With Great Humor Comes  
Great Developer Engagement  
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ABSTRACT keyforcreativitysincethedawnofcivilization:humor.Humorous  
Theworldwidecollaborativeeffortforthecreationofsoftwareis softwarecodeisapowerfuldeterrenttoboredom.Itcanupliftthe  
technicallyandsociallydemanding.Themoreengageddevelopers moodofthedeveloperwhowritesit,aswellasapeer,separatedby  
are,themorevaluetheyimparttothesoftwaretheycreate.En- timeandspace,whochancesuponthisnuggetinthecodebase.For  
gageddevelopers,suchasMargaretHamiltonprogrammingApollo example,LeiaOrganaisasperfectasJohnDoeforaplaceholder  
11,cansucceedintacklingthemostdifficultengineeringtasks.In customernamewhiletestingane-commerceapplication.Agallery  
thispaper,wedivedeepintoanoriginalvectorofengagement– ofphotographscanserveasacheerfuljournaloftheWednesdays  
humor–andstudyhowitfuelsdeveloperengagement.First,we spenthackingawaywithacolleague.Softwaremayalsoactasa  
collectqualitativeandquantitativedataaboutthehumorousele- humorous,satiricalpieceonsocio-politicalissues.Inthispaper,we  
mentspresentwithinthreesignificant,real-worldsoftwareprojects: discoverthedifferentwaysinwhichsoftwarecanbeasourceof  
faker,whichhelpsdevelopersintroducehumorwithintheirtests; developeramusementandengagement,andhelpfosterasenseof  
lolcommits,whichcapturesaphotographaftereachcontribution communityamongthem.  
madebyadeveloper;andvolkswagen,anexerciseinsatire,which  
1 INTRODUCTION  
accidentallyledtotheinventionofanimpactfulsoftwaretool.Sec-  
ond,throughadevelopersurvey,wereceiveuniqueinsightsfrom  
125developers,whosharetheirreal-lifeexperienceswithhumor  
insoftware.  
Ouranalysisofthethreecasestudieshighlightstheprevalence  
ofhumorinsoftware,andunveilstheworldwidecommunityof  
developerswhoareenthusiasticaboutbothsoftwareandhumor.  
Wealsolearnaboutthecaveatsofhumorinsoftwarethroughthe  
valuable insights shared by our survey respondents. We report  
clearevidencethat,whenpracticedresponsibly,humorincreases  
developerengagementandsupportstheminaddressinghardengi-  
neeringandcognitivetasks.Themostactionablehighlightofour  
workisthatsoftwaretestsanddocumentationarethebestlocations  
Figure1:Comicstripsareclassicsinsoftwareengineering[1].  
incodetopracticehumor.  
Credits:xkcd.  
CCSCONCEPTS  
•Softwareanditsengineering→Programmingteams;•Social Thedevelopmentofhighqualitysoftwareiscertainlynolaughing  
andprofessionaltopics→Culturalcharacteristics. matter.Inadditiontocoretechnicalproblems,amajorchallenge  
ofsoftwareengineeringisitshighlycollaborativenature,which  
KEYWORDS requirescareandengagement.Toachievethis,differentorganiza-  
tionscreateacultureofengagementthroughvariouscorporate  
Humor,Developerengagement,Responsibility,Culture,Faking  
strategies.Forexample,OpenBSDdeveloperscelebrateeachmajor  
releasethroughanewsong1.BluechipSiliconValleycompany  
LAYABSTRACT StackOverflowchoreographedtheDanceDanceAuthentication  
Modernsoftwareapplicationsarebuiltpiecemeal.Theyarecom- scheme[2]ascompany-widesoftwaresecuritytraining.Guidelines  
posedofalargepoolofcontributionsmadebyindividualsoftware fororganizingreleasepartiesexistforcelebratingmajormilestones  
developers.Thesedevelopersspendlonghoursbrainstormingwith at Ubuntu 2, Fedora 3, and Debian 4. Across companies, devel-  
colleagues,solvingchallengingengineeringproblems,andwriting opercommunitiesthrivewithindedicatedonlinechannels[3]and  
code.Softwarecompaniesputdifferentstrategiesinplacetoengage throughthegamificationofthesoftwareengineeringprocess[4].  
theirdevelopersandsupportthemincopingwiththesehardtasks.  
Inparticular,someorganizationsandgroupsofdevelopersdecide 1https://www.openbsd.org/lyrics.html  
2https://wiki.ubuntu.com/BuildingCommunity/RunningReleaseParty/  
tonurturethecreativeandexpressiveaspectsofsoftwaredevelop-  
3https://docs.fedoraproject.org/en-US/mindshare-committee/events/release-parties/  
ment.Inthiswork,westudyauniversalhumantraitthathasbeen 4https://wiki.debian.org/ReleaseParty  
3202  
ceD  
4  
]ES.sc[  
1v08610.2132:viXra  
ICSESEIS’24,May2024,Lisbon,Portugal Tiwari,Toady,Monperrus,andBaudry  
Acrucialculturalphenomenonthatcomfortablypredatessoft- toverifythatthenewcodebehavesasexpected.Thenextstepisto  
warebyatleast35,000years[5]isthepracticeofhumor.Itspurpose committhesechangestotheproject.Finally,ourdeveloperpushes  
istoenchantandengageitsaudience[6,7],andfostercommunity- thiscommittotheremoteserverwheretheprojectresides.After  
building.Humorisfundamentaltothehumanexperience[8].Our peer-review,allproject-wideincomingcommitstriggerasequence  
enterprisingspecieshasincorporateditinmostofitscreativeun- ofeventswithintheContinuousIntegration(CI)pipeline.Themost  
dertakings,i.e.,ourspokenandwrittenword,ourart,andeven importanteventwithinthispipelineistorunthewholesuiteof  
traditionalengineering[9].Yet,tothebestofourknowledge,the testsintheproject.Onlyifthetestsuiteexecutessuccessfullyare  
interplayofhumorandsoftwareengineeringremainslargelyun- thenewchangesmergedintotheproject.Theprocessofcoding,  
exploredintheliterature. committing,testing,andintegratingisperpetual.Inthissection,  
Inthispaper,weunveilthephenomenonofdevelopersengaging weinvestigatehowhumorhasmadeitswayintoeverystepofthis  
withsoftwareengineeringthroughhumor.Westartwithcasestudy cycle.  
research,anddiscussthreeeminentexamplesofreal-worldhumor Weperformacasestudybasedresearch[17]andanalyzethree  
inopen-sourcesoftware:thefakerlibrarytogeneratenon-boring notable,open-sourcedevelopmenttools,whichintroducehumorin  
testdata,atoolcalledlolcommitsthatcaptivatesdeveloperswith tests(subsection2.1),commits(subsection2.2),andtheCI(subsec-  
selfies, and a parodic software tribute for making all tests pass tion2.3),respectively.Foreachoftheseprojects,wereportquantita-  
intheCI,aptlynamedvolkswagen.Wehighlightthehumorous tivedataaboutitscodebaseandcommunityengagement,aswellas  
elementswithineachoftheseprojectsthroughquantitativeand qualitativeinsightsfromourmanualanalysisoftheproject.Wealso  
qualitativeinsights.Next,weconductasurvey,invitingdevelopers gatherfirst-handaccountsofthesignificanceofthesehumorous  
tosharetheirpersonalpracticeof,andexperienceswith,humorin toolsfrominterviewswithdeveloperswhomaintainorusethem.  
thesoftwaretheycreate.  
Ourresultsdistinctlyshowthenuancesofhumorwithinsoft- 2.1 Testing:FakingItWhileMakingIt  
ware.Thefakerecosystemiscontinuallyevolvingthroughthenew  
Academicsaswellasindustrypractitionersunanimouslyagreethat  
humorousmaterialcontributedbyenthusiasts.lolcommitshas  
testingiscrucialtodevelopinghighqualitysoftware[18].Develop-  
beenahandytoolforfosteringcollaboration,celebratingachieve-  
erswriteteststoensurethatthefeaturestheyhaveimplemented  
ment,andreflectingonthepassageoftime.Inadditiontoajoke,the  
withintheirsystembehaveasexpected,andthattheintroduction  
softwareengineeringcommunityhasalsogainedausefultoolasa  
of new code does not introduce regressions. Each test contains  
side-effectof volkswagen.Overall,thecommunityofdevelopers  
componentscalledtestinputsthatbringthesystemtoatestable  
whoengagewiththehumorouselementswithintheseprojectsis  
state.Thisinvolvesinitializingvariablesorobjects,andsettingup  
remarkable.Furthermore,100ofthe125respondentsofoursurvey  
theresourcesrequiredforthetest,suchasadatabase.Testinputs  
testifiedtoexperiencinghumorwithinsoftware.Theysharetheir  
arerequiredtotrigger,andconsequentlyverify,differentsoftware  
valuableinsightsonpractisinghumorresponsibly[10],andwe  
behaviors,yetconstructinggoodtestinputsisknowntobechal-  
learnthathumorismostlikelytobefoundwithincodecomments  
lengingandtime-consuming[19].Asolutiontothisproblemisthe  
andtestinputs.  
useofdatageneratorsthatsynthesizerealistictestinputs,suchas  
Theworkmostcloselyrelatedtoouroriginalinquiryisabout  
acollectionofcustomercontactdetails.Thesedatageneratorsare  
teamcommunication[11,12].Therearerarestudiesonsoftware-  
packagedinso-calledfakinglibraries.fakeristhegoldstandard  
relatedhumor,suchasonEastereggs[13,14],andesolangs[15]. forfakinginRuby5.Itcontainsmorethan20,000linesofRuby  
Humorandcreativityarecloselyassociated,andthisalsoholds  
code,andasreportedinTable1,hasbeenstarredbymorethan  
forsoftwareengineering[16].Thenovelaspectofthisworkisits  
10,000usersonGitHub.Asofthiswriting,fakerprovides232  
focusonhumorinprogrammingandcode,reconcilingtherigorous  
objectgenerators.Eachofthesegeneratorshasmeticulouslybeen  
engineeringendeavourwithourhumaninclinationtowardshumor.  
documentedwithexamples.  
Wesummarizeourcontributionsasfollows.  
fakerprovidesaplethoraoffundamentaldatagenerators,such  
• Anexplorationofthediversefacetsofreal-worldhumorin asaddress,barcode,date,andlorem.Inadditiontoconventional  
softwareprojects. generators,the845contributorsoffakerhavedeemeditnecessary  
• Actionableknowledgefromdevelopersonhowtopractice toincludegeneratorsthatsupportdeveloperswithhumorousdata,  
humorintheirart,inordertocreateengagingdeveloper suchasalebowskiquotestringgenerator,orafunny\_namegen-  
communities. erator,toobtainBen ThairorDon Thattratherthantheboring  
Insection2,wedivedeepintothreeillustriousexamplesofhu- suspects,Jane DoeorJohn Doe.Theseextraordinarygenerators  
morinsoftwareengineering.Next,section3presentsthefirstever in faker refer to cultural elements such as movies, TV shows,  
surveytargetedtowardsunderstandinghumoristicdeveloperprac- music,videogames,sports,andbooks,amongothers.Forexam-  
tices.Wediscusspriorartonhumor-relatedsoftwareinsection4, ple,Faker::TvShows::Seinfeld.businessyieldsoneofthe23  
beforeconcludingthispieceinsection5. Seinfeld-relatedbusinessestablishments,suchasVandelayIndus-  
tries6.fakerismeanttobringjoytotestinputs.  
