

## **Human Computer Interaction (Hindi mein)**

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### **Human-Computer Interaction (HCI) ka parichay: Vyakhyan 1, Bhaag 3**

#### **Lec03**

Namaskar Human Computer Interaction jo ki is baar hum Hindi bhaasha mein padhane ja rahe hain usmein aapka fir se swagat hai aur pehle hum ek bahut tezi se ek punaravriti kar lete hain. Abhi tak humne jo cover kiya hai. Humne jaise bataya Adarsh Pandey aur Ritik Bamba jo hamare shikshan sahayak hain, woh aapko is poore course ke dauran aapki madad karenge, aapko seekhne mein aapki help karenge. Aur humne pichhle vyakhyan mein discuss kiya tha kaise alag-alag research problem par jo ki aapke vyavaharik jeevan se juda hua hai aap us par kaise kaam kar sakte hain, kaise research problem ko aap define kar sakte hain aur kaise HCI aur Human Centered Design technology se aap uska human-centred solution nikal sakte hain. Jaise ki humne ek research problem discuss kiya tha aaj ke online education ke baare mein jahan pe ek fair examination ko conduct karna kitna mushkil hota hai aur uske baare mein humne research problem ke madhyam se dikhaya tha ki kaise aapke likhne ke tareeke se hum pata kar sakte hain kya yeh likha gaya text soch ke likha gaya hai ya kisi AI generated tool ya kisi anya madhyam se dekh ke kiya gaya hai. Humne yeh bhi discuss kiya tha ki kaise aap kisi bhi video ya audio ko ek bhaasha se doosri bhaasha mein convert kar sakte hain jisse ki jo log us bhaasha ko nahi jaante uska laabh utha saken. Humne yeh bhi discuss kiya tha ki hum saptah baar kaise alag-alag topics ko discuss karenge. Jaise ki hum design ke baare mein baat ki thi. Humne interaction ke baare mein, jo sar paraspar kriya hai, uske baare mein baat ki thi. Humne yeh bola tha ki agar aapko koi bhi solution nikalna hai to aapke user ko, jo aapka upyog karta hai, uske baare mein jaana bahut zaroori hai. Iske liye aapko yeh jaana bahut zaroori hai ki uski zarooratein kya hain, kaise aap uski zarooraton ke hisaab se apne solution ko aap bana sakte hain jisse ki jo woh karna chahe woh sahaj aur sugam tareeke se kar sake. Humne interface ke baare mein bhi baat ki thi jo ki antar falak ya sampark bindu bhi bol sakte hain. Sampark bindu ek tarah se jo aap manushya aur computer ya kisi upkaran ke beech mein jo aap paraspar kriya karna chahte hain, uska sampark bindu hota hai. Yeh sampark bindu tangible bhi ho sakta hai jisko aap bhautik roop mein touch kar sakte hain, dekh sakte hain, aur intangible bhi ho sakta hai, jaisa ki humne pichhle vyakhyan mein discuss kiya tha. Uske baad humne data requirement kisi bhi research problem ya jis problem par aap kaam kar rahe hain uske liye kis tarah ke data ki zaroorat hai, usko kaise aap ikattha kar sakte hain, kaise uska vishleshan kar sakte hain aur apne karya ko complete kar sakte hain yeh sab discuss kiya. Humne prototypes aur smart UI ke baare mein bhi quickly discuss kiya tha ki jab bhi aapko koi product ya koi service banana hota hai to

hamara hamesha pehle yeh uddeshya hota hai kya hum uska ek namuna bana sakte hain. Namuna banane ka fayda yeh hota hai ki aap dekh sakte hain yeh kaisa banega jab aap vastavikta mein isko banayenge aur woh ek tarah se aapko ek feedback bhi deta hai aapke users uske baare mein batate hain kya yeh waisa hi hai jaisa aap banana chahte hain, jaise unki zarooratein hain. Kya jo solution aap provide karna chahte hain similar hai jo unki zarooratein hain, kya woh unka kaam kar sakta hai, iski upyogita hai ya nahi yeh hum prototypes ke madhyam se discuss kar sakte hain. Humne yeh bhi discuss kiya tha aur is pe charcha ki thi ki iterative design ek bahut hi mahatvapurn ghatak hota hai kisi bhi human-centred solution ko banane ke liye. Iterative design mein hum punaravriti karte rahte hain aur har punaravriti mein jo pehle ki kamiyaan humein pata chalti hain unko hum sahi karne ki koshish karte hain aur humein pata kaise chalega ki isme koi kamiyaan hain uske liye humne charcha ki thi ki mulyankan ek bahut hi zaroori ghatak hota hai jiske madhyam se aap iska pata laga sakte hain. Alag-alag tareeke ke mulyankan hote hain jinko hum week eight mein discuss karenge. Humne yeh bhi bataya tha aaj ke jeevan mein hum charon taraf se alag-alag upkaranon se ghire hue hain jo ki Internet se jude hue hain jise hum Internet of Things bhi bolte hain uska upyog kya hai woh hum HCI ke intersection mein uski baat karenge, alag-alag uske applications aur alag-alag problems ki baat karenge jo ki aap bana sakte hain jo ki aap us par kaam kar sakte hain. Uske baad humne yeh bhi discuss kiya tha ki kaise aaj ke yug mein Artificial Intelligence, khas taur pe aaj ke samay mein Large Language Models ko use karke aap kaise ek natural sahaaj conversation bana sakte hain devices ya jo bhi aap service provide kar rahe hain human ke beech mein. Aur humne gopniyata, security ke baare mein bhi baat ki thi kaise aap koi bhi solution banate hain usmein upyogita ke liye zaroori hai ki hum usko gopniya rakhen, jo bhi aapke users ki details hain, unki information hai, uski suraksha kar saken. HCI aur AI base conversation system aur applications jismein hum khaas taur par jo conversation base systems hote hain jahan pe ek doosre se samvaad sthapit kiya jaata hai. Samvaad