Chapter–3

1.Simon'sModelofDecision-Making

HerbertSimonmadekeycontributionstoenhanceourunderstandingofthedecision-making process.Infact,hepioneeredthefieldofdecisionsupportsystems.Accordingto(Simon1960)and hislaterworkwith(Newell1972),decision-makingisaprocesswithdistinctstages.Hesuggestedf or thefirsttimethedecision-makingmodelofhumanbeings.Hismodelofdecision-makinghasthree stages:

•Intelligencewhichdealswiththeproblemidentificationandthedatacollectionontheproblem.
•Designwhichdealswiththegenerationofalternativesolutionstotheproblemathand.
•Choicewhichisselectingthe'best'solutionfromamongstthealternativesolutionsusingsome criterion.

ThefiguregivenbelowdepictsSimon'sdecision-makingmodelclearly.

IntelligencePhase

Thisisthefirststeptowardsthedecision-makingprocess.Inthisstepthedecision-maker identifies/detectstheproblem oropportunity.Aproblem inthemanagerialcontextisdetecting anythingthatisnotaccordingtotheplan,ruleorstandard.Anexampleofproblemisthedetection ofsuddenveryhighattritionforthepresentmonthbyaHRmanageramongworkers.Opportunity seekingontheotherhandistheidentificationofapromisingcircumstancethatmightleadtobetter results.Anexampleofidentificationofopportunityis-amarketingmanagergetstoknowthattwoof hiscompetitorswillshutdownoperations(demandbeingconstant)forsomereasoninthenextthr ee months,thismeansthathewillbeabletosellmoreinthemarket.

Thus,weseethateitherinthecaseofaproblemorforthepurposeofopportunityseekingthe decision-makingprocessisinitiatedandthefirststageistheclearunderstandingofthestimulusth at triggersthisprocess.Soifaproblem/opportunitytriggersthisprocessthenthefirststagedealswith thecompleteunderstandingoftheproblem/opportunity.Intelligencephaseofdecision-making processinvolves:
ProblemSearching:Forsearchingtheproblem,therealityoractualiscomparedtosomestandard s.
Differencesaremeasured&thedifferencesareevaluatedtodeterminewhetherthereisanyprobl em ornot.

Problem Formulation:Whentheproblem isidentified,thereisalwaysariskofsolvingthewrong problem.Inproblem formulation,establishingrelationswithsomeproblem solvedearlieroran analogyprovesquiteuseful.

DesignPhase

Designistheprocessofdesigningsolutionoutlinesfortheproblem.Alternativesolutionsare designedtosolvethesameproblem.Eachalternativesolutionisevaluatedaftergatheringdata aboutthesolution.Theevaluationisdoneonthebasicofcriteriatoidentifythepositiveandnegativ e aspectsofeachsolution.Quantitativetoolsandmodelsareusedtoarriveatthesesolutions.Atthis stagethesolutionsareonlyoutlinesofactualsolutionsandaremeantforanalysisoftheirsuitability alone.Alotofcreativityandinnovationisrequiredtodesignsolutions.

ChoicePhase

Itisthestageinwhichthepossiblesolutionsarecomparedagainstoneanothertofindoutthemost suitablesolution.The'best'solutionmaybeidentifiedusingquantitativetoolslikedecisiontree analysisorqualitativetoolslikethesixthinkinghatstechnique,forcefieldanalysis,etc.

Thisisnotaseasyasitsoundsbecauseeachsolutionpresentsascenarioandtheproblemitselfm ay havemultipleobjectivesmakingthechoiceprocessaverydifficultone.Alsouncertaintyaboutthe outcomesandscenariosmakethechoiceofasinglesolutiondifficult.