2 CASESTUDIESOFSOFTWAREDEVELOPER Inordertounderstandthishumorousaspectof faker,aswell  
asthetechnicalandcreativechallengesofmaintainingaprojectof  
ENGAGEMENTWITHHUMOR  
Onatypicalworkday,adeveloperwritescodetoimplementanew  
5https://rubygems.org/gems/faker  
feature,ortofixabug.Additionally,adiligentdeveloperwritestests 6https://github.com/faker-ruby/faker/blob/main/lib/locales/en/seinfeld.yml  
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Table1:Humorouscomponentswithinsoftwareprojectscancreatedeveloperengagement.Weillustratethisphenomenon  
throughthreepopular,open-sourceprojectsonGitHub:faker,lolcommits,andvolkswagen.Foreachproject,wehighlight  
thenumberofcontributors(#Contributors)andstargazers(#Stars),whichcapturequantitativeevidenceofdevelopers’  
engagementwiththeseprojectsonGitHub.IntheKeyFactrow,wereportproject-specificmetricsreflectingitsadmiration  
amongdevelopers.TheQuoteshavebeensourcedfromdeveloperforums,socialnetworks,andpersonalwebsites.  
faker lolcommits volkswagen  
#Contributors 845 57 13  
#Stars 10,882 4,606 12,716  
Gemdownloaded266,365times, Featured23times  
141funnydatagenerators  
KeyFact Multiplevideomontagesand astoptrendingonGitHub  
contributedby200developers  
galleries,e.g.,onYouTube between2015and2021  
“Iwillenablethisathomeformy “Iappreciatetheauthorofthislibrary  
“Ilovethefakergem.It’sso  
side-projects!ThisisreallyLOL. tonoend.Thereissomethingtobe  
usefulwhenyouwantto  
—daGrevisonHackerNews saidaboutsoftwarebeingmade  
populateadevdb."  
“I’vebeenrunninglolcommits injest."  
—xutopiaonReddit  
for10years[...]" —birdiesandersonHackerNews  
“LoveusingFakertopopulate  
—Mihai,blogpost “Mygod,thisishilarious"  
demoswith“real"contentvs.  
“IturnedonlolcommitssoI’dhave —clircleonHackerNews  
Quotes  
justusing[Lorem]Ipsum"  
arecordofmyworkingandkept “Thisisaworkofgenius.Bestlaugh  
—Ecstatic-Leader485onReddit  
hackingaway.lolcommitsis I’vehadallweek."  
“[Faker]isaworkofart"  
seriouslyunderrated[...]" —diatuonReddit  
—@lyloonTwitter/X  
—Evan,blogpost “Thispackageisstilloneofmy  
“PartofyourdailyRails  
“Thisisagreatidea-Iwonder favoritethingsontheinternet,  
testingdiet"  
[why]Ineverthoughtofit" ever."  
—Longjumping\_You\_1786onReddit  
—xmpironHackerNews —sensitive-earsonHackerNews  
thisstature,weinterviewedStefanniBrasil,acoremaintainerofthe andlocalesupport,andundergoesastringentreviewprocess.Good  
project.StefanniattributesthevibrancyandallureoffakertoMatz, fakesrepresentrealengineering.  
thecreatorofRuby.“Matzwantsprogrammerstobehappy."7Speak- Thecontinuousgrowthofthefakercodebasehasalsobeen  
ingaboutgeneratorcontributionstofaker,Stefanniremarked,“I asubjectofdiscussionamongdevelopers,whohavepreviously  
frequentlyreviewpullrequestsfrompeoplewhowanttoaddtheir beenconflictedaboutmovingabasicfamilyofgeneratorsintoa  
favoriteTVshow," suggestingtheemotionaldriverbehinddevel- faker-litegem9.Theycurrentlylackthedataonhowgenerators  
opercontributions.Indeed,throughmanualanalysis,wedetermine areusedinthewild,whichisnecessarytogroundtheselection  
thatatleast141ofthe232generatorsinfakermaybeconsidered ofasubsetofgeneratorsforfaker-lite.Stefanninotes,“Weonly  
unconventionalandhumorous.Overthe16yearsthatfakerhas seethenumberofdownloads,butwewouldreallyliketoknowhow  
beeninactivedevelopment,thesegeneratorshavegenerouslybeen developersusethegenerators.Manyoftheseusesmaybeinprivate  
contributedby200open-sourceenthusiasts.However,performance projects,sothereisnoeasywaytoknow."Besides,ashighlightedby  
andengineeringconstraintsmustbeconsideredbeforeaddinga adeveloperintheGitHubconversation,providingthefullsuiteof  
newgenerator8.Forthisreason,everycontributiontofakerfol- generatorsbydefaultfacilitatesaneasierintroductionoffuninto  
lowsatemplate,isaccompaniedbyrelevanttests,documentation, softwaretests.Infact,suchasplitcouldcomplicatethingsforusers.  
7https://youtu.be/oEkJvvGEtB4?t=1795  
8https://github.com/faker-ruby/faker/issues/2689 9https://github.com/faker-ruby/faker/issues/1539  
ICSESEIS’24,May2024,Lisbon,Portugal Tiwari,Toady,Monperrus,andBaudry  
1 seeder.create\_if\_none(Comment, num\_comments) do arguethattheacademiccommunitycangainfrompayingmore  
2 num\_comments.times do attentiontofakinglibrarieswithrespecttobothtestingandhumor.  
3 attributes = {  
4 # hashtag hella art party.  
5 body\_markdown: Faker::Hipster.paragraph( sentence\_count: 1), Summaryofthefakercasestudy  
6 ...  
7 } Hundredsofdevelopershavemadehumorouscontributionsto  
8 Comment.create!(attributes) fakinglibrariessuchasfaker.Humorhelpsfosteropen-source  
9 end  
collaborationbeyondcompanywalls.Withhumorousfaking,  
10 end  
11 ... software testers worldwide are treated with a nugget while  
12 seeder.create\_if\_none(Page) do debuggingafailingtest.  
13 5.times do  
14 Page.create!(  
15 # We need to override the haptic JBOD pixel!  
16 title: Faker::Hacker.say\_something\_smart, 2.2 Commits:LOLsAlltheWayDown  
17 ...  
18 # The wise animal blends into its surroundings. Acommitcanbeconsideredastheatomicunitofcontributiontoa  
19 description: Faker::Books::Dune.quote, softwareprojectmanagedbyaversioncontrolsystem.Acommit  
20 ...  
includes code changes, as well as a brief textual description of  
21 )  
22 end thechanges.Eachcommitmaybelikenedtothesnapshotofthe  
23 end projectatapointintime,andisuniquelyidentifiablethroughits  
Listing 1: The developers of the Forem project seed their hash.Asanexample,wecanconsidertheForemprojectdiscussed  
developmentdatabasewithsomehumorusingfaker. insubsection2.1.Withcommit944991a,aForemdeveloperhas  
implementedanewfeature,updatedrelatedtests,anddescribed  
thesechangeswithacommitmessage.  