kai tareeke se ho sakte hain. Jaise humne discuss kiya tha, woh likh ke ho sakta hai, woh bol ke ho sakta hai, woh kisi ishara se ho sakta hai aur alag-alag tareeke se jo bhi samvaad establish hota hai jisse ki aap apna kaam kar paayein. Chahe woh kisi information ko lena ho, jaise humne discuss kiya tha, aap Alexa, Google Assistant jaise voice assistant base agents jo hote hain unse aap pooch kar koi bhi kaam apna kar sakte hain. Aur unka anuprayog kya hai? Yeh hum antim saptah mein is par charcha karenge aur hum is poore course ke dauran aapko ismein madad karenge ki aap is course ke khatam hone tak apna khud ka ek project bana paayein jo ki har saptah mein jo aapki learning rahi hai us par based ho. Humne yeh bhi bataya tha ki is poore course ke dauran hum alag-alag courses, alag-alag tools aur softwares ke baare mein jaanenge. Unka anuprayog janenge, unka vyavaharik prayog janenge. Hum alag-alag saptahon mein is par baat karenge aur in textbooks ko aap follow kar sakte hain. Humne is vishay par kaafi zor diya tha ki humein pehle yeh jaanne ki zaroorat hai ki ek accha design kya hota hai, ek bura design kya hota hai. Aapko humne yeh bhi prerith kiya tha ki aap apne vyavaharik jeevan mein aaspaas dekhein jo bhi cheezon ka aap upyog kar rahe hain. Kya woh aasani se aap use kar pa rahe hain, aasani se uska prayog kar pa rahe hain, kya wahan pe kisi bhi tareeke ki aapko dikkat ka samna karna pad raha hai. Jaisa ki humne pichhle vyakhyan mein discuss kiya tha ki

Black and Gold naamak company dwara ek tarah se aap dekh sakte hain do products ko launch kiya gaya tha jismein ek fly aur insect killer hai, doosra ek cooking oil hai, aur dono dikhne mein ek jaise dikh rahe hain. To usmein yeh kaafi hone ki sambhavana hai ki aap khana banate samay cooking oil ki jagah shayad agar insect killer daal dein, to shayad aap khana accha banana chahte hain, apne aap ko healthy banane ke liye khana chahte hain, but shayad uske baad aap hospital jana pade. Usi tareeke se alag-alag examples humne discuss kiye the. Aap purane vyakhyan ko dekh sakte hain, soch sakte hain. Aur jaisa ki maine prerith kiya tha, aap apne vyavaharik jeevan mein aaspaas dekhiye, kya aapko accha dikh raha hai, kya bura dikh raha hai design ke point of view se. Aur woh sirf non-technical cheezon ke baare mein nahi hai, woh technical cheezen bhi ho sakti hain. Non-technical cheezen bhi ho sakti hain, alag websites ho sakti hain, mobile apps ho sakte hain, aur koi bhi jo pehne wala upkaran aap use karte hain, jaise ki smart watch, aur alag-alag tareeke ke kuch bhi cheezen aap use kar rahe hain, uske baare mein aap sochiye ki uski design aapko acchi lag rahi hai ya buri lag rahi hai. Acchi hone ke alag-alag humne characteristics discuss kiye the, usmein kya hona chahiye, humne kisi bhi bad design ki characteristic discuss ki thi, woh bhi aap soch sakte hain. Yeh alag-alag examples humne good design, bad design pe alag websites ke madhyam se dekha tha aur humne aapko prerith kiya tha ki aap isko dekhein. Main aasha karta hoon ki aapne bilkul dekha hoga ki kya aapne apne vyavaharik jeevan mein koi bad design dekha hai, kis tarah ki samasyaon ka samna aapko karna pada hai, aapka anubhav kaisa raha hai. Uske baad, have you aapne kabhi socha hai ki iska uttar kya ho sakta hai, solution kya ho sakta hai, kya yeh optimal solution hai? Jo bhi aap solution ke baare mein soch rahe hain, kyunki jab tak woh optimal nahi hoga, jo aapka user hai usko sabse accha anubhav nahi mil sakta, uska kaam complete acche se nahi ho sakta. To yeh dekhna zaroori hai ki jo bhi solution, jo bhi uttar aap bana rahe hain, woh sach mein problem ko solve kar paaye, upyog ke layak ho. Aur yehi hamara uddeshya hona chahiye. Isko praapt karne ke liye, jaisa humne discuss kiya tha, aapko kai baar punaravriti karni pad sakti hai, alag-alag logon se unke mat ko jaanna pad sakta hai. Alag-alag tareeke hote hain jisko hum agle kuch saptahon mein iske baare mein aur detail mein discuss karenge. Yeh indicators jo humne discuss kiya tha ki kisi bhi bad design ke alag-alag indicators ho sakte hain. Jaisa ki aap yahan pe dekh sakte hain confusing navigation nahi hona chahiye, poor feedback nahi hona chahiye. Inconsistent design nahi hona chahiye aur atil bahut hi jatil interface nahi hona chahiye. Lack of accessibility nahi hona chahiye. Similarly humne yeh bhi discuss kiya tha ki yeh sari cheezon ka bhi aapko paalan karna padega aur dekhna padega ki yeh ek bad design hai ya good design hai. Is remote control ke madhyam se humne ek case study discuss ki thi jismein bataya tha ki kaise-kaise samay ke saath alag-alag tareeke ke remote banaye gaye hain. Unka upyogita kya hai? Kaise-kaise woh manav jeevan ke part bane hain, daily life ke part bane hain aur kaise yeh aage bhi badalta ja raha hai. Humne alag-alag case study ki thi aur jaisa maine aapse darkhwast ki thi ki aap in sabhi case studies ke baare mein in sare prashnon ko poochiye, jaaniye aur iske baare mein apne mitron se sathiyon se charcha kijiye jisse ki aap iske baare mein aur jaan paayein aur khaas taur pe jab aapko ek naya problem diya jaaye to uske baare mein aap in sare binduon ko dhyan rakhte hue achhe se us pe apna soch vichar karke ek achhe solution ki aur aage badh paayein.