2.ComponentsofaDSS

FollowingarethecomponentsoftheDecisionSupportSystem−

- *DatabaseManagementSystem(DBMS)−Tosolveaproblemthenecessarydatamayco me frominternalorexternaldatabase.Inanorganization,internaldataaregeneratedbya system suchasTPSandMIS.Externaldatacomefrom avarietyofsourcessuchas newspapers,onlinedataservices,databases(financial,marketing,humanresources).*
- *ModelManagementSystem−Itstoresandaccessesmodelsthatmanagersusetomake decisions.Suchmodelsareusedfordesigningmanufacturingfacility,analyzingthefinan cial healthofanorganization,forecastingdemandofaproductorservice,etc.*
- *SupportTools−Supporttoolslikeonlinehelp;pullsdownmenus,userinterfaces,graphic al analysis,errorcorrectionmechanism,facilitatestheuserinteractionswiththesystem.*

3.Phasesofdecisionsmakingprocess

Decision-makingisacognitiveprocessthatresultsintheselectionofacourseofactionamong

severalalternativescenarios.

Decision-makingisadailyactivityforanyhumanbeing.Thereisnoexceptionaboutthat.Whenit comestobusinessorganizations,decision-makingisahabitandaprocessaswell.

Effectiveandsuccessfuldecisionsresultinprofits,whileunsuccessfulonescauselosses.There fore, corporatedecision-makingisthemostcriticalprocessinanyorganization.

Inadecision-makingprocess,wechooseonecourseofactionfromafewpossiblealternatives.In theprocessofdecision-making,wemayusemanytools,techniques,andperception

s.

Inaddition,wemaymakeourownprivatedecisionsormaypreferacollectivedecisio

n.

Usually,decision-makingishard.Majorityofcorporatedecisionsinvolvesomelevelofdissatisf action orconflictwithanotherparty.

Followingaretheimportantstepsofthedecision-makingprocess.Eachstepmaybesupportedb y differenttoolsandtechniques.

Step1−IdentificationofthePurposeoftheDecision

Inthisstep,theproblemisthoroughlyanalyzed.Thereareacoupleofquestionsoneshouldask whenitcomestoidentifyingthepurposeofthedecision.

- *Whatexactlyistheproblem?*
- *Whytheproblemshouldbesolved?*
- *Whoaretheaffectedpartiesoftheproblem?*
- *Doestheproblemhaveadeadlineoraspecifictime-line?*

Step2−InformationGathering

Aproblemofanorganizationwillhavemanystakeholders.Inaddition,therecanbedozensof

factorsinvolvedandaffectedbytheproblem.

Intheprocessofsolvingtheproblem,youwillhavetogatherasmuchasinformationrelatedtothe factorsandstakeholdersinvolvedintheproblem.Fortheprocessofinformationgathering,tools suchas'CheckSheets'canbeeffectivelyused.

Step3−PrinciplesforJudgingtheAlternatives

Inthisstep,thebaselinecriteriaforjudgingthealternativesshouldbesetup.Whenitcomesto definingthecriteria,organizationalgoalsaswellasthecorporatecultureshouldbetakeninto consideration.

Asanexample,profitisoneofthemainconcernsineverydecisionmakingprocess.Companies usuallydonotmakedecisionsthatreduceprofits,unlessitisanexceptionalcase.Likewise,base line principlesshouldbeidentifiedrelatedtotheprobleminhand.

Step4−BrainstormandAnalyzetheChoices

Forthisstep,brainstormingtolistdownalltheideasisthebestoption.Beforetheideageneration step,itisvitaltounderstandthecausesoftheproblemandprioritizationofcauses.

Forthis,youcanmakeuseofCause-and-EffectdiagramsandParetoCharttool.Cause-and-Eff ect diagramhelpsyoutoidentifyallpossiblecausesoftheproblemandParetocharthelpsyouto prioritizeandidentifythecauseswiththehighesteffect.

Then,youcanmoveongeneratingallpossiblesolutions(alternatives)fortheprobleminhand.

Step5−EvaluationofAlternatives

Useyourjudgmentprinciplesanddecision-makingcriteriatoevaluateeachalternative.Inthisst ep,
experienceandeffectivenessofthejudgmentprinciplescomeintoplay.Youneedtocompareeac h alternativefortheirpositivesandnegatives.

Step6−SelecttheBestAlternative

OnceyougothroughfromStep1toStep5,thisstepiseasy.Inaddition,theselectionofthebest alternativeisaninformeddecisionsinceyouhavealreadyfollowedamethodologytoderiveand selectthebestalternative.

Step7−Executethedecision

Convertyourdecisionintoaplanorasequenceofactivities.Executeyourplanbyyourselforwith thehelpofsubordinates.

Step8−EvaluatetheResults

Evaluatetheoutcomeofyourdecision.Seewhetherthereisanythingyoushouldlearnandthen correctinfuturedecisionmaking.Thisisoneofthebestpracticesthatwillimproveyourdecision

makingskills.

4.TypesOfDSS

DecisionSupportSystems(DSS)areaclassofcomputerizedinformationsystem thatsupport decision-makingactivities.DSSareinteractivecomputer-basedsystemsandsubsystemsinte ndedto helpdecisionmakersusecommunicationstechnologies,data,documents,knowledgeand/or modelstocompletedecisionprocesstasks.

Adecisionsupportsystemmaypresentinformationgraphicallyandmayincludeanexpertsyste m orartificialintelligence(AI).Itmaybeaimedatbusinessexecutivesorsomeothergroupof knowledgeworkers.

Typicalinformationthatadecisionsupportapplicationmightgatherandpresentwouldbe,(a) Accessingallinformationassets,includinglegacyandrelationaldatasources;(b)Comparative datafigures;(c)Projectedfiguresbasedonnewdataorassumptions;(d)Consequencesofdiffer ent decisionalternatives,givenpastexperienceinaspecificcontext.

ThereareanumberofDecisionSupportSystems.Thesecanbecategorizedintofivetypes:

Communication-drivenDSS
Mostcommunications-drivenDSSaretargettedatinternalteams,includingpartners.Itspurp ose aretohelpconductameeting,orforuserstocollaborate.Themostcommontechnologyusedto deploytheDSSisaweborclientserver.Examples:chatsandinstantmessagingsoftwares,onlin e collaborationandnet-meetingsystems.

Data-drivenDSS
Mostdata-drivenDSSaretargetedatmanagers,staffandalsoproduct/servicesuppliers.Itisu sed toqueryadatabaseordatawarehousetoseekspecificanswersforspecificpurposes.Itisdeploy ed viaamainframesystem,client/serverlink,orviatheweb.Examples:computer-baseddatabase s thathaveaquerysystemtocheck(includingtheincorporationofdatatoaddvaluetoexisting databases.

Document-drivenDSS
Document-drivenDSSaremorecommon,targetedatabroadbaseofusergroups.Thepurpose of suchaDSSistosearchwebpagesandfinddocumentsonaspecificsetofkeywordsorsearch terms.Theusualtechnologyusedtosetupsuch DSSareviatheweboraclient/serversystem. Examples:

Knowledge-drivenDSS:

Knowledge-drivenDSSsor'knowledgebase'aretheyareknown,areacatch-allcategorycoveri nga broadrangeofsystemscoveringuserswithintheorganizationsetingitup,butmayalsoinclude othersinteractingwiththeorganization-forexample,consumersofabusiness.Itisessentiallyus ed toprovidemanagementadviceortochooseproducts/services.Thetypicaldeploymenttechnol ogy usedtosetupsuchsystemscouldbeslient/serversystems,theweb,orsoftwarerunnungonstan d alonePCs.

Model-drivenDSS

Model-drivenDSSarecomplexsystemsthathelpanalysedecisionsorchoosebetweendiffere nt options.Theseareusedbymanagersandstaffmembersofabusiness,orpeoplewhointeractwit h theorganization,foranumberofpurposesdependingonhowthemodelissetup-scheduling, decisionanalysesetc.TheseDSSscanbedeployedviasoftware/hardwareinstand-alonePCs, client/serversystems,ortheweb.

5.PurposeofDecision-making

DecisionSupportSystemreferstoaclassofsystemswhichsupportintheprocessofdecisionmaki ng anddoesnotalwaysgiveadecisionitself.DecisionSupportSystems(DSS)areaspecificclassof computerizedinformationsystem thatsupports business and organizationaldecisionmaking activities.

AproperlydesignedDSSisaninteractivesoftwarebasedsystemintendedtohelpdecisionmaker s compileusefulinformationfromrawdata,documents,personalknowledge,and/orbusinessmo dels toidentifyandsolveproblemsandmakedecisions

DSSisanapplicationofHebertSimonmodel,asdiscussed,themodelhasthreephase

s: i)Intelligence

ii)Design

iii)Choice

TheDSSbasicallyhelpsintheinformationsystemintheintelligencephasewheretheobjectiveist o identifytheproblemandthengotothedesignphaseforsolution.Thechoiceofselectioncriteria variesfromproblemtoproblem.

Itistherefore,requiredtogothroughthesephasesagainandagaintillsatisfactorysolutionisfound .

Inthefollowingthreephasecycle,youmayuseinquiry,analysis,andmodelsandaccountingsyste

m tocometorationalsolution.

Thesesystemsarehelpfulwherethedecisionmakercallsforcomplexmanipulationofdataandus e ofseveralmethodstoreachanacceptablesolutionusingdifferentanalysisapproach.Thedecisio n supportsystem helpsinmakingadecisionandalsoinperformanceanalysis.DSScanbebuilt aroundtheruleincaseofprogrammabledecisionsituation.Therulesarenotfixedorpredetermine d andrequireseverytimetheusertogothroughthedecisionmakingcycleasindicatedinHerbert Simonmodel.

6.LevelsofProgrammability

Onthebasisofthepurposeofdecision-makingactivities,theorganizationaldecisionsaredivide d into3categories:

StrategicPlanningDecisions:Strategicplanningdecisionsarethosedecisionsinwhichthedecis ion makerdevelopsobjectivesandallocatesresourcestoachievetheseobjectives.Suchdecisions are takenbystrategicplanninglevel(toplevel)managers.

ManagementControlDecisions:Managementcontroldecisionsaretakenbymanagementcontr ol level(middlelevel)managersanddealwiththeuseofresourcesintheorganization.

OperationalControlDecisions:Operationalcontroldecisionsdealwiththeday-to-dayproblemst hat affecttheoperationoftheorganization.Thesedecisionsaretakenbythemanagersatoperational level(bottomlevel)oftheorganization.

Simononthebasisoflevelofthe programmabilityofadecision,proposedtwotypesofdecisions:

Programmed,alsoknownasstructureddecisions
Non-programmed,alsoknownasunstructureddecisions.

Programmed/StructuredDecisions

Programmedorstructuredarethosedecisions,whicharewelldefinedandsomespecifiedproced ure orsomedecisionrulemightbeappliedtoreachadecision.Suchdecisionsareroutineandrepetitiv e andrequirelittletimefordevelopingalternativesinthedesignphase.Programmedorstructured decisionshavetraditionallybeenmadethroughhabit,byoperatingproceduresorwithother acceptedtools.

Non-programmed/UnstructuredDecision

Decisions,whicharenotwelldefinedandhavenotpre-specifiedproceduresdecisionrulearekno wn asunstructuredornon-programmeddecisions.

7.KnowledgeofOutcomes

Anotherapproachofclassifyingdecisionsisthelevelofknowledgeofoutcomes.Anoutcomedefin es whatwillhappen,ifadecisionismadeorcourseofactiontaken.Whenthereismorethanone alternative,theknowledgeofoutcomebecomesimportant.Onthebasisofthelevelofknowledgeo

f outcomes,decision-makingcanbeclassifiedintothreecategories.

1.Decisionundercertainty:Decision-makingundercertaintytakesplacewhentheoutcomeofeach alternativeisfullyknown.Thereisonlyoneoutcomeforeachalternative.
2.Decisionunderrisk:Decision-makingunderriskoccurswhenthereisapossibilityofmultiple outcomesofeachalternativeandaprobabilityofoccurrencecanbeattachedtoeachoutcome.
3.Decisionunderuncertainty:Decision-makingunderuncertaintytakesplacewhentherearеanumb er ofoutcomesforeachalternative&theprobabilitiesoftheiroccurrencesarenotknown.

8.MethodsforChoosingAmongAlternatives

DynamicDecision-Making

Dynamicdecision-making(DDM)issynergeticdecision-makinginvolvinginterdependentsyste ms,in anenvironmentthatchangesovertimeeitherduetothepreviousactionsofthedecision-makeror duetoeventsthatareoutsideofthecontrolofthedecision-maker.

Thesedecision-makingsaremorecomplexandreal-time.

Dynamicdecision-makinginvolvesobservinghowpeopleusedtheirexperiencetocontrolthe system'sdynamicsandnotingdownthebestdecisionstakenthereon.

SensitivityAnalysis

Sensitivityanalysisisatechniqueusedfordistributingtheuncertaintyintheoutputofa mathematicalmodelorasystemtodifferentsourcesofuncertaintyinitsinputs.

Frombusinessdecisionperspective,thesensitivityanalysishelpsananalysttoidentifycostdriv ersas wellasotherquantitiestomakeaninformeddecision.Ifaparticularquantityhasnobearingona decisionorprediction,thentheconditionsrelatingtoquantitycouldbeeliminated,thussimplifyin g thedecisionmakingprocess.

Sensitivityanalysisalsohelpsinsomeothersituations,like−

- *Resourceoptimization*
- *Futuredatacollections*
- *Identifyingcriticalassumptions*
- *Tooptimizethetoleranceofmanufacturedparts*

StaticandDynamicModels

Staticmodels:

- Showthevalueofvariousattributesinabalancedsystem.
- Workbestinstaticsystems.
- Donottakeintoconsiderationthetime-basedvariances.
- Donotworkwellinreal-timesystemshowever,itmayworkinadynamicsystembeingin equilibrium
- Involvelessdata.
- Areeasytoanalyze.
- Producefasterresults.

Dynamicmodels−
- Considerthechangeindatavaluesovertime.
- Considereffectofsystembehaviorovertime.
- Re-calculateequationsastimechanges.
- Canbeappliedonlyindynamicsystems.

SimulationTechniques

Simulationisatechniquethatimitatestheoperationofareal-worldprocessorsystemovertime. Simulationtechniquescanbeusedtoassistmanagementdecisionmaking,whereanalytical methodsareeithernotavailableorcannotbeapplied.

Someofthetypicalbusinessproblemareaswheresimulationtechniquesareuseda

re− - Inventorycontrol
- Queuingproblem
- Productionplanning

OperationsResearchTechniques

OperationalResearch(OR)includesawiderangeofproblem-solvingtechniquesinvolvingvari ous advancedanalyticalmodelsandmethodsapplied.Ithelpsinefficientandimproveddecision making.

Itencompassestechniquessuchassimulation,mathematicaloptimization,queuingtheory,

stochastic-processmodels,econometricmethods,dataenvelopmentanalysis,neuralnetworks, expertsystems,decisionanalysis,andtheanalytichierarchyprocess.

ORtechniquesdescribeasystembyconstructingitsmathematicalmodels.

HeuristicProgramming

Heuristicprogrammingreferstoabranchofartificialintelligence.Itconsistsofprogramsthatare self-learninginnature.

However,theseprogramsarenotoptimalinnature,astheyareexperience-basedtechniquesfor problemsolving.

Mostbasicheuristicprogramswouldbebasedonpure'trial-error'methods.

Heuristicstakea'guess'approachtoproblemsolving,yieldinga'goodenough'answer,ratherth an findinga'bestpossible'solution.

GroupDecision-Making

Ingroupdecision-making,variousindividualsinagrouptakepartincollaborativedecision-making.

GroupDecisionSupportSystem (GDSS)isadecisionsupportsystem thatprovidessupportin decisionmakingbyagroupofpeople.Itfacilitatesthefreeflowandexchangeofideasand informationamongthegroupmembers.Decisionsaremadewithahigherdegreeofconsensus and agreementresultinginadramaticallyhigherlikelihoodofimplementation.

FollowingaretheavailabletypesofcomputerbasedGDSSs−

- *DecisionNetwork−Thistypehelpstheparticipantstocommunicatewitheachotherthrou gh anetworkorthroughacentraldatabase.Applicationsoftwaremayusecommonlyshare d modelstoprovidesupport.*
- *DecisionRoom−Participantsarelocatedatoneplace,i.e.thedecisionroom.Thepurpose ofthisistoenhanceparticipant'sinteractionsanddecision-makingwithinafixedperiodof timeusingafacilitator.*
- *Teleconferencing− Groups are composed ofmembers orsub groups thatare geographicallydispersed;teleconferencingprovidesinteractiveconnectionbetweent woor moredecisionrooms.Thisinteractionwillinvolvetransmissionofcomputerizedandaudi o visualinformation.*

9.DecisionTheory

Decisiontheoryisasetofconcepts,principles,toolsandtechniquesthathelpthedecisionmakeri

n
dealingwithcomplexdecisionproblemsunderuncertainty.Morespecifically,decisiontheoryde als withmethodsfordeterminingtheoptimalcourseofactionwhenanumberofalternativesare availableandtheirconsequencescannotbeforecastedwithcertainty.

AccordingtoDavidLewis(1974),"decisiontheory(atleastifweomitthefrills)isnotanesoteric science,howeverunfamiliaritmayseemtoanoutsider.Ratheritisasystematicexpositionofthe consequencesofcertainwell-chosenplatitudesaboutbelief,desire,preferenceandchoice.Itist he verycoreofourcommon-sensetheoryofpersons,dissectedoutandelegantlysystematized".

Intheoreticalliterature,itisrepresentedthatdecisiontheorysignifiesageneralizedapproachto decisionmaking.Itenablesthedecisionmakertoanalyzeasetofcomplexsituationswithmany alternativesandmanydifferentpossibleconsequencesandtoidentifyacourseofactionconsiste nt withthebasiceconomicandpsychologicaldesiresofthedecisionmaker.

Decisiontheoryproblemsarecategorizedbythefollowing:

1. *Adecisioncriterion*
2. *Alistofalternatives*
3. *Alistofpossiblefutureevents(statesofnature)*
4. *Payoffsassociatedwitheachcombinationofalternativesandevents*
5. *Thedegreeofcertaintyofpossiblefutureevents*

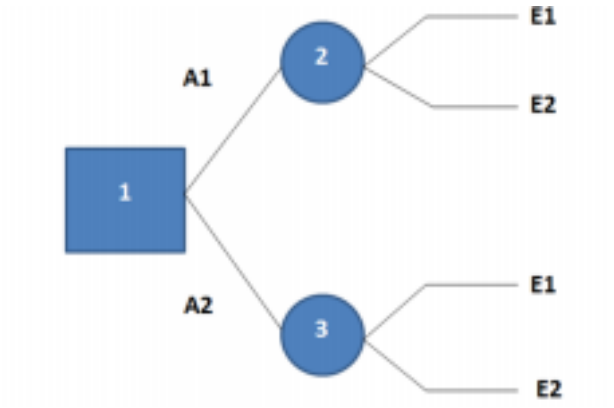
Therearetwocategoriesofdecisionstheoriesthatincludenormativeorprescriptivedecisionthe ory
toidentifythebestdecisiontotake,assuminganidealdecisionmakerwhoisfullyinformed,ableto computewithperfectaccuracy,andfullyrational.Thepracticalapplicationofthisprescriptive approachiscalleddecisionanalysis,andaimedatfindingtools,methodologiesandsoftwaretohe lp
peoplemakebetterdecisions.Themostsystematicandcomprehensivesoftwaretoolsdevelope din thiswayarecalleddecisionsupportsystems.

Incontrast,positiveordescriptivedecisiontheoryexplainobservedbehaviorsundertheassumpt ion
thatthedecision-makingagentsarebehavingundersomeconsistentrules.Theserulesmay,for instance,haveatechnicalframeworkoranaxiomaticframework,integrationtheVonNeumann Morgensternaxiomswithbehavioraldesecrationsoftheexpectedutilityhypothesis,ortheymay explicitlygiveafunctionalformfortime-inconsistentutilityfunctions.

10. DecisionTree,OptimizationTechniques

Decisionsinstages,decisiontrees:
Inmanyinstances,thechoiceofthebestactisnotmadeinonestage,andthedecisionproblem involvesasequenceofacts,events,acts,events.Theremaybeanumberofbasicalternatives,ea ch
leadingtooneofanumberofsituationsdependingontheoutcomeofacertainrandomprocess.At

eachsuchsituation,anumberofotheralternativesmaybeavailablewhichalsoleadtoanewsetof situationsdependingonanothersetofeventsandsoon,withactsfollowedbyevents,followedby acts,events.Discretedecisiontheoryproblemscanberepresentedpictoriallyusingdecisiontre ss.It chronicallyportraysthesequenceofactionsandeventsastheyunfolds.Inbelowfigure,square symbolprecedesthesetofactionsthatcanbetakenbydecisionmaker.Theroundnodeprecedes thesetofeventsorstatesofnaturethatcouldbeencounteredafterdecisionsismade.Thenodesa re connectedbybranches.



AnalysisofDecisionTrees:Afterthetreehasbeendrawn,itisscrutinizedfromrighttoleft.Theaimo f analysisistodeterminethebeststrategyofthedecisionmakerthatmeansanoptimalsequenceof thedecisions.Toanalyzeadecisiontree,managersmustknowadecisioncriterion,probabilitiest hat areassignedtoeachevent,andrevenuesandcostsforthedecisionalternativesandthechance eventsthatoccur.

Therearetwopossibilitiestohowtoincluderevenuesandcostsinadecisiontree.Onepossibilityis toassignthemonlytoterminatingnodeswheretheyareincludedintheconditionalvalueofthe decisioncriterionassociatedwiththedecisionsandeventsalongthepathfromthefirstpartofthe treetotheend.However,itcanbeappropriatetoassignrevenuesandcoststobranches.This reducestherequiredarithmeticforcalculatingthevaluesofthedecisioncriterionforterminating nodesandfocusesattentionontheparametersforsensitivityanalysis.

Whenanalyzingadecisiontree,managersmuststartattheendofthetreeandworkbackwards. Theyperformtwokindsofcalculations.

Forchanceeventnodesmanagerscalculatecertaintyequivalentsrelatedtotheeventsemanatin g fromthesenodes.Undertheassumptionthatthedecisionmakerhasaneutralattitudetowardrisk, certaintyequivalentofuncertainoutcomescanbereplacedbytheirexpectedvalue.Atdecision nodes,thealternativewiththebestexpectedvalueofthedecisioncriterionisselected.

BenefitsofDecisionTrees

Theyenabletoobtainavisualportrayalofsequentialdecisions,i.e.theypictureaseriesof chronologicaldecisions.Decisiontreeareuniversal,theymakemoreaccuratethestructureoft he decisionprocessandfacilitateacommunicationamongsolversofthedecisionproblem.Decisi on treeforcethedecisionmakertoappreciateallconsequencesofhisdecisions.Constructionand analysisofdecisiontreesbymeansofcomputersmakespossibletoexperimentwithdecisiontr ees andquicklytoestablishtheimpactofchangesintheinputparametersofthetreeonthechoiceof thebestpolicy.

Limitationsofdecisiontrees:

1. *Onlyonedecisioncriterioncanbeconsidered.*
2. *Thedecisiontreeisanabstractionandsimplificationoftherealproblem.Onlytheimportant decisionsandeventsareincluded.*
3. *Managerscannotusedecisiontreesifthechanceeventoutcomesarecontinuous.Instea d, theymustredefinetheoutcomessothatthereisafinitesetofpossibilities.*

Thesignificantresultoftheanalysisofadecisiontreeistochoosethebestalternativeinthefirst stageofthedecisionprocess.Afterthisstage,somechangesinthedecisionsituationscancome,a n additionalinformationcanbeobtained,andusually,itisessentialtoactualizethedecisiontreeand todetermineanewoptimalstrategy.Thisprocedureisrequiredbeforeeveryfurtherstage.