ci) product backlog (Breenking down Usere Storeies

as implienced sorthing bearing processing as implied User-1: I want to log in securcely so that I can access my account:

- -> User authentication (Email/passworld)
- > 0 Auth fore third party login ( Google, Facebook)
- -> enclayed user credential and stored instrud safely, a whole marriages pristableness
  - -> 585510n management
  - -> Erercore hundeling fore incorrect login
  - -> Unit and integration test
- -> security test (591 injection, brante force STOREST STREET SOLD SOLD MINES &

Userc-2: I want to search Products by category to find vitems easily wide and minds

-> beartch bart UI

-> product category -> a sentich API Fore fetch product based

on catogoray

- -> optimize dulabase quaircies forcefficient searching
- -> Implement sorting feature (price, realing en
- -> mobile responsiveness
- -> Unit and integreation testing
- -> Usability testing.
- (ii) In spraint meeting team can praioraitize considering customere value and technical feasability

#### Customera Value:

- -> login needs fore usere access, which Is high praiorcity.
- -> search improved user expercience, is low praioraty.

## Technical fousability:

-> login needs fore security which needs morce efforce.

of search needs fore dutubase quirces.

#### spraint praioraitization:

- 1) User I storey should be completed firest with high preiorcity
- 2) parcullely users 2 storry can be completed with low preloreity.

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methodology Cità decise de la catala de la capación de da per Cistà

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incomment approach method and me scum boured:

Entrone

collected receivers. Task Topo Do In progras Done of Design Login UI sall a positional User authentication CEmail / pussworld delivery sefficiently property O Auth for third party login ( Google, clesione face book) Design seurceh bareuI 26331 1613(123) prioduct cutegory Spark Hamile Filten 6 Donbing a bentach aptoliostali 124111267

methodologies address trisk management and adaptibility

		0401 MIO
3 pircal	Agile	Extreme metholology
trisk draven approach focus on raisk unalysis	incremental approach focus on customers collaborzation, Softwaite, changes. Freumework like Scream, kanhan allow teams to delivers softwarte in short cycle called spreints.	focus on  paire preogramming  TODI Test  ditiven Devielop- ment,  continious  integration.
manage raisks by raisk assessment on which need repercience d ensonner	mange rask by continuous integreation testing and into itercation	munge raisk by automated testing continion integration.

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		high	medina	me win m	

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Issues Reluted to professional Responsibility.

- 1) securcity Risks: Cybercaltacks.
- 2) prairacy violation: misuse of personal data
- 3) Algorithmic blus: Developing softwaree that discraminates based on reace, gender on other factors.
- 4) Intellectual property theft: wing unauthorised code our software components,
- conses horror
  - b) whistle blowing Reporting unethical practices in an oraganization.

ACMITEE code of Ethics and Ethical
Decision - Making:

KOROBELK

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- 1) public Intercest and well being
- 2) Monesty and Integraty
  - 3) faireness and equity
  - 1) confidentiality and pravacy
  - 5) professional competence and Responsibility

project becomes frigade persons a trass

Functional requirements:

- 1) Userc authentication and authorazation
- -> userce must login securcely using cradentals restitution: enhances securaty
- 2) Flight search and Booking
  - -7 user cable to search feights based on dute, destination and aircline

contrabation improves a wability is (

3) payment precessing:

-> mutiple parment options (credit) debit carres, parpal, digital wallets)

and user surisfaction

1) sent selection & reservation

seats and modify booking beforce departurce

contrabution: usability and fleribility

5) Real time Notifications and apartes.

John Thooking confirmation, flight delays

contrabution: improves user expercience

Non-functional requirements to takent (

1) periformance and scalability

2) securaity and duta protection

3) usubility and assessibility of miles

1) availability and raliability

main tainability and modulataity

## v-model in software testing:

v-model is a plan draiven software development Laborer preisoner or contract product

#### Key phuses:

- Ame sufficience in checkles, leaved and 1) requirements unulysis -> Acceptence testing tuting bists on use
- 2) 575tem Design ->545tem testing
- 3) Architecture besign -> Integration testing

Lavarita ()

- 1) Module Design -> Unit testing
- 3) PLECTOLIDE DESENDEN 5) Implementation - vouit testing

## Bernefits:

Collection ? -> ensurces early testing and eurly · 3 1 1 16 28 defect detection.

+ ) fastely livery to maintain (+

- 1 provides a structured approach
- -7 improves 575+ em Unulity toward to be legated

## prototyping in software engineering.

protyping is an iterrative development approach where a working model of the software is creented, tested and painted arman and a sier hours of mure has man tretimes bused on user feedbage.

Coste lite.

