IMPLEMENTATION TO LARGE SCALE OPTIMIZATIONTO MAXIMIZETASK FORCES INSIDE MEXICAN PRIVATE INSTITUTIONS

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Abstract.

A way of managinghumanresources withina private Mexicancompany in orderto increase competitivenessby integratingteams intopairsaccording to theirempathy,capacity and efficiencyis presented.The model canbe a useful toolin makingstrategicdecisionsforworld class companiesacross thecreativeandpracticalmodelingthat can be resolvedwithstructuredandfourth generationsoftwareGAMS(General AlgebraicModellingSystem)algorithms.The modelingcanbe extended tolarge-scale problemswith fabulousruntimesin polynomial time.Themodel is solvedin thefree version witha code whichis very efficientfor the simplicitythatis solvedabstractionof complexity.This modelcanbe usedby private andpublic institutionsseeking to achieveglobal competitivenessin times of globalization. Additionally you can use the linear programming model with free version Gams Software to try solving. It would be very economical and so easy to understand the provided information.

Key Words. Team, couples, task forces, optimization.

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Introduction

There are several definitionsofteam,forKaitzenbach(1993) is a group oftwo or more womenand / ormen withcomplementary skillscommittedtoa common goalfor a cause.Johnson(1987) states that a team consists oftwo or more womenor men whointeractand influence each otherwith specific rolesunder common rules. Shaster(1990) mentions that a working groupshould onlyserve the interestsof the organization.

Improvingadministrative systemsand services in manufacturing and services models. Public administration mustlead effortsto improvesystemsas one of theimportant tasksof working withcomputersin the organization,membersofa teamidentifyproblem areas, their causes analyzed andundergopreventive, corrective action andestablish standardsand / or proceduresi.e.membersgo throughthe process ofcomplex problem trying modelling, solving and simulation strategic decision making.
Workersandunion workersas well asgeneraland bureaucratsdo notseem to be satisfiedwith conventionaljobs wheretheir effortsaremeaninglessindividualism, are repetitive, withlow pay, they, without sayingthey want theirworkto understandareas suchhow to think, participate, decide, in their dailyworkdone. For this reasonit is important thatpublic administrationcanredesignworkfor their employeesand thusthey may feelthat their work hasvalue thatis importantabilitiesand expectationssharedwith all staffofthe workplace, people need to workyourmind, bodyand spiritto feelthat they are aliverevitalizing theirworkevery day andfeelthat this is abig reasonthatbeing inthis world toserve our community.HumbertoCantuin his bookdeveloping aquality culture(2002) Name somebenefits ofteamwork.

•Failures areless painfulandcelebratethe triumphscollectively

•Team membersmen and womenstrive toshow their skills

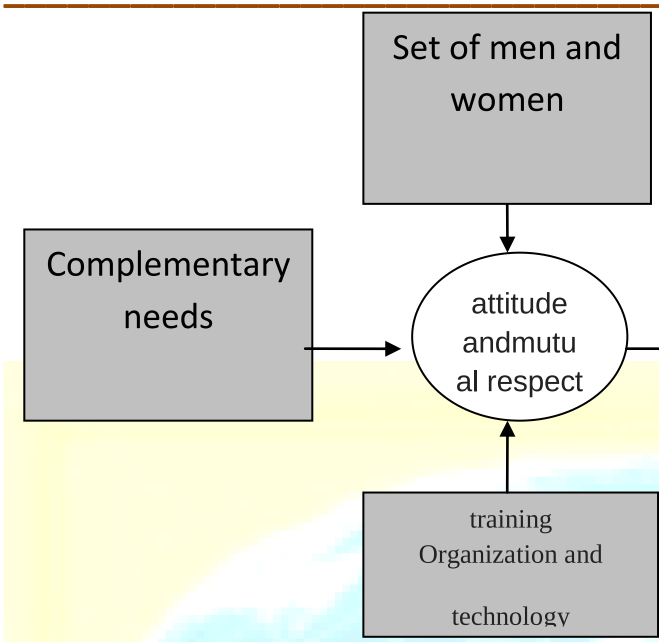
• Establishingprocessesforthe organizationto promotegender equityrequirementwhich isconsidered

•Information sharingenhances theselfof persons

•A sense of belongingis encouragedwiththe workplace

•The fairlink betweenwomen and men

• Collaborationand respectamong workers



Graph I. Zaragoza (2014)

Formation ofTask Forces.