Stefanniguaranteesthatthehumorousgeneratorswithinfaker Thenumberofcommitsmadebydevelopersgloballyonawork-  
aresafefortheforeseeablefuture. dayislikelytobeinthemillions[20].Giventhesignificanceofcom-  
WequeryGitHubtoinvestigatethereal-worldusageof faker mits,thereisanecosystemofutilitiesthataiddevelopersincom-  
inopen-sourceprojects.Onenotableclientofthefakerlibrary mitting.Forexample,commitmessagesmaybelintedtoensurethat  
is a project called Forem 10, which powers a social networking theyabidebyconventionswithcommitlint15.Thegit-secrets  
platformfordevelopers.Itusesfakertopopulateitsapplication 16toolscanscommitstopreventcredentialsandsecretsfromacci-  
anddatabasefortestexecution,suchaswiththefileseeds.rb.This dentallymakingtheirwayintotheprojectcodebase.Anewway  
filecalls10distinctgeneratorsoffaker.Weshowanexcerptofthis tocommitistoletgenerativeAIhandlethemessage,suchaswith  
fileinListing1,wherethedatabaseisbeingseededwithsomefake aicommits17oropencommit18.  
CommentsandPages.Severalattributesofthetwoentities,suchas Admittedly,commitsdrivesoftwaredevelopment.However,they  
thebody\_markdownofeachComment(line5),areproducedusing donothavetobemundane.gitmoji19servesasahandytoolfor  
fakergenerators.Thecommentsonlines4,15,and18aresample identifyingtherightemojiforacommitmessage,suchas:egg:  
outputsfromthethreeshowcasedgenerators.Notethatthetitle foracommitthataddsorupdatesanEasteregg.Anothercrowd  
ofeachPage(line16)couldeasilybeaFaker::Lorem.sentence. favoriteislolcommits,whichhasbeendownloadedupwardsof  
Instead,itissomethingsmartaHackerwouldsay11.Workingon 250,000timesasofAugust202320.lolcommitsisacommand-line  
softwareprojectsforherdayjobinaconsultancyfirm,Stefanni utility that captures a portrait of a single developer or a group  
sharedhowsheusesfakerfortesting.“Thegoodthingabouttesting ofdevelopers,andattachesittoeachcommitmadetoaproject.  
isthatwecanbecreative.Ioftenusecatnames.Butmyfavoriteis Table1presentssomedetailsonthelolcommitsproject.Nearly60  
theparks\_and\_recreationgenerator.Itismyfavoriteshow." developershavecontributedtoit,whilethenumberofstargazers  
fakerisonlyonememberofalargeandrichecosystemoffaking of lolcommitsismorethan4,600.  
libraries.ThePERLData::Fakermodule12isanessentialseedfor AsnotedonitsGitHubREADME,lolcommitswasoriginallya  
thisecosystem,whichshipswithonly6conventionalgenerators. “jokeproject"showcasedataHack&&Tellmeetup21,byitscreators  
faker,inspiredbyData::Faker,broughttheideaofhumorousgen- MatthewR.andMatthewH.Ithassincematured,andcannow  
erators,inadditiontotheconventionalonesportedfromPERL.This beinstalledoncomputersrunningallmajoroperatingsystems.  
gemeventuallytriggeredthedevelopmentofotherfakinglibraries, Whenenabledforaproject,lolcommitsaddsapost-commithook  
bothinRuby,suchasffaker13,aswellasinotherprogramming toits.gitfolder.Then,eachtimeacommitismade,lolcommits  
languages,includingJava,Python,PHP,JavaScript,Haskell,and triggersacapturefromthecamerainstalledonthedevice.Byde-  
evenC++.Remixingthedesignof faker,manyoftheselibraries fault,eachlolcommitincludesthefirst11charactersofthecommit  
offerdiversesetsofvanillaaswellasunconventionalgenerators.  
Forexample,java-faker14hasalsointroducedanewgenerator  
toproducequotesfromtheFrenchcomedyshowKaamelott.We 15https://github.com/conventional-changelog/commitlint  
16https://github.com/awslabs/git-secrets  
10https://github.com/forem/forem 17https://github.com/Nutlope/aicommits  
11https://github.com/faker-ruby/faker/blob/main/lib/locales/en/hacker.yml 18https://github.com/di-sukharev/opencommit  
12https://metacpan.org/pod/Data::Faker 19https://github.com/carloscuesta/gitmoji  
13https://github.com/ffaker/ffaker 20https://rubygems.org/gems/lolcommits/versions/0.16.3  
14https://github.com/DiUS/java-faker 21https://hackandtell.org/  
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things“funandlighthearted" whileworkingseriously.“Youcan  
poseforaphotowithyourcolleagues,becreative,evenuseprops.It  
isanimmediatecelebrationofyourwork!"Figure2presentsoneof  
thelolcommitsauthoredbySelenaandMichael,starringmany  
excitedparticipants.Theirownarchiveof lolcommitsfeatures  
several colleagues, amounts to 6.5 GB of disk space, and repre-  
sentsyearsofworkfulfilment.Theyaddthatincorporatinglive  
lolcommitsonstageduringtheirtalks“addsanelementoffunto  
ourextravagant,technicalpresentations."SelenaandMichaelalso  
sharetheirexperienceusinglolcommitswhileonaRailsCamp  
25,a52-hourexcursioninthewoodstopracticepair-programming.  
Theirgoalwastohaveatleastonesignificantcommitwitheachof  
the38participantsduringthecamp.Selenafoundthatlolcommits  
wasinstrumentalinthiscontext,“Weuseditforonboardingnew  
developers."Towardstheendofthecamp,mostpeoplewereexcited  
abouttakingpost-commitphotographs26.“Pair-programmingisa  
goodwaytounderstandhowpeoplework,andlolcommitswasthe  
Figure2:AcrowdenjoyinglolcommitsinApril,2023 cherryonthecake!"  
Summaryofthelolcommitscasestudy  
SHA,aswellasthecommitmessage,typedoutinmeme-likety-  
Developersmakemillionsofcommitseveryday.Introducing  
pography.Overthe12yearssinceitsinception,thecontributors  
humorthroughtoolssuchaslolcommitsisrewardingforde-  
tololcommitshaveconsistentlyprovidednewfeatures,including  
velopers,andcontributestoacelebrationoftheworkdone.In  
differentmodes,typography,andadditionalplugins.lolcommitsis  
additiontojournalingwithpersonalselfies,itfostersrelation-  
committedtodevelopers;italsosupportsthegenerationofvideos  
shipswithcolleaguesbyencouragingin-person,groupusies.  
andanimatedGIFs,whicharefeaturesmuchappreciatedbyitsuser  
base.  
lolcommitshasathrivingcommunity.Therearecreativevideo 2.3 CI:ButItWorksonMyCI  
montagesfeaturingthelolcommitsofdevelopersovertheyears Everysooften,alargecorporationreceivessomebadpress.Volk-  
22. Several developers also mention using lolcommits on their swagenmadeheadlinesin2015,whenitwasdiscoveredthatthey  
blogsandsocialpages.Wecontactedthreesuchardentusersof werenotcompletelyhonestabouttheirmanufacturedautomobiles.  
lolcommits.SelenaSmallandMichaelMilewskiarecolleagues Thesoftwareembeddedwithintheirdieselvehiclesreportedlower  
whopair-programtogether,givetalksinconferencesacrossthe emissionsofenvironmentalpollutants,specificallyduringtestses-  
world,andparticipateinhackathons.Theyoftenfeaturelolcommits sionsinthelaboratory[22].Thisdiscoveryhadsignificantconse-  
intheirprojectsandmentorshipmaterial.Theyalsololcommitlive quences,andkeydecisionsweremadesuchthatcarmanufacturers  
onstage,aspartoftheirtechnicaltalks23.EvanTraversisade-  
undergomorescrutiny.  
veloperwhohasusedlolcommitstodocumenthisprogresson TheVolkswagenstoryresonatedwithdeveloperswhoearnestly  
bothprofessionalandpersonalprojects.Speakingabouthowshe test their projects within Continuous Integration (CI) pipelines.  
startedusinglolcommits,Selenarecalled,“Aspairprogrammers, SomeenterprisingdeveloperssawtheVolkswagenheadlineasan  
MichaelandIconstantlyshareourideasandsetupwitheachother. opportunitytoimplementtheirowndefeatdevices.Suchadevice  
ThatishowIlearnedaboutlolcommits."Michaelontheotherhand cantinkerwithtestharnesses,trickingthemintobelievingthat  
happenedtobewalkingbywhenacolleagueathispreviousjob all tests in the test suite pass, thus circumventing the CI to re-  
wasmakingalolcommit.“Iaccidentallyfoundmyselfinalolcommit, turnthecovetedgreen:check\_mark:.Thefirstsoftwareprojectto  
andthoughtitwasreallyfun.Itworkssowell!" Evandiscovered achievethischallengingtechnicalfeatwasphpunit-vw,builtfor  
lolcommitstogetherwithhiscolleague,thedeveloperofaRuby PHPprojects27.Sincethen,suchdefeatdevicesfortheCIhavebeen  
gemforUrbanDictionary24.Weweresubscribedtoallnewsletters  
implementedacrossmultipleprogramminglanguages,including  
aboutRubygems.Oneofthemmentionedlolcommits. JavaScript,Rust,Ruby,Java,andevenC++28.Tocounterthese,  
Attachingaphototoacommitmayservemultiplepurposes. therealsoexistshoaxwagen,whichdetectsiftestresultsintheCI  
EvanrecountsachallengingdayatworktryingtosolveaHeisen- arebeingmanipulated29.  
bug[21]whichcausedabrokenbuild.“Itisnicetohaveavisual DevelopersKennethAuchenbergandThomasWatsonimple-  
journalofhowexcitedorfrustratedyoufelt.Whilewewereworking mentedvolkswageninJavaScript.DuringourinterviewwithThomas,  
onfixingthatevasivebug,lolcommitscapturedphotosofcolleagues  
lookingovermyshoulder,pointingatmyscreen.Wereflectedonthem 25https://rails.camp/  
overpizzas."MichaelandSelenabelievelolcommitscanhelpkeep 26https://github.com/failure-driven/blog/blob/master/content/rails-camp/commit-  
31-given-when-then-steps.md#lolcommit  
22https://youtu.be/mdzPI7Id840 27https://github.com/hugues-m/phpunit-vw  
23https://youtu.be/qCS1CYxOiEo?si=9kzesLgK3TNaCfi0 28https://github.com/WyriHaximus/awesome-volkswagen  
24https://rubygems.org/gems/urban/ 29https://github.com/CleanCode-Group/hoaxwagen  
ICSESEIS’24,May2024,Lisbon,Portugal Tiwari,Toady,Monperrus,andBaudry  
1const isCI = require('is-ci'); timesbetweenOctober2015andAugust202131,ashighlightedin  
Table1.“Itblewup!Kenneth,whoseGitHubprofilehostsvolkswagen,  
2// from arduino/arduino-ide  
3if (!isCI) { becamethetop-rankeddeveloperonGitHubwhileweweretrending  
4 console.log('Skipping notarization: not on CI'); forthefirsttime,"Thomasrecalled.Second,ittriggeredtheimple-  
5 return; mentationandreleaseoftheopen-sourcepackageis-ci,which  
6}  
7.............................................................................. respondstoanessentialCI/CDusecase,albeitthroughacomplex  
webofmonkeypatching.  
8// from salesforce/observable-membrane  
9if (!isCI) {  
10 console.error('This script is only meant to run in CI.'); Summaryofthevolkswagencasestudy  
11 process.exit(1);  
12}; Allcomponentsofsoftwaredevelopmentcanbethesubject  
13.............................................................................. ofhumor.Forexample,thousandsofdevelopershaveshareda  
jokeaboutcontinuousintegration.Softwaredevelopedpurely  
14// from videojs/video.js  
15const progress = () => { forfunmayevenleadtotheinceptionofatrulyimpactfultool,  
16 if (isCI) { suchasis-ci.  
17 return {};  
18 }  
19 return progressPlugin(); 2.4 TakeawaysfromtheCaseStudies  
20}  
Ourthreecasestudies,faker,lolcommits,andvolkswagen,high-  
Listing 2: The development of volkswagen triggered the  
lighttheintricaciesofhumorwithinsoftware.Throughfaker,we  
developmentofis-ci,whichhassincefoundlegitimateuse  
seethathumorcanbeincorporatedwithintestingtoengagede-  
cases.  
velopersandtesters.Thelolcommitsprojectgivesdevelopersthe  
opportunitytocelebratetheirdevelopmentjourney,andtheirongo-  
herecalled,“WewereinspiredbythePHPversion,andwantedtoseeif  
ingcollaborationwithcolleaguesinaplayfulmanner.volkswagen  
isadétournementofasocietalissue,unexpectedlyleadingtoapop-  
itcouldbedoneinJavaScript."Theyleverageatechniquecalledmon-  
ularandusefulopen-sourcepackage.Thecommunityofdevelopers  
keypatching,whichdynamicallymodifiesafunctionatruntime  
whoengagewithhumorouspracticeswithinsoftwaredevelopment  
[23].volkswagenhooksintoNodeandpatchestherequirefunc-  
islarge,toanextentwhichisnotknowninthesoftwareengineering  
tion.Thismodifiedrequirefunctionlinkstoaversionofthetest  
researchcommunity.  
framework,whichitselfismodifiedtoreturnasuccessfulexecution  
statusforalltests.Asasafeguard,volkswagenalsochecksthatthis  
3 DEVELOPERSURVEY  
monkeypatchingisactivatedonlyintheCI,andthatthebehavior  
ofthetestsisnotchangediftheyarerunlocally.Thomasclarified, Weconducttheveryfirstsurveyinthesoftwareengineeringlitera-  
“Onthesurfaceitmightseemeasy,butitisachallenge.Youhavetobe turefocusingonthepracticeofprofessionalhumorbydevelopers.  
awareofalltestingframeworks,andalsomakeitworkwiththewhole, Wehavedistributedaquestionnairethroughthemostactiveonline  
messyJavaScriptecosystem."Thefirstreleaseof volkswagenwas communitiesofdevelopers,andcollecteduniquequantitativeand  
“urgent,"beingrolledoutwithin24hoursafterdevelopmentstarted. qualitativegemsabouttheroleofhumorinsoftwaredevelopment.  
Currently,volkswagensupportsatleast18differentCIservers,and  
iscapableofinterceptingmultipleJavaScripttestingframeworks. 3.1 Methodology  
Thomasadmitsthatvolkswagenisameantasjoke,anddoes  
Thedevelopersurveyisbasedonanonlinequestionnaire.First,the  
notenvisionadirectusecaseforit.Yet,volkswagenisagoodcan-  
questionnaireintroducesthecontextwithexamplesofreal-world  
didateforatoolthatattacksthesupplychainbymakingtestspass,  
softwarehumor.Thisisfollowedbyquestionsaskingtheparticipant  
despitetheintroductionofmaliciouscode[24].Whileworking  
abouttheirresponseto,andexperienceswith,humorinsoftware.  
onvolkswagen,Thomasimplementedatoolcalledis-ci,which  
Thefinalsectionasksfordemographicinformation.Wepublishour  
identifiesiftheexecutionenvironmentisinfactaCIserver.He  
questionnaireonmultiplepublicchannelsforsoftwaredevelopers:  
releasedis-ciasanindependentpackageonthenpmregistry30.  
theAskHN forumonHackerNews[3],adeveloperchatgroupon  
Contrarytovolkswagen,is-ciisprofoundlyuseful.Wehighlight  
Discord,twodevelopergroupsonLinkedIn,and6communitieson  
three of the thousands of open-source usages of is-ci in List- Reddit,includingr/programminghumour.Additionally,weshare  
ing2.Thearduino-ideprojectfromarduino(lines2to6),and  
thequestionnairewiththedevelopersweinterviewedforthecase  
theobservable-membraneprojectfromsalesforce(lines8to12),  
studies.ThequestionnairewasreleasedonlineonAugust21,2023  
relyontheoutputof is-citoperformcertainactionsonlyduring  
andclosedafterfiveweeks.Oursupplementalpackageincludes  
executionontheCI.Conversely,thevideo.jsproject(lines14to thequestionnaire,allresponses,andfurtherdetails32.  
20)usesis-citoskipanoperationiftheexecutionenvironment  
Wereceived125responsesfromparticipantswhoseexperience  
istheCI.  
withsoftwaredevelopmentrangesfromlessthanayeartoupto40  
volkswagenhashadtwoworldwideeffects.First,itbecamea  
years.Theyworkacrossvariousdomains,suchassoftware,finance,  
projectofInternetfamewithitspurelyhumorousnature,having  
beenfeaturedonthedailylistoftop-trendingprojectsonGitHub23  
31https://github.com/larsbijl/trending\_archive  
30https://www.npmjs.com/package/is-ci 32https://doi.org/10.5281/zenodo.8386612  
WithGreatHumorComesGreatDeveloperEngagement ICSESEIS’24,May2024,Lisbon,Portugal  
Developersneedtowriteet.phone\_hometousethatfunc-  
tion,whichisstillfunnytome.  
Iincorporatehumorwithinlibrarynames.Onelibrary  
ensuredonlyoneprocessofaspecifictypewasalivein  
acluster.ItwasnamedHighlander,afterthemoviein  
whichonlyoneoftheimmortalswassupposedtostay  
alive...“Therecanbeonlyone."  
Theresponsesonoursurveyindicatethatdevelopersleverage  
humorouscodetobreathelifeintotheirsoftwareprojects.They  
favortestsanddocumentationforplacinghumor.Fromasocial  
perspective,manydevelopersadmirehumorouscodeauthoredby  
Figure3:Accordingtothesurveyrespondents,thepractice otherdevelopers.  
ofhumorinsoftwareisappropriatewithindocumentation, Finally,theastutereadernoticesthatwepreparedthebarchartof  
immediatelyfollowedbytestinputs. Figure3inxkcdfashionusingthededicatedmatplotlib.pyplot.xkcd  
module.Evidently,xkcdtranscendsthehumorouscomicstrips;itis  
asourceofinspirationfordeveloperstocreatehumorous,reusable  
communication,andhealth.Ofthe125participants,116(nearly softwarecomponentssuchasthislibrary.  
92.8%)writeorreviewcodeatleastonceaweek.  
The first question is about the reaction of the respondent to  
humorwithinsoftwaredevelopment.Morethan93%oftherespon-  
3.3 Humor,WhatisitisGoodFor?  
dents(117of125)saythattheywouldreactpositively,while8would  
beneutralornegative.Thisfullyconfirmsourcorehypothesisthat Thekeyhypothesisofourworkisthathumorisfundamentally  
humorisanimportantchannelfordeveloperengagement. goodinsoftwaredevelopment,toengageteamsinvolvedinhard  
engineeringwork.Oursurveyrespondentshighlightseveralcom-  
3.2 WhereDoesHumorBelonginCode? pellingreasonsforincludinghumorwithinsoftwaredevelopment.  
First,humorisoftentimesenjoyedforitsownsake.Developers  
Oneimportantgapinthebodyofknowledgeonsoftwarehumoris  
solvetechnicalchallengeseveryday,andhumorcanbebeacheer-  
aboutwhereitcanbepracticed.Oursurveycontainsadedicated  
sectionaboutthis.TheresultsareshowninFigure3,whichsumma-  
fulaid.Humorincode“helpskeepitfun,"sharesonedeveloper.  
rizesthetoplocationswithinsoftwareprojectswheredevelopers  
engagewithbothcodeandhumor.Ofthe100developerswhore- Humorshouldbethere.Itreallymakesmydayandmakes  
portedhavingpersonallyexperiencedsoftwarehumor,76saythat mesmile.Iloveitandthinkfondlyofpeoplewritingthat  
commentsanddocumentationarethebestlocationstounleash partofthecodeorcomment.  
it.Nextcomesaveryspecialplaceintheheartofsoftwarehumor  
practitioners:testinputs,with62participantsfindingitappealing  
Isometimeslistentoanalbumfromafriendwhichhas  
forhumor.Thisalignswiththefakercasestudyofsubsection2.1,  
somefuntracknames,like“CallbackHell"and“Merge  
showingthatculturalreferencesandfunquotesareappropriate  
Conflict."Itmakesmydaylighter.  
testdata.Indeed,severalparticipantsmentionfakerasoneofthe  
librariesthatprovidesthisopportunity. Second,humorpromotesasenseofcommunity.Forexample,  
oneparticipantrecallsfeelingconnectedto,andappreciativeof,past  
andcurrentcolleagueswhohaveauthoredhumoroustestinputs.  
Myhumorousdocumentationisfullyhandcrafted.  
Oneparticipantalsomentionsthathumorcanbeanice-breaker,  
especiallyforremotecollaborators.  
Iusetestdatatorunwildwithhumorsinceitdoesreallyfeel  
liketheplaceforit. It makes a codebase feel more humanized, like it was  
PerFigure3,twootherlocationsfortheintroductionofhumor createdbyarealperson.  
arewithinlogmessages,aswellasthenamesofcodeelements  
suchasvariable,classes,orfunctions.Onedevelopersharestheir  
MycatnamedBobshowedupinacallandacolleague  
favoriteexample,thephone\_homefunctionwithintheetmodule  
asked:“oh,sothat’stheBobCatI’veseeninthetests?"  
oftheErlangstandardlibrary33.Additionally,severaldevelopers  
LOL.  
mentionedotherways,outsideofcodeelements,forsharingajoke  
withacolleague:withincodereviewcommentsorinsideSlack Inadditiontothesepositiveeffects,humorcanhaveapractical  
channels. impactonsoftwaredevelopment.Forexample,humorintestcases  
can facilitate a common understanding of the test intention.  
33https://www.erlang.org/doc/man/et.html Funnystoriesthatareinventedandsharedamongcolleaguescreate  
ICSESEIS’24,May2024,Lisbon,Portugal Tiwari,Toady,Monperrus,andBaudry  
bondsthatarebeneficialwhenteamsfaceadversityatthesoftware Tosumup,oursurveyrespondentsofferactionableadvice,and  
factory. many aspects discussed here could readily be adapted to fit in  
the“CodeofConduct"or“Contributionguidelines"ofdeveloper  
Iincorporatesomethinglight(vsserious)tomakethings communities.Clearly,humorouscodeshouldberespectful,inline  
morefunandabiteasiertounderstand. withtheglobalsocialresponsibilitytheory[25].  
3.5 Summary  
Inventingpersonaswithinintegrationtestsseemstohave  
Ourthreecasestudiesandsurveyenableustoprovideguidelines  
rubbedoffinmyteamandwenowreferencethemwhen  
fordevelopersandmanagerswhowanttointroduceorencourage  
discussingthetestingapproachfornewfeatures.Ithelps  
humorwithintheirteam:  
lightenthemoodandmakesomeboringtasksabitfun.  
• Codecommentsareperfectforexpressinghumanityand  
Overall,oursurveyrespondentsconfirmthathumorisagood  
humor,withguaranteesthathumordoesnotimpactthefinal  
wayofincreasingdeveloperengagement.Humormakestheen-  
product.Forexample,thecommentsintheApollo11source  
gineeringprocessexciting,lightensthemood,promotesbonding,  
codeauthoredbyMargaretHamiltonandhercrewdidnot  
andmayevencontributetomoreunderstandablecode.  
preventasuccessfulmoonshot,asweseefromListing3.  
• Testinputsareappropriateforhumorouscreativityincode,  
anddeveloperscanrelyonstateoftheartopensourceli-  
3.4 ResponsibleHumor?  
brariestosupportthispracticeindifferenttechnicalstacks.  
Withgreathumor,comesgreatresponsibility.Developersbalance • Themorechallengingthedevelopmenttask,themoretech  
thebenefitsofhumorwithotheraspectsofprofessionalsoftware leadsshouldresorttohumorasafacilitatorofcommunica-  
development.Somerespondentsofoursurveyavoidincorporating tionandcollaboration,seeListing3.  
humorwithinsoftware,becausetheythinkthatitmaybedetri-  
mentaltoitsquality.  
Summaryofthedevelopersurvey  
Thedeveloperssurveyedacrossdifferentcontinentsanddo-  
Iactivelydiscouragemyteamsfromgettingcutebecause  
mainsadmittoexpressingabitofthemselvesthroughsoftware  
itoftenreducesreadabilityandknowledgetransfer.  
humor.Theyhighlightthataresponsiblepracticeofsoftware  
humordoesnotadverselyimpactcodequalityandthecommu-  
Addingextradependenciesforhumorwouldbeabigno nity.Theintroductionofhumorwithinsoftwaredocumentation  
forme. andtestsisanorganicwaytopositivelyengagedevelopers.  
Meanwhile,manydeveloperstakeamorenuancedapproachto  
humorwithinsoftware,andrecommendexercisingcautionwhen 4 RELATEDWORKONHUMORINSOFTWARE  
practisingit.Forexample,thelocationfortheintroductionofhumor  
Wenowdiscussrelatedformsofsoftwarehumorthatenchantall  
withincodeshouldbechosenwisely,consideringitsimpacton  
membersofsociety,andnotjustdevelopers.  
performanceandquality.  
SoftwareEasterEggs.Theyareoneoftheoldestformsofhumor  
insoftware[26].Thisformofsoftwarehumorconsistsofsmall  
Codefunctionalityshouldnotbeaffectedbyhumor,but  
piecesofcode,hiddendeepwithincommercialapplications,meant  
documentation or comments are a good place for that  
tobefunandsurprising.Overthedecades,Eastereggshavebeen  
wheneverappropriate.  
creativeinterludesfordevelopersandtrueenchantmentforusers.  
Today,itispossibletofindsoftwareEastereggsinallsectors[14],  
Iavoidwritinghumorouscodethatcouldbeexposedto fromvideogames[27]tocars[28],andwebbrowsers[13].The  
theenduser,andensurethatmyhumoroustestsarestill smoothacceptanceandthelongevityoftheeggrequireoperational  
straightforwardandreadable.Nojokesjustforthesake softwareengineeringexcellence[29].Inparticular,testingEaster  
ofjokes. eggs is notoriously hard [30]. Cacciotto and colleagues suggest  
thatEastereggsingraphicalinterfacesencouragesoftwaretesters  
Foraresponsiblepracticeofhumor,itisimportanttobemindful  
to explore rare behaviors of the interface [31]. Ruus evaluated  
oftheaudience.Humorshouldnothinderrespectfulcollabo-  
howtheKonamiEastereggcanbeusedtodetectcross-browser  
ration.Indeed,codereviewisimportantforriskmanagementin  
compatibilitybugs[32].Overall,thisliteratureshowsthatEaster  
humor,ashighlightedbyStefanni(cf.subsection2.1).“Iensurethat  
eggsarepositiveintakesthatfavortheengagementofdevelopers.  
nocontributiontofakerisoffensive,whichcanbehardtodowith  
HumorandSoftwareDevelopmentEducation.Variousstudieshave  
generatorslikesouth\_park."  
investigatedtherolethathumorcanplayineducation[33].Inpar-  
ticular,thesestudieslookathumortoengagestudentswithdifficult  
Humorinsoftwareprojects,especiallypop-cultureref-  
topics[34],orsubjectsperceivedasboring[35].Jonesdocumented  
erences,shouldonlybeincorporatedifyouarecautious  
thesocial,communication,andcognitivebenefitsofhumorinedu-  
anddiligent.Itshouldnotcreateatoxicorunwelcoming  
cation[35].Inrelationwithsoftware,Voglerandcolleagueshave  
culture.  
demonstratedthestronginteractionsbetweenlearningandhumor  
WithGreatHumorComesGreatDeveloperEngagement ICSESEIS’24,May2024,Lisbon,Portugal  
sectorsofmodernsociety.Humorpromotesasenseofcommunity  
# BURN, BABY, BURN -- MASTER IGNITION ROUTINE withincolleagues,andservesasanoutletforselfexpression.  
BANK 36  
Ourstudybarelyscratchesthesurfaceofdeveloperhumor,and  
SETLOC P40S  
BANK thereisyetmuchtounearth.Forexample,researchisneededto  
EBANK= WHICH studytheprevalenceofmemesinsoftwareengineering[50].We  
COUNT\* $$/P40  
haverecentlyreceivedagranttoinvestigatethedynamicsofhumor  
# THE MASTER IGNITION ROUTINE IS DESIGNED FOR USE BY THE specializationpersoftwarestack,groundedonpreliminaryresults  
# FOLLOWING LEM PROGRAMS: P12, P40, P42, P61, P63. onRust[51]andpastresearchonhumornichesinFrenchelite  
...  
# HONI SOIT QUI MAL Y PENSE education[52].  
...  
ACKNOWLEDGMENTS  
Listing3:ExcerptfromtheignitionroutineintheApollo  
11 code that sent humans to the moon. When Margaret We thank the interviewees, prolific humor and software practi-  
Hamilton and her crew developed the Apollo Guidance tioners:ThomasWatson,FaniaRaczinski,StefanniBrasil,Selena  
Computer,theywerealsofueledbyhumor[48].Software Small,MichaelMilewski,EvanTravers,andDawidDylowicz.We  
humorpredatestheinventionof“softwareengineering”as aredeeplygratefultoalltheparticipantsofoursurveyforsharing  
aconceptatthe1968NATOconference[49]. theirexperienceswithus.  
34https://github.com/DaviAMSilva/Rick-Rollette  
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