Khaas taur pe usko manav kendrit karte hue, manav kendrit solution banate hue aage badh paayein. Reading book ke baare mein humne charcha ki thi. Aasha karta hoon aapne iske baare mein aur socha hoga, gym ke baare mein, booking, travel ke baare mein discuss ki thi. Uske baad humne discuss kiya tha interactive system ke baare mein jismein humne bataya tha ki yeh is tarah se pranali hoti hai jahan pe aap kaafi saahaj prakriya karte hain, saahaj kriya karte hain aur jismein aap bahut acche se samvaad kar sakte hain aur aapke samvaad ke response mein aapko turant answer mil sakta hai, response mil sakta hai ya even kuch aapse further information maangi ja sakti hai aapke prashn ke baare mein, end so on, jisse ki aapko achhe se achha uttar turant diya ja sake aur aapke kaam ko complete kiya ja sake. Iske baare mein humne alag-alag baaton ke upar charcha ki, I hope aapko woh sab cheezen yaad ho jaayengi fir se. Aur uske baad humne aapko ek kaam diya tha ki aap dekhiye ki jitne bhi digital interactive products aapke vyavaharik jeevan mein hain aaspaas, chahe woh mobile phone ho, computer ho, chahe woh voice assistant ho, Alexa ho, CV ho, chahe jitne bhi pehne योग्य उपकरण ho, kaise woh upyogi hain, kitne upyogi hain, woh kitna aasaan hai, saahaj hai usko use karna, usko aur kitna manoranjan kaarak hai use karna. Kyunki agar aap kisi bhi upkaran ko use karte samay khush nahi rahenge to aap usko aage use nahi karenge, uska upyog aage nahi karenge. So example ke taur pe humne bataya tha ki agar aapko usmein kuch aur changes karne hain, usko accha karne ke liye, to make it better usable, enjoyable, easy use and effortless, jisse ki bahut hi kam mehnat ke saath aap usko achhe se enjoy kar paayein, manoranjan kar paayein, usko uski upyogita ko use kar paayein. Aur humne bataya tha aur in sab cheezon ko karne ke liye humne bataya tha aapko simple do cheezen karni hain. Pehla ki aapko jitne bhi negative aspects hain, nakaratmak pehlu hain, unko aapko kam karna hai aur jitne uske sakaratmak pehlu hain, positive ones, you have to enhance unko aur badhana hai. To yeh sari cheezen aap dekh sakte hain aur ek cheez ka aapko aur bhi dhyan dena hai. Jaisa ki humne bataya ki jab bhi aap koi solution banate hain, usko manav kendrit banana hai kyunki woh finally kisi manav dwara use kiya jaayega. To agar aapko koi bhi solution, product kisi manav ke liye bana rahe hain, to usko aapko manav ko kendra mein rakh ke, uski zarooraton ko dhyan mein rakh ke us tareeke se banana hai. Aapko apne upyogakarta se sahanubhuti rakhni hai, kyunki har ek individual, har ek manav alag hota hai. Uski zarooratein alag hoti hain, uski taakat alag hoti hai, uski kamzori alag hoti hai. To kya hum aise logon ko dhyan mein rakhte hue, unke saath sympathize karte hue, empathize karte hue, sahanubhuti rakhte hue, kya hum unke liye ek solution aisa bana sakte hain jisse ki woh saahaj, saral tareeke se, bahut kushalta purvak apne kaam ko anjaam de saken. Aur yeh alag-alag case study ke madhyam se humne alag-alag examples discuss kiye the, charcha ki. I hope aapne uske baare mein socha hoga. Aur humne aapko darkhwast ki thi ki aap please alag-alag tareeke se alag-alag jo interactive systems aapke daily life mein use hote hain, unka use kijiye. Jaise digital map ke baare mein humne baat ki thi, digital payment ke baare mein humne baat ki thi, digital running app ke baare mein humne baat ki thi, humne project guideline ke baare mein baat ki thi jo ki Google ka hai. Aapne mujhe, aasha hai ki aapne isko dekha hoga. Iske baare mein aur jaana hoga, kyunki hamari duniya mein har tarah ke log hain, sabki apni visheshataayein hain, har kisi ki apni taakat hai, har kisi ki apni kamiyan hai. Kya hum ek aisa solution bana sakte hain jo har

kisi ko independent bana paaye, swatantra bana paaye? Kyunki agar udaharan ke taur pe agar yeh vyakti swatantra tareeke se marathon mein bhag lena chahta hai to kya woh usko poora kar sakta hai? Kya woh kisi ke upar nirbhar hue bina apne kaam ko kar sakta hai? Aur aaj ke samay mein khaas taur pe human-centered design technology is tareeke se banai ja rahi hai jo ki in kamiyon ko, jo ki uske upyogakarta ki hai, usko technology ke madhyam se complete kar sake, usko madad kar sake uske kaam ko karne mein. Humne digital travel applications ke baare mein bhi baat ki thi, jaise Bharat mein IRCTC, MakeMyTrip, Go, IBibo aur is tareeke se EasyMyTrip, end so on, dhar sare aapke paas examples hain jo bhi aap logon ne use kiya ho, uske baare mein ek baar usko kholiye, usko dekhiye, chalaiye aur uske baare mein batayiye. Kitne upyogi hai woh, kya woh apna kaam kar pa rahe hain, nahi kar pa rahe hain aur kitna aasaan hai usko use karna, kitna sahaj hai usko use karna, kitna manoranjan kaarak hai usko use karna. Kyunki jab tak yeh sari cheezen nahi hongii, aap apne upyogakarta ko retain nahi kar sakte, usko apne saath paraspar rakh nahi sakte. Adarvaiz samay ke saath woh kal ko koi aur application, koi aur solution aayega to woh uski taraf chale jaayenge. To as a company, agar aapko apni company ko aage badhana hai to aapko apne purane jitne bhi upyogakarta hain, unko kisi bhi tareeke se jaane nahi dena hai, aur woh aap tabhi kar sakte hain jab in sab cheezon ka aap dhyan rakh sakte hain apne product aur solution ke madhyam se. Aur humne credit card payment ke baare mein bhi baat ki thi ki kaafi aise log hote hain jo credit card use karte hain. Ab, kyunki jab bhi aap credit card use karte hain, jo bhi aapne kharch kiya hai, aapko ek samaybadht tareeke se, given deadline par uska payment karna hota hai. Agar aap uska payment nahi karenge to aapke upar penalty lagegi, extra paisa dena aapko padega jo ki aap nahi chahte. Har is bhagdaud ki duniya mein aisa aam taur pe hota hai ki cheezen aadmi bhool jaata hai. To kya koi tareeka hai ki hum bata paaye ki aapka credit card kab due hai, aapko kab iska bhugtan karna hai, kab tak karna hai, jisse ki aapke upar koi bhi extra penalty na lage. To is tareeke se alag-alag applications aajkal hain jo ki aapko uska reminder karte hain, uske baare mein aapko yaad dilate hain. Jaisa ki aaj ke samay pe aap keh sakte hain, jaise Paytm hai, PhonePe hai, CD hai, even dhar sare aise applications hain jahan pe ab aapko yaad dilaya jaata hai ki aapka credit card ka bhugtan itne taarikh ko kyun hai. Aap isko complete kijiye, agar aapne uska partial payment kiya hai to aapko batayega ki theek hai, aapne itna partial payment kar diya, itne rupees ka bhugtan aur karne ki zaroorat hai, itne taarikh tak. To yeh ek kisi bhi upyogakarta ke liye aasaan ho jaata hai sari cheezon ko manage karna. Khaas taur pe is bhagdaud ki duniya mein jahan par har koi alag-alag cheezon mein busy hai, alag-alag cheezon mein vyast hai, to main aasha karta hoon ki aapko ek bada accha summary mila jo ki humne pichle vyakhyaan mein charcha kiya tha. Chaliye hum agle paath ki aur aage badhte hain aur ye aap keh sakte hain rooprekha hai jo ki hum fir se karne ja rahe hain. Inmein se ye do cheezen humne kar li thi. Chaliye ab hum aage badhte hain is bache hue ghatak ki aur. To sabse pehle hum shuru karte hain digital transformation se. Jaisa ki humne pichle vyakhyaan mein aapko bataya bhi tha ki samay ke saath hum jo humare life mein physical interaction ke saath cheezen hoti thi, hum ab aaj ke samay mein technology ke madhyam se karna chahte hain. Jaisa ki humne pehle vyakhyaan mein discuss kiya tha, pehle for example humein paise kisi vyakti ke account mein daalne hote the. To yahan pe ek user hota tha jo ki

bank jaata tha aur wahan bank mein ek alag vyakti hota tha jo aapke form bhar ke dene par fir woh paise kisi aur account mein daalta tha. To aaj ke samay mein jaisa ki maine bataya ki is rozmarra ki zindagi mein kisi ke paas samay nahi hai, har kisi ko turant us kaam ko complete karna hai jisse ki woh apne samay ka behtar upyog kar sake. To kya hum bina bank jaaye, bina form bhare, bina line mein lage apne kaam ko kar sakte hain? Mazaak ke taur pe jaisa ki bola jaata hai ki agar aap government bank mein jaayein, jaise hi aapka number aane wala hota hai, to bank staff lunch ke liye chala gaya... khair, aisa to private mein bhi hota hai lekin shayad woh thoda kam hota hai. To kya hum apne samay ko aur acche se utilize kar sakte hain? Kya hum bina bank gaye, bina form bhare, bina line mein lage, bina is garmi mein, bina pollution mein jaaye apna kaam kar sakte hain? To same yahan pe aap keh sakte hain ki ab hum jo humari dependency agle bande ke upar thi, for example agar humein Saturday ya Sunday ko chhutti ke din paise transfer karne hain, to kaise hoga? Mujhe gaon pe paise bhejne bahut zaroori hai, mujhe apne dost ko paise bhejne bahut zaroori hai. Kaise hoga? To digital transformation ke madhyam se aaj ke samay par hum keh sakte hain ki hum is person ke upar jo dependency thi, is organization ke upar jo dependency thi, simple ek mobile app ke madhyam se aap ab isko chand seconds mein complete kar sakte hain. Jaisa ki aap sabhi log use karte honge. To maine isko digital money transfer ke baare mein bataya. Aap iske alag-alag applications dekh sakte hain. Chahe woh transportation ke liye ho, agar aap ja rahe hain to aap apna card jo metro ka card hai, usko recharge kar sakte hain, aap koi ticket book kar sakte hain. Ab aapko line mein counter pe lagne ki zarurat nahi hai. Similarly, khaas taur pe COVID ke time pe aapko yaad hoga pehle sari classes karne ke liye aapko class mein jaane ki zarurat thi, aapko class mein baithne ki zarurat thi. COVID ke time pe yeh sari cheezen possible nahi thi. To us samay online education ke madhyam se aap ghar baithe-baithe shiksha prapt kar pa rahe the. To yeh kya hai? Yeh kuch nahi, yeh digital transformation hi hai. Aur yeh kya kar raha hai? Yeh humare jeevan ko sagam aur aasaan bana raha hai jisse ki hum apne bahut hi bahumulya samay ko aur acche tareeke se use kar saken. Kaise use kare, woh har vyakti ke upar depend karta hai. Jaise kuch log gym jaana chahte hain to gym ja sakte hain, kuch log sports khelna chahte hain to khel sakte hain, kuch log padhai karna chahte hain, kuch log apne parivaar ke saath samay dena chahte hain, woh sari cheezen kar sakte hain. But again, aapke paas limited samay hai. Agar aapko sari cheezen karni hain to kaise karenge? Aur khaas taur pe achhe tareeke se karni hai to kaise karenge? Jaise maine pehla example diya, gym jaana hai aapko. Gym jaane ke liye kya karna padega? Aapko gym mein to jaana hi padega. Lekin agar gym mein jaana possible nahi hai to kya aap kuch cheezen ghar baithe-baithe bina trainer ke kar sakte hain? Aaj ke krtrim duniya mein, technology ki duniya mein kaafi exercise aap ghar baithe-baithe kar sakte hain, online trainer ke through kar sakte hain. Aur khaas taur pe trainer ke charges kaafi hote hain. To bahut log kya karte hain, mobile app ke madhyam se hi ek trainer ho sakta hai, virtual trainer ho sakta hai, jo ki agar hum alag-alag exercises kar rahe hain to humein bata paaye, humein apne posture ko sahi karne ki zarurat hai, humein kis cheez ko sahi karne ki zarurat hai, woh aapko bata paaye. Yeh cheezen aur achhe se ho sakti hain agar aap saath mein jo pehne yoga upkaran, jise hum wearable devices bhi bolte hain, use karein. For example aaj ke samay pe aap smart watches use kar sakte

hain, apne time pe alag-alag wrist band use kar sakte hain. Kaafi aap log cricket ke fan honge, football ke fan honge. To aapne dekha hoga Virat, Kohli ya Rohit Sharma ya jo bhi aapke favourite cricketers ho, woh alag-alag smart watch use karte hain, bade mehange smart watch pehente hain khel ke dauran jo ki unko madad karti hai unka analysis karne mein ki kaise woh ek accha game khel paaye, kya unmein kami reh gayi, kya unko aur improve karne ki zarurat hai. Kabhi-kabhi hamari body mein cheezen agar kuch kami ho rahi hai to dikhta nahi hai. Lekin agar yeh wearable upkaran hai, toh iska turant indication deta hai. For example aap bahut hi heavy exercise kar rahe hain, aapka BP bahut tezi se badh raha hai ya aapka heart rate bahut tezi se badh raha hai. To yeh cheezen shayad aap realize nahi kar paate. Jiska ek kehte hain, hamesha ek threshold hota hai, uske beyond agar jaayega to woh nuksaan kar sakta hai, heart attack ho sakta hai, aap faint hokar gir sakte hain. To kya hum aise upkaranon ke madhyam se ek accha mahaul bana sakte hain jisse ki aap surakshit rahte hue, kam samay mein, paise bachate hue, bada accha kaam kar sakte hain, apna kaam kar sakte hain. To yeh ek tareeke se alag-alag, kisi bhi apne jeevan ke pehlu ko dekh lein, wahan pe digital transformation ho raha hai. Chahe woh electricity bill ko jama karna ho, chahe woh jaise maine abhi discuss kiya, padhai ke madhyam mein ho ya alag-alag ho. To yahan par hum kuch example ke through dekhenge kaise alag-alag industry mein yeh jo digital transformation ho raha hai, humare jeevan ko prabhavit kar raha hai, achhe ki taraf prabhavit kar raha hai. Jaise hum dekh sakte hain ki digital transformation is reshaping how we live kaise hum jee rahe hain, kaise kaam kar rahe hain, kaise ek doosre se baatchet kar rahe hain. Pehle main apne professor se baat karta tha, to unke time mein agar woh PhD ke liye US jaate, to us time Google Maps nahi hota tha. Wahan pe pahunchna bada mushkil hota tha, kaise-kaise karke woh pahuchte the apne school mein admission lene ke liye. Admission lene ke baad agar mujhe apne parivaar se communicate karna hota, to aap chitthi likhte the. Aur agar woh chitthi nahi aati, to aap gaana bhi gaate the, chitti na koi sandesh aise karte the. Hum hamesha chahte the ki humein jo humare priye hain, unke baare mein pata ho, woh kaise hain, kya kar rahe hain. Aaj ke time pe technology ke madhyam se aap dekh sakte hain video calls karte hain, audio calls karte hain, messages bhejte hain. To yeh transformation ke through aap real-time mein dekh sakte hain ki aapke sange priye dost-mitr sab surakshit hain, acche se hain, aur aap unki alag tareeke se help bhi kar sakte hain. Ek aur accha example main dena chahunga. Aap logon ne shayad dekha bhi hoga kaafi aise jagah hain rural areas mein jahan pe doctors available nahi hote, khaas taur pe jo expert doctors hote hain, woh available nahi hote. For example agar aapko ek bahut hi complicated surgery karni hai aur aapke paas aise doctor nahi hain village mein, aur khaas taur pe medical ke cases mein, hum jaante hain ki kitna zaruri hai timely, samay-bandh tareeke se treatment aur surgery karna. Khaas taur pe, hum alag-alag developed countries mein dekhte hain, jahan ambulance ki suvidha utni acchi nahi hai, jahan doctors ki suvidha acchi nahi hai, jahan time pe in cheezon ko milna utna sahi nahi ho paata. To kya hum remote tareeke se, online tareeke se, kisi bhi tareeke se jo experts hain, jo humare paas physically nahi aa sakte, unki suvidha le sakte hain, unki help le sakte hain? Pichle kuch saalon mein aapne dekha hoga ki door baithe-baithe aap ek expert ko, ek surgeon ko dekh sakte hain woh bahut hi complicated surgery karta hai, hazaaron mile door baithe patient ke liye, aur woh

uska successful surgery karta hai jisse uska jeevan bach sakta hai. To yeh sari cheezen kya hai? Kuch nahi, yeh digital transformation hi to hai. So business must adopt to stay in competition in an increasing digital world. Yeh humein samay ke saath, technology ke saath aage badhna sikhatata hai, aur kisi bhi institution ya individual ke liye yeh zaruri hai ki jitna zyada ho sake, digital innovation ka benefit le. Alag-alag industries ke examples dekhein healthcare mein telemedicine ka example, AI for diagnostics. Jahan aap MRI scan ya normal scan ko computer vision ke through analyze karke AI ke madhyam se diagnose kar sakte hain, bata sakte hain kya problem hai. Digital health records ko maintain kar sakte hain. Khaas taur pe Bharat mein dekhte hain, hum ek doctor se dusre doctor ke paas jaate hain, kabhi purani bimari ka record nahi milta, kaun si dawai li, uska effect kya tha, kya dikkat thi. Agar yeh sari cheezen digitally maintain ho jaayein, to diagnosis aur treatment bahut hi simple aur effective ho sakta hai. Jab main apni PhD Singapore mein kar raha tha, wahan digital health record bade acche se maintain hote the aapki unique identity ke through, jaise NRIC ya koi aur identification number. Koi bhi doctor jab record access karta, to sari details dikhti ki ab tak kya treatment hua, kaun si bimari hui, kaun si dawai li, symptoms kya the. Bharat mein agar yeh implement ho jaaye ho sakta hai Aadhaar number ya koi aur identification number ke through to health sector ke liye bahut hi faydemand hoga. Retail sector mein digital businesses, e-commerce, supply chains, personalized services, yeh sab bhi digital transformation se kaafi beneficial ho sakte hain. Finance sector mein, jaisa ki hum jaante hain, paisa hai to aap kaafi cheezen kar sakte hain, aur kisi bhi cheez ke liye paisa chahiye. Fintech, digital payments, blockchain aur alag-alag technologies ke through hum zindagi ko aur easy aur efficient bana sakte hain. Again jaisa ki maine bataya ki hamara uddeshya yeh hai ki hum jo bhi upyog karta hai usko seedhe technology ke through uski help karein, rather den uski dependency kisi organization ya corresponding person ke upar ho. Education mein shiksha ke madhyam mein humne dekha e-learning hua, chahe digital classroom hua, virtual campus hua ya virtual classroom hua, virtual teacher hua is tarah ke madhyam se aaj ke samay pe aapne dekha hoga ki even AI base jo agent hota hai, aapko ek achhi shiksha prapt karne mein madad karta hai. Manufacturing industry bhi bahut acche tareeke se iska labh utha rahi hai. Industry 4.0, chahe woh automation ho aur chahe woh predictive maintenance ho, ki kahan pe kabhi-kabhi aapko pata hota hai ki jo alag-alag aap machines use karte hain, usmein se kuch cheezen samay ke saath kamzor hoti hain, kuch cheezen kharab hoti hain. Agar hum alag-alag information jo bhi hum ikattha kar rahe hain, chahe woh sensor information ho ya usage information ho, uske madhyam se hum pehle se bata paaye ki dekho yeh jo machine hai, iska yeh part hai, yeh ghatak hai, isko ab replace karne ki zarurat hai, isko sahi karne ki zarurat hai. Toh us madhyam se aap keh sakte hain ki aap poore system ko kharab hone se pehle, poore system ko rukne se pehle, aap sari cheezen sahi karwa sakte hain, jisse ki aapko koi pareshani ka samna na karna pade. Jaise example ke taur pe, aap dekhte honge agar aap car chala rahe hain ya car mein baithe hain, toh dekhte hain ki usmein aaj ke time pe screen par details dikhati hai ki yeh iska health status kya hai, tire ka pressure kitna hai, engine mein kitna oil hai, engine ko repair ki zarurat hai ya oil change karne ki zarurat hai. Is tarike se aap alag-alag cheezen dekh sakte hain. Abhi recently Bharat aur Pakistan ke beech mein yuddh hua, Operation Sindhur hua,

toh usmein aapne dekha tha kaise yeh jo war hui aur uske pehle jo Kargil war hui ya 1971 ki war hui, kaise alag tha. Yeh aisa yuddh tha jismein aapne dekha ki charo taraf drone ke hamle ho rahe the. Aur aaj ke time pe kewal real war nahi hoti, cyber war bhi hoti hai, surveillance ke through bhi hoti hai, alag-alag tareeke se hoti hai. Pehle hamare soldiers, jo soljers hain, zyada haath mein hote the kyunki woh directly jo bhi aapke dushman hain, unse ladaai karte the. Seedhe unko goliyon aur goli barood ka samna karna padta tha. Aaj ke time pe aap door rehkar bhi unse ladaai lad sakte hain, jisse aapke hatahat aur ghayal hone ki sambhavana kam ho jaati hai. Toh war bhi ek tarah se aap dekh sakte hain chahe woh Ukraine-Russia ka war ho, chahe Israel ya Gaza ka war ho, Hamas ka war ho aap dekh sakte hain kaise aaj ke samay mein yuddh bhi badal gaya hai technology ke digital transformation hone ke baad. Entertainment, manoranjn bhi badal raha hai. Jaise pehle aap theater mein jaate the, real cheezen dekhte the, lekin aap samay ke saath dekh sakte hain movies bhi AI generated ban rahi hain, aapke pasand-napasand ke hisaab se aapko suggestions diye jaate hain. Virtual reality ka experience diya jaata hai, interactive storytelling ka labh aapko milta hai, alag-alag tareeke se aap us duniya mein chale jaate hain. Pehle hum sunte the, bade-buude humein kahaniyan sunate the, hum sunte aur kalpana karte the ki haan aisa hoga, lekin kya hum usko experience kar paate the? Shayad utna nahi. Lekin aaj ke time pe AR, VR aur interactive storytelling ke madhyam se aap usko experience bhi kar sakte hain, uska anubhav le sakte hain aur uska zyada se zyada labh utha sakte hain. Jisse ki aapke seekhne ki prakriya acchi hogi, aapke manoranjn ki prakriya aur acchi hogi, aur aap in cheezon ka fayda utha sakte hain. Digital transformation mein aap dekh sakte hain transforming everyday life. Woh smart home se ho sakta hai. Aaj ke time pe, jaise maine bataya, chhote-chhote devices hote hain, chahe woh light ho. Jaise hamare ghar mein for example ek smart bulb hai, jo Alexa ke madhyam se juda hua hai. Main Alexa ko bolta hoon, "Alexa, turn on the light," toh woh hamare ghar ka bulb on kar deta hai. Main bolta hoon, "Alexa, bulb ka color red kar do, blue kar do, hara kar do." Toh kya hai yeh? Bahut hi romanchak hai, right? Khaas taur pe bachchon ke liye, seekhne ke liye. Woh pehle batana padta tha ki yeh kaise kaam karta hai, dialogue aisa hota hai. Aap English seekh rahe hain, aap usse dialogue kar sakte hain, alag-alag colors ke baare mein jaan sakte hain, aur usse dialogue karke dekh sakte hain directly. Similarly, kabhi-kabhi aisa hota hai ki aap apne ghar se door jaate hain kisi karya ke liye, toh kya hum IoT ke madhyam se apne ghar ke jo ped-paudhe hain, jinko samay par paani dena hai, kya hum de sakte hain? Hamare ghar mein jo lights hain, ya nal hai, ya jo bhi hai, un cheezon ko kaise manage kar sakte hain, control kar sakte hain? Woh sari cheezen aap ek tarah se dekh sakte hain, aap smart home bana sakte hain jismein sari cheezen aap better tareeke se bina aapke presence ke bhi manage kar sakte hain. Parivahan mein bhi aap dekh sakte hain, aaj ke time pe autonomous vehicles ka zor kaafi ho raha hai. Aap sabhi logon ne shayad Tesla ka naam suna hoga, jo Elon Musk ki company hai, jahan pe aap uske autonomous car dekh sakte hain ki driver ko shanti se baithna hota hai, bina steering use kiye, woh ek jagah se doosri jagah ja sakti hai. Uske andar intelligence itni hai ki usko pata hota hai ki aage koi car hai, koi aadmi hai. Abhi pichle saal main America gaya tha, Tesla car mein baitha tha. Maine dekha ki screen pe saaf-saaf dikh raha hai ki kaise aapke left mein ek cycle ja rahi hai, ek aadmi ja raha hai, ek car ja rahi hai.

Aur main toh yeh dekh ke aur bhi achambhit hua ki woh real-time mein yeh bhi dekh raha hai ki aapke samne wali traffic light lal hai, hari hai, peeli hai, aur so on. Toh us tarah se woh decision le sakta hai. Ek tarah se autonomous vehicle jo hai, woh immediate step le sakta hai, jo ki aapko dikhata hai ki car kis speed mein jaani hai, speed limit kya hai, aage koi obstruction hai ya nahi, aage koi vyakti hai ya nahi, aage koi jaanwar hai ya nahi. Jo ki kaafi kabhi-kabhi hota hai ki hum apni aankhon se nahi dekh paate bahut se reasons se, jaise aapko ho sakta hai neend aa rahi ho, ya aap apne mitra ke saath baithkar baat kar rahe ho. Achanak se koi car aa jaaye, koi vyakti aa jaaye. Khaas taur pe viksit deshon mein aapne dekha hoga ki samne gay aa gayi, bhains aa gayi, achanak se toh kya hum unko bacha sakte hain? Aawara kutto ko bacha sakte hain, kyunki unse toh un paashuon ka nuksan hoga hi, aur hume bhi accident ka samna karna pad sakta hai aur hum bhi hatprab ho sakte hain. Manoranjan ke case mein aap dekh sakte hain streaming services, virtual reality, and gaming kaafi popular ho raha hai. Communication ke case mein, jahan par samvad, aap keh sakte hain jaise humne discuss kiya, aap mein se kaafi log shayad alag-alag tareeke ke social media pe honge. Jahan par aap instant messaging karte hain, video conferencing karte hain, video meeting karte hain, audio call karte hain, group meeting karte hain, group call karte hain, aur alag-alag tareeke se content ko apne darshakon tak pahunchate hain. Woh dekh sakte hain. Challenges of... but aisa toh nahi ki aap jo bhi cheezen use kar rahe hain, uski sari achhi cheezen hi hoti hain. Jo bhi cheezen aap use karte hain, there is always some pros and there is always some cons for that. Toh kya kuch limitations ho sakti hain? Jab bhi aap koi bhi digital cheezen use karne lagte hain, toh ek tarah se aap apna digital footprint chhodte rehte hain jo ek tarah se aapke baare mein kisi ko bata sakta hai. Woh uska misuse bhi kar sakta hai. Jaise data security, data protecting personal and organizational data. Jaise aap logon ne kabhi realize kiya hoga, ki jaise aap koi phone use kar rahe hain, logon ko lagta hai ki yeh phone hamari baatein sun toh nahi raha hai. Alexa jaise ghar pe hai ya Google Assistant ghar pe, kya woh hamari baatein sun toh nahi raha hai? Sun ke kya karega woh? Sun ke woh aapko kisi bhi tareeke se keh sakta hai ki aapke jo information access hai, usko control kar sakta hai. For example, aap kisi particular ideology ko follow karte hain aur ab yeh technology ke madhyam se jo doosra banda hai, woh aapko prabhavit karna chahta hai. For example, aapko party A ko vote dene ki bajay, woh party B ko vote dene ke liye prerit karega. Aisa ho sakta hai. Kisi bhi upkaran ko, kisi bhi saman ko aap kharidna chahte hain, toh brand A ki bajay woh brand B ko zyada promote karega. Kyunki aap jaante hain ki alag-alag alag-alag jitni bhi cheezen aap use karte hain, chahe woh search ho, chahe woh e-commerce ho, bahut saari information available hoti hai. Aur jis tareeke se aap use karte hain, woh aapke baare mein aur jaanta hai aur aapko usi hisaab se recommendation deta hai un cheezon ko kharidne ke liye, un cheezon ko use karne ke liye. Mujhe nahi pata aapne kabhi is baat ka anubhav kiya hai ya nahi kiya hai. Aap prayas kariyega aur apne doston se saanjha kariyega. Aap apne phone ko bagal mein rakhiye, apne mitra ko boliye apne phone ko bagal mein rakhiye aur aise hi baat kariye: “Yaar main soch raha hoon ki ek electric bike kharidi jaaye. Suna hai woh bada achha hota hai, suna hai uska average bada achha hota hai, paisa bada sugam hai, surakshit hai.” Jo is tarah se aap kuch baatein kariye, aur fir agle ek-do din ke andar aap dekhiye ki aapke paas koi advertisement recommendation kisi bhi

product ke baare mein jo aap baat kar rahe hain, aapko kahin se aa raha hai kya? Toh maine dekha hai ki aisa kuch had tak hota hai. Again, aap apne mobile ke settings se isko off bhi kar sakte hain, but by default yeh sari cheezen on hoti hain. Toh jisse ki aapki gopniyata doosri companies ko pata chalti hai aur woh iska sahi use kar sakte hain, toh misuse bhi kar sakte hain. Digital divide ab aisa toh nahi ki har kisi ke paas in sari cheezon ka access ho. Har kisi ke paas high-end smartphone nahi hai, har kisi ke paas Alexa series nahi hai, har kisi ke paas iPhone nahi hai. Toh woh kaise un cheezon ka use karega? Toh in cheezon ka bhi hume dhyan dena padega. Khaas taur pe, hum viksit deshon mein, jahan pe hum rehte hain, jahan pe ameer log hain, bahut hi ameer log hain, gareeb log hain, middle class hain aur bahut gareeb log bhi hain. Toh kaise hum un logon ki bhi madad kar sakte hain? Un cheezon ka bhi hume dhyan dena padega. Khaas taur pe jab hum sabhi ko saath le chalne ki baat karte hain, inclusivity ki baat karte hain, accessibility ki baat karte hain, toh yeh digital divide ek bahut bada ruddha ban sakta hai. Skill gaps har kisi ka skill set alag hota hai. Hamare yahan khaas taur pe har tarah ke log hain, bahut padhe-likhe log hain aur anpadh log bhi hain. Toh usmein bahut hi antar hota hai. Toh skill gaps ki wajah se bhi aap kaise technology ke saath-saath chal sakte hain, uska labh le sakte hain. Un cheezon par bhi hume bahut zyada dhyan देने ki zarurat hai aur un cheezon ka jo gap hai, usko bridge karne ki zarurat hai. Privacy concerns jaisa ki maine bataya, kaise aap gopniyata ki ye jo pareshaniyan hain, us par dhyan de sakte hain. Addressing ethical issues related to surveillance and data connection. Udaaharan ke taur pe main aapko example dena chahta hoon. Jaise for example aapne kisi ko koi bimari hui, aapko ya kuch lakshan lage, aapne uska blood test karwaya, kuch bhi karwaya, toh ek tarