee to allocate one quarter of the board by assigning two square feet each to the Social Concerns Committee Chairman, the representative of Unitarian Singles(U.S.), and the U.U.Y.(youth [illegible])

Then we compute the remainder of the space allocation by the following procedure:

This system of allocation requires that first we take a poll of what topics are important to the members of our church. Then we compute the supplemental space allocation in proportion to two factors which are multiplied together. The first factor is the probability that members of our church are interested in a particular topic, such as problems of the aging, inflation, prison reform, civil rights, foreign affairs, human relations, psychological development, etc.

The second factor is a weighting factor which expands the space allocation for items which are relatively unknown or new to members of the church. The determination of the space allocated to each topic or group by this method gives a balance between a democratic space allocation and a featuring of material that is relatively not known (or not generally understood).

The computation of the supplemental space could result in the members voting additional space to the committee chairman or officers already having space or people could elect to have space for each individual who wanted space to have a 3" x 5" card space to put up whatever he as an individual member to say.

The questionnaire could be on a po·tcard as follows:

Reply to Communications Committee of the First Unitarian Church of San Jose.

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I prefer that supplementary bulletin board space be allocated to the topic, committee, or individual checked: VOTE for ONE

____ LRY(Youth Activities)	____ Unitarian Singles
____ Social Concerns Com.	____ Problems of Aging
____ Prison Reform	____ Civil Liberties
____ Women's Liberation	____ Men's Liberation
____ Astrology	____ Science
____ Cybernetics	____ Systems Theory
____ Other topic, specify:	_____

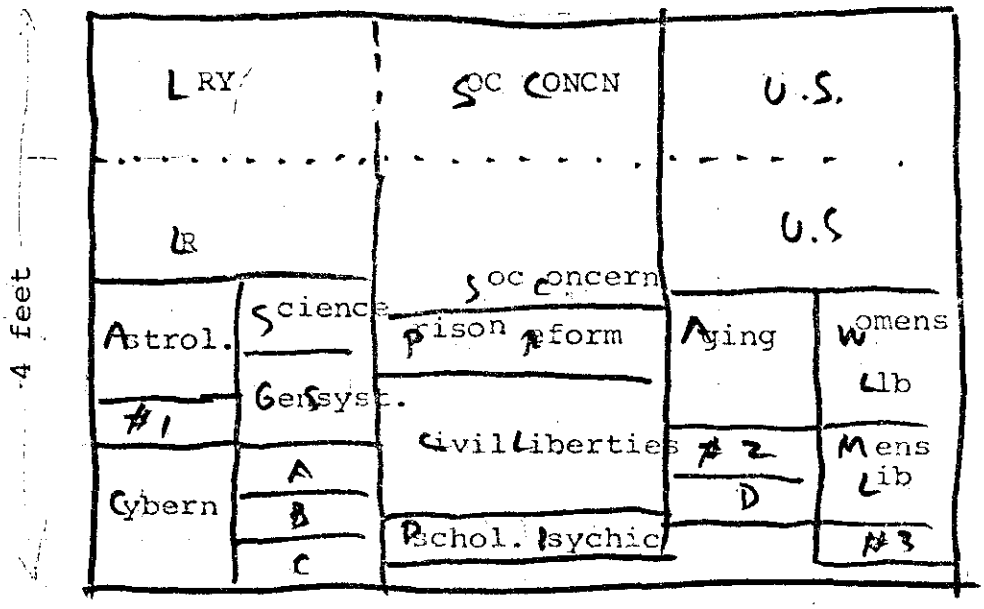
____ Space for my own 3x5 notice, specify your name in this case: _____

____ Psychology ____ Psychic Phenomena

For a hypothetical poll we might have the following results:

Category	Number	Probability	Negative Log_{10} Prob	- p log p	%	area	size
LRY	10	0.094	1.027	0.0965	9.21	213	14"x13
U.S.	15	0.142	0.848	0.1204	13.25	266	22"x12"
Soc.Concrn	20	0.189	0.725	0.1363	14.60	321	25"x12"
Aging	5	0.047	1.328	0.0624	5.91	130	12"x10"
Prison Refm	10	0.094	1.027	0.0965	9.21	213	19"x12"
Civil Lib.	15	0.142	0.848	0.1204	13.25	266	22"x12"
Women's Lib	5	0.047	1.328	0.0625	5.91	130	12"x12"
Men's Lib.	3	0.0283	1.550	0.0439	3.71	97	8"x12
Astrology	4	0.0377	1.424	0.0537	4.57	113	10"x12"
Science	2	0.0189	1.726	0.0324	2.80	73	6"x12"
Cybernetics	5	0.047	1.328	0.0624	5.91	130	12"x12"
Systems Th.	3	0.0283	1.550	0.0439	3.71	97	8"x12"
Other Topics:							
# 1	1	0.0094	2.027	0.0207	1.76	47	8"x6"
# 2	1	0.0094	2.027	0.0207	1.76	47	8"x6"
# 3	1	0.0094	2.027	0.0207	1.76	47	8"x6"
Individuals:							
Person A	1	0.0094	2.027	0.0207	1.76	47	8"x6"
Person B	1	0.0094	2.027	0.0207	1.76	47	8"x6"
Person C	1	0.0094	2.027	0.0207	1.77	47	8"x6"
Person D	1	0.0094	2.027	0.0207	1.76	47	8"x6"

The following is an illustration of how the bulletin board could be divided in accordance with the above computations:



The principles and similar computations are given in

COMMUNICATION THEORY in the CAUSE of MAN, Vol. I, No. 3-4, pp. 9-11 (Book Section 124 pp. 1-3).

Frederick B. Wood
9/1/75

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A computer program for computing the fractional allocation of bulletin board space is attached as pages 4 & 5. The sample calculation in the attached program is for ten groups and for different statistics, but can be used for the example in this report.

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EVEL 2.1  ( JAN 75 )                    OS/360  FORTRAN H EXTENDED

QUESTED OPTIONS: NODECK,XREF

TIONS IN EFFECT: NAME(MAIN) NOOPTIMIZE LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
                 SOURCE EBCDIC NOLIST NODECK OBJECT MAP NOFORMAT NOGOSTMT XREF NOP

              C ENTROPY TABLE PROGRAM & ALLOCATION   09/09/75
ISN 0002            DIMENSION LA(40),GROUPS(5,40),NUMS(40),GROUP(5)
ISN 0003           DIMENSION  P(40),ALG(40),GINF(40),FRS(40)
ISN 0004           READ(5,5) IHGT,IWDH
ISN 0005           WRITE(6,5) IHGT,IWDH
ISN 0006        5  FORMAT(5X,I5,5X,I5)
ISN 0007       10  FORMAT(5X,I5,5A4,I5)
ISN 0008       20  READ(5,10) IA,GROUP(1),GROUP(2),GROUP(3),GROUP(4),GROUP(5),NUM
ISN 0009           IF(IA) 30,30,25
ISN 0010       25  LA(IA)=IA
ISN 0011           WRITE(6,10) IA,GROUP(1),GROUP(2),GROUP(3),GROUP(4),GROUP(5),NU
ISN 0012           ITOP=NUM
ISN 0013           DO 27 I1=1,5
ISN 0014       27  GROUPS(IA,I1)=GROUP(I1)
ISN 0015           NUMS(IA)=NUM
ISN 0016           GO TO 20
ISN 0017       30  CONTINUE
ISN 0018           WRITE(6,35) ITOP
ISN 0019       35  FORMAT(10X,5HITOP=,I5)
ISN 0020           ISUM=0
ISN 0021           DO 40 I=1,ITOP
ISN 0022       40  ISUM=ISUM+NUMS(I)
ISN 0023           WRITE(6,42) ISUM
ISN 0024       42  FORMAT(5X,5H SUM=,I5)
ISN 0025           LSUM=0
ISN 0026           SUM=ISUM
ISN 0027           SUN=0
ISN 0028           DO 50 I=1,ITOP
ISN 0029           ANUM=NUMS(I)
ISN 0030           P(I)=ANUM/SUM
ISN 0031           ALG(I)=3.32*ALOG10(P(I))
ISN 0032           GINF(I)=-P(I)*ALG(I)
ISN 0033           SUN=GINF(I)+SUN
ISN 0034       50  WRITE(6,52) I,P(I),ALG(I),GINF(I),SUN
ISN 0035       52  FORMAT(10X,I5,4(2X,F7.4))
              C      FRACTION OF SUPPLEMENTAL SPACE
ISN 0036           DO 60 I=1,ITOP
ISN 0037           FRS(I)=GINF(I)/SUN
ISN 0038       60  WRITE(6,62) I,FRS(I)
ISN 0039       62  FORMAT(10X,10H GROUP NO=,I5,10H FRACTION=,F7.4)
ISN 0040           RETURN
ISN 0041           END
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   4          6
   1 GROUP NUMBER 1.....    10
   2 GROUP NUMBER 2.....    20
   3 GROUP NUMBER 3.....    50
   4 GROUP NUMBER 4.....     5
   5 GROUP NUMBER 5.....     1
   6 GROUP NUMBER 6.....    35
   7 GROUP NUMBER 7.....    20
   8 GROUP NUMBER 8.....    15
   9 GROUP NUMBER 9.....    30
  10 GROUP NUMBER 10....    10
    ITOP=    10
SUM=  196
         1   0.0510  -4.2903   0.2189   0.2189
         2   0.1020  -3.2909   0.3358   0.5547
         3   0.2551  -1.9697   0.5025   1.0572
         4   0.0255  -5.2897   0.1349   1.1921
         5   0.0051  -7.6103   0.0388   1.2309
         6   0.1786  -2.4840   0.4436   1.6745
         7   0.1020  -3.2909   0.3358   2.0103
         8   0.0765  -3.7057   0.2836   2.2939
         9   0.1531  -2.7062   0.4142   2.7081
        10   0.0510  -4.2903   0.2189   2.9270
     GROUP NO=     1 FRACTION= 0.0748
     GROUP NO=     2 FRACTION= 0.1147
     GROUP NO=     3 FRACTION= 0.1717
     GROUP NO=     4 FRACTION= 0.0461
     GROUP NO=     5 FRACTION= 0.0133
     GROUP NO=     6 FRACTION= 0.1515
     GROUP NO=     7 FRACTION= 0.1147
     GROUP NO=     8 FRACTION= 0.0969
     GROUP NO=     9 FRACTION= 0.1415
     GROUP NO=    10 FRACTION= 0.0748
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