Team buildingin public administrationwith a focus ongender can bebasedon the following criteria:

•menand womenworkersin the samedepartment

•women and menfrom different departmentsbut withcommon interests introubleshootingWorkers

• Women andmenintegrateddecision makingfor a temporarypurpose

• Men andwomen linkedto the same userin the servicesoffered inthe organization

• Men andwomen who jointo havecomplementary skills

• Menand women from differentwork areas,who haveempathyandinterest injoint negotiations

• Womenand trustedunionizeddifferenthierarchical levelwithseniority and experienceinanalyzing and solvingproblems intheir reliancemen.

Methodology.

Applicationof Selection ofa teamin Public Administration inside domestic undertaking. We haveninemen and women ina workplacesamplepairsof themwilling to worktogether, we use linear programming tomaximize the numberof teamstrained, organized and staffavailable Thenthematrixof employmentof staffofthe Division ofthe Secretariatof the dependentwomanState Executivewhich weregeneratedaccording toknowledge, experience andempathy betweenthe staff

Determinedthe process ofcustomer serviceand wasshownthesupportfortable II, below.

Personalnames	Carlos Hernández	Laura Léon	Ernesto Armas	Marco Tavera	Ayeixa Ibarra	Sandra Camacho	Carlos Tovar	Concepción Ponce	Manuel García
Carlos Hernández López	X	1	0	0	0	1	0	0	0
Laura León López	1	X	1	0	1	0	0	0	0
Ernesto Armas Castellanos	0	1	X	1	1	0	0	0	0
Marco Tavera	0	0	1	X	1	0	1	1	0
Ayeixa Ibarra	0	1	1	1	X	1	1	0	0
Sandra Camacho	1	0	0	0	1	X	1	0	0
Carlos Tovar	0	0	0	1	1	1	X	1	1
Concepción Ponce delgado	0	0	0	1	0	0	1	X	1
Manuel García Cuevas	0	0	0	0	0	0	1	1	X

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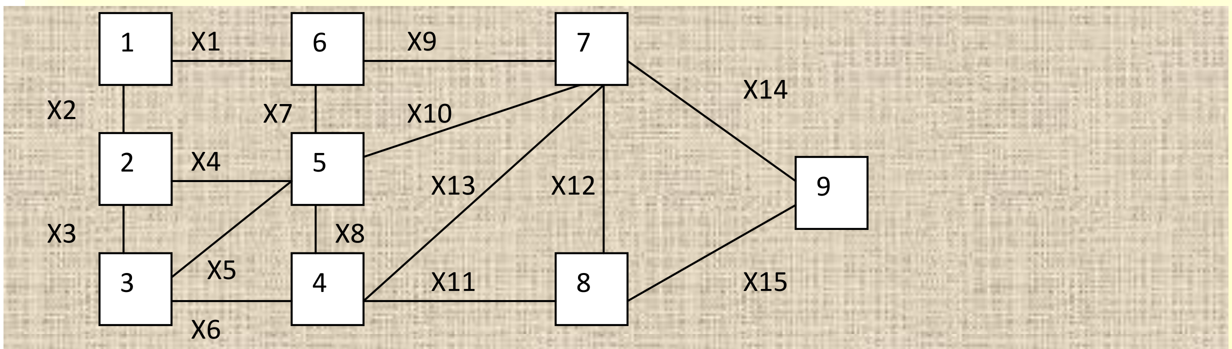
Table II.

The matrix showsthe relationship betweencompany employeeswhere the number one (1) determinesto be worked onbetweenthem because they can identified empathy, capacity and efficiency that they havewatched over timethey have worked before.Thecross indicates thatis not desiredemployment relationshipincludingthe lack ofany ofthe above mentioned features.



GraphII

(Graph of relationship between men andwomen)

Inthe graphnumber II; you can seethe relationships betweenstaffavailable wheretheir availability andinterest in sharingjoint effortsaremade manifest. It is very important to say that each variable represents a set of couples to integrate the working teams.