### Ver stages:

- 1) tepuircements gathering.
- 2) prototype Development
- 3) User Feedback
- 1) refinement
- 5) iterculton

#### of emperies early testing and entery Benefits:

- 1) user Feedbulk
- 2) Risk Reduction 3) itercative Development
  - 4) fastote time to matchet.

ver stages: 1 conscion out estimate (2 1) planning: Define goals and gather buseline

culenceled beeting

- 2) Analysis: identify bottlenecks and arreas fore iron preovement
- (MIN) I spain (tis minor of ilidages) 3) improvement: implement solutions and process changes.
  - 4) control. Monitor and ensure the sustainability of improvements
- 5) Feedbulk and itercution use duta to itercate and further refine the prices sod ba burn

common process metraces of states

1) De fect Density Mensurus defects permunit of 2) (rule time theme to compute a piece of work

5) velocity: Tracks the amount of work completed per iteration

various great mot

course been grossoulled effects dievlorse (s

#### SEI capability Maturcity model (CMM) ilas trumpulgari : tamavas igrarica

The cam is a freamework that helps oxegaritation assess and improve their software development processes through 5 muturally levels: 9) Fredward and itereation

Duvell' intial - process are unpreductante and ad hoc

2) level 2: Munnaged: Busic Prosect

monnagement practices are established for better predictorbility

a ofece of worker

3) level 3: Defined - standaretited and Joenmented precieves are applied acteons the oreganitation.

1) level 4. Onem titatively managed. Processes

are mensured and controlled using

duta-draven metrices

5) level-5: Optimiting

continuous priocess impriorement is focused on innovation and optimization.

modigines of 100 a contabat by slaged \*

Agile principle! Made and manage and made

- Deustomer Collaboration focus on
  - 2) Responding to change: adapt to changes Quickly.
  - 3) Individuals and Intercactions: emphasite teamwork.

1) working software: praiotahire functionne software over documentation pasioning bother words

nother imageria 2/14

## Agile in Envirconments:

\* startups: fast, flexible iteraction.

is horamicion borns borns borns of oring -7 Benefints: Speed

periorism assiss 6 - while of Challenges: limited tresources

poisinging : 2-1910 (3 \* Enterphises: scaled Frameworks (SAFe/Less) Benefits: coordination.

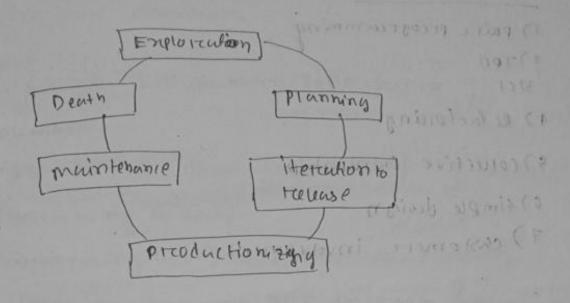
charlenges: complexity.

\* Regulated Industries: adapt to compilance. Benefits continions feedback

challenges: Balancing agility and tegulation customes, teeppiece

2) Responding to enemye. adopt to enemyes

mollowers and Intermediate somplime site terrandones



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Set Convenient !

xp telease trule

Delunning : Autree on feature

(1)

- 2) Internation Develop in shorte (4(les (1-3 weeks)
- 3) Development: write, test, interreate code continionsly
- and adjust preionities
  - 9) Release
  - 6) Rettrog pective

Key Xp preactices: 1) paire preogramming 2) TOD 3) (1 4) Refactoring 5) coluctive ownership 6) simple design 7) constonere involvement 12 JAN - 9 200 1971 94 Memberz BOOK BOOK JD printra 100 Memberso o to shore cheles title Authon CONSTRUCT membershippula 100 100 1 15 ISBN 1000 9019240 (8 BOITHOWING overdue Book activity catalog. brendueIn ID Port amount Dura Oxendue Due outer 4ini 4 3 (23135) (2 M BOTTOWER BOOK 6 3 TREPEROR DECEMBE 200k ID BennowingIP

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2) BOOK - BOTH TOWING activity (1:N)

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cuterced Arcchitechturce for online Judge

1) præsentation luyers:

-> tresponsibilities: user intercluces forz

intercacting with the system.

Tech: HTML, (55, Javascraip + ( React, Angulare)

19 243 949

2) Application larter:

Responsibilities: manages API taquets, authentication and communication between VI and business logic.

tech: nest APIS, JWT authentication.

3) Business logic larer. Isholigona!

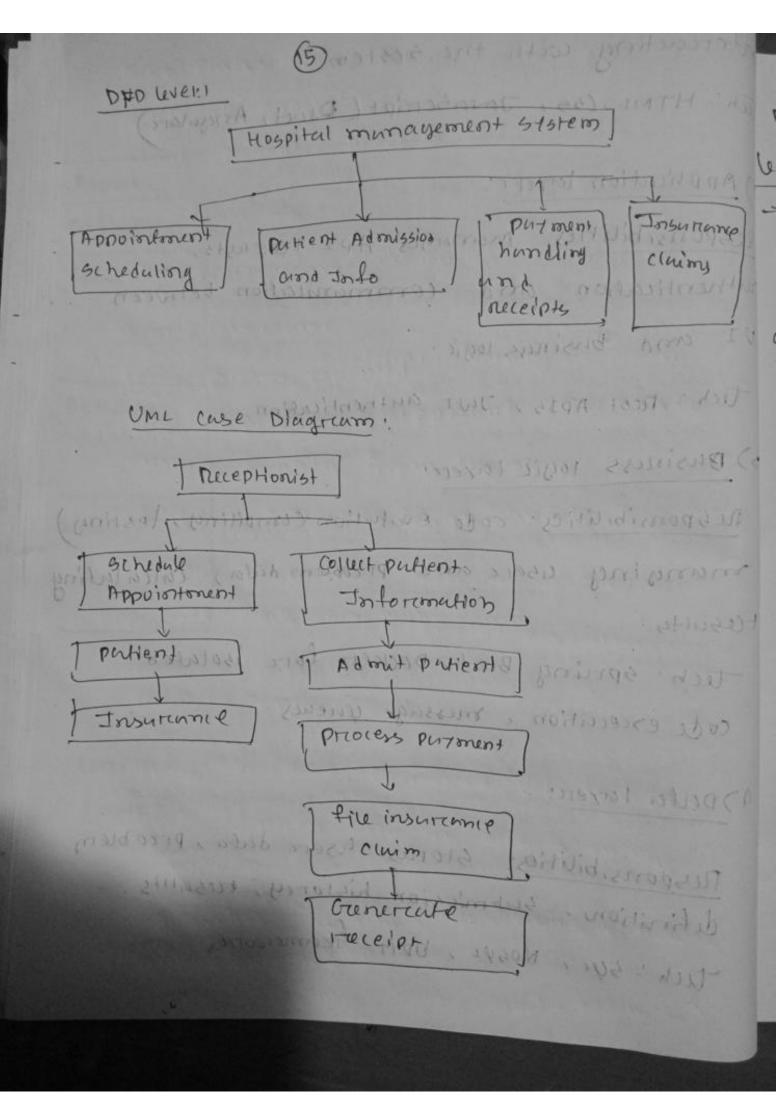
Responsibilities: code evalution (compiling, testing)
munging users and problem duta, culculating
tosuits.

tech spring Boot, Docketa fore isolated ? code execution, message queues

1) Duta layere:

definition. Submission historry, tresults.

The Sylin NOSYL, DEM Frameworks.



DIO fore Hospital Management System a harrist horage A . Walkers Levelo (content Diagram) -> Entitles: patient, Receptionist, Flow. patient interacts with receptionist for appointments and info. Succession States · neceptionist communicates with the Hospital Statem and Dutubuses. (ever 1 (54 5575 + me) with most collins some · preofesses fill is a release economy - estruma

Appointment scheduling , patient admission, parment hundeling.

· Frow. Exach preocess interents with the ( Wallty Continol ( U) dutabase.

UMI use case Diagram ( Receiption module)

art is chapted you bord official it want · Actors · Nocephionist , patient , Inburgance provider: and saguel , prides isitività.

Widows Stanton 2003 2 1 100 C ) 4105 1

schedule, Appointment, collect info,
admit patient, process payment.



## quality assureance is quality Control

#### quality assurance

Focus es precess oriented maniers level 19331.

ensurce quality from the state

I'm best allower terior

· Activities · Process design, audits

· Tools : Agile, sin stymu, lenning, adjuster

# quality control (40)

focus: Preoduct - orciented (detects defocts).

· brown: Identify and fix defects in the
final preoduct.

· Activities: Testing, inspection, validation, nature: nearlist

Tools: Testing tools (Dunit, Selenium)

Role of PA in Each SDIC Phase.

Drequitements trathering:

complete and testable.

Activity: Analyzed and validate treprintements

2) 575+Em Design

· Role: Ensure design aligns with.

tequirements and is testable.

· Activity: Review design, proporto test plans

3) Development: Holong do bacon donningo

early testing.

Activity: Develop test cases, percforces code treviews, Static analysis.

· pole: varidate that the software meets

requirements and identify defacts.

· Activity : execute test, teporet bugs and conduct feedback loops.

#### 9) Deployment:

· Pole : Erisure Stuble deployment and tendiness fore preodultor.

Process.

ACHVITY: conduct UAT, verify deployment

. Bon Esteerin desido anidad.

RAD ( Rapid Application Development Model):

is a fast, Hercactive software development.

approach focused on prototypes, asers
feedback, parcailler development.

#### Key phuses:

- nepuircement phases: Define ray wirtements
  - 2) Usera Design: Cracate and taline prototypes
    - Parallel development.

4)(

Ph.

, b.

Maritagy Hom

A) intover: final testing and deployment

· prestotyping and users Involvement.

· Itercative Development and time boxed phase · component news of the state o

#### Advuntages.

tail - 1312 - way magner · Fastere delivercy, fleribility and cost efficiency · High users sulisfaction through continion feedback. Private UST & Straing > Scrippor

issue detection esurces quality · Early f ( seasoner being ) alternal pion or might

Conscious phis trighties

## white Box Testing (Java)

The RAD approaches focus on testing key. decision points like if, else if and for loops In the provided code.

	7	The said	Expectedoutput
Decision	2 input	4 in put	
Decision	No. 1	6	"715 terro"
4==0	Any	- Ant was al	11 x is 7010."
X == 0	0		Numbery divisible
	Positive	8031.	4.3011
[000(12=x)	Positive	lutagenthan 4	No output
1000 (ic=n)		11111	or output
12000 (it = n >	Negative	1 609114F	
1000 (ic=x)	Negative	Positive	00000000

# Junit Test class:

import original Jupiter api Before Each;
import original Jupiter api Test;
import stuff original Jupiter api Assertions \*;
import Java util Arcray list;
import Java util List;

cluses Decision list of

Private List & Straing > Owtput;

output add (mussage);

recivate void process (in+x, in+y)

Pristin( 117 15 terro"); 4

Prainting (" n is teno");

for lint i=1; i(=); (++)) 1200 13 if (1010 4 = = 0) f agreen property that property printin ( Integer - tostring (i)); ( B) (1) assettle from of content, list of (cos)); for public word test-coape-crose-1-menorinely 60 Beforce Euch 81 colos/ 5, 2)3. Plabul Void Setupuly Output = rew Archarlister(); (1) (a) Test 1-20 (V) Public Void test- yis-zercol) & har lead him many Process (5,0); assert Equals (output, List of (117 is terro")); } 10 Test Public void text-x-is-Zeno()} 1/3/ PHOLESS (013); assert Equais (output, List of ("x is terro")); 4 aftest prentimed grangement provided printent time public void text-100p-does-not-truncit proces(0,2); anera Epunis (output, List of())); 9

public void test-numbers: divisible-by-y() }
process (413);
ausptut Equals ( butput, List of ("3")); }

Ortest

public void test-edge-(use-y-negativel);

process (5,-2);

assert Equals (output, List of ("2", "4")); b

public void test\_edge-case-xerregative()}

process (-3,2));

assert Equals Coutput, List of ()); 4

21

Junit 4 allows forz effective black-bon unit testing using enception hundring, etup factions and timeout reales.

Carcia Edmine Combon 1 1th of (1) ); &

4019 1038- X-13- 36100

## 1) Exception Hundling:

methods throw exceptions under specific
conditions.

2) setup Function:
use 60 Before to set up objects ore prepare
the envirconment before each test

#### 3) Timeout Rule:

Use Expule with timeout to limit test execution time.

Threead steep (1000)

## prioduction code (cakulaton).

public class calculatored

public int divide (int a, int b) d

if (b==0) throw new Arathmetic Exception ("connor L

divide by zerro");

theturen alb;

public String getarreeting (3tring Name 1 + (num== null) throw new thrownew Illegal Arzgument Enception ("Name connot be Null"); teeturen "Hello," + name; & Public int long Running Method () throws Interitupted Exception of Threead : sleep (1000); noi teturen 12; thail of thouast ation wing () eduction code (conculator) Jurit Test class: import orcy. Junit. Before; Isosport orco. Justit test; " toil shill al import ones Durit Ral; import ong. Durn't . trules . Tisseout jest de Mini

Import stute orcs. Just - ASSETU. \*) de montes

Prisato calculator calculators;

Public void setapl) }

Carcarators = new carcarators(); 9

Public void test Divided By Ferroling (100)

Culculators. divide (10,0); 6

Dublic Void test Divide() horason (divide (1012))), y

Ottest (empected = Illegal Artigument Exception (lay)

public void testarteeting With Null Name () {

Calculatore Get Getteeting (mull); 9

public void test Gerceeting() }

oussetch Ephans ("Hello, John", Calculator,

get arcuting ("John").

public Timeout global Timeout = Timeout. Seconds(2)

Debut void test Long Punning Method ().

Public void test Long Punning Method ()

throws Interrupted Enception?

Asserct Equals (42, carculaton, long Punning Method ()

Exception Hundling: test it methods throw expected exceptions.

the test envirconments

Within a specific time limit.

Michaelon Getarcuting (man); 9

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MADELL NOIS TEST CELECTION JOHN", CARCALLAND CONSTRUCTION JOHN", CARCALLAND CONSTRUCTION JOHN CHESTING CHESTING

Supply Lies Room = Lixusing