The proposedimplementationusing linearprogrammingmodelis as follows.

$$Max, x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9 + x_{10} + x_{11} + x_{12} + x_{13} + x_{14} + x_{15}$$

$$subject, to:$$

$$x_1 + x_2 <= 1, (node, 1)$$

$$x_2 + x_3 + x_4 <= 1, (node, 2)$$

$$x_3 + x_5 + x_6 <= 1, (node, 3)$$

$$x_6 + x_8 + x_{11} + x_{13} <= 1 (node, 4)$$

$$x_4 + x_5 + x_7 + x_8 + x_{10} <= 1 (node, 5)$$

$$x_1 + x_7 + x_9 <= 1 (node, 6)$$

$$x_9 + x_{10} + x_{12} + x_{13} + x_{14} <= 1 (node, 7)$$

$$x_{11} + x_{12} + x_{15} <= 1 (node, 8)$$

$$x_{14} + x_{15} <= 1 (node, 9)$$

Code in GAMS (General Algebraic Modelling Systems) free version
* * Solving linear model program
* Maximization of couples
* The problem try to maximize pairs of a group of people (men and women) in couples.
*Performance by Dr.Francisco Zaragoza Huerta
Sets
j / 1*15 /
i / 1*9/ ;
Parameters
B(i) / 1 1
2 1
3 1
4 1
5 1
6 1
7 1

8 1
9 1
/;
Parameters
C(j) / 1 1
2 1
3 1
4 1
5 1
6 1
7 1
8 1
9 1
10 1
11 1
12 1
13 1
14 1
15 1 /;
Variables
X(j),z
Binary variables
X(j) ;
table A(i,j)

You can see the continuation of the practical and innovative code in multicapacity version using General Algebraic Modelling Systems in academic version.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1	1	1													
2		1	1	1											
3			1		1	1									
4						1		1			1		1		
5				1	1		1	1		1					
6	1						1		1						
7									1	1		1	1	1	
8											1	1			1
9														1	1

Equations

fo Objective function

rest(i) constraint one;

fo .. z =e= sum (j, c(j)*x(j));

rest(i).. sum (j,A(i,j)*x(j))=L= b(i);

Model ejerc /all/;

Solve ejerc using MIP Maximizing z;

Experimental Results

---- VAR z

	Lower	Level	Upper	Marginal
1	.	.	1	**1**
2	.	**1**	1	**1**
3	.	.	1	**1**
4	.	.	1	**1**
5	.	**1**	1	**1**
6	.	.	1	**1**
7	.	.	1	**1**
8	.	.	1	**1**
9	.	**1**	1	**1**
10	.	.	1	**1**
11	.	.	1	**1**
12	.	.	1	**1**
13	.	.	1	**1**
14	.	.	1	**1**
15	.	1	**1**	**1**

S O L V E S U M M A R Y

Lower	Level	Upper	Marginal
-INF	**4.000**	INF	.

MODEL STATISTICS			
Block of Equations	2	Single Equations	10
Blocas of variables	2	Single Variables	16
Nonzero elements	46	Discrete Variables	15
Execution time = 0.030 SECONDS 4 Mb			

Conclusions.

From the results obtainedusing theGAMSsoftwareit can be concludedthat workersand workers shouldbe assignedto formteamsas follows:

Team oneworkereachworkerboth.Laura León with CarlosHernandez(x2)

Team number two working worker number three and worker number five. ErnestoArmas with Ayexa Ibarra (x5).

Team number three, worker number six with worker number seven. SandraCamachowith CarlosTovar (x9).

Team number four working worker number eight and worker number nine. ConcepcionPonce with ManuelGarcia(x15).

Laggingworker number four(MarcoTavera). Without assignmentto anyteam.

For the abovedescribedmaximumnumber oftwo-person teamsthat can be obtainedis fourteams, having groups composed of aman and a womanwhichis seen in theoutput correspondingresultsfor the variable "z" used in coding.

- You can see the execution time is in 0.030 seconds it is really amazing.
- The creative modelling using creative model results so easy to try using in private and public institutions.
- This class of implementation is the path to competitivenessand continuous improvement.
- The model was created to use to large scale optimization, you can see how you only need to raise the number of sub index and associated information.

Suggestions and recommendations.

- It is a great tool toachieveprofessionalizationin privateorpublicinstitutions.
- Itisconsideredway for opinion of workersto increasework environmentwithin the company
- Can be usedto reducethe perceptionof rigidityin the structureof organizations
- Thetool should be a part of methodology to link human resources, administration and industrial engineering.
- developsa feelingamong workers inthe organization ofthe companywhere they workusesscientifictools.

- This toolwill allowto reduce the gapofgender perspectivein the institutionsto achievegender equity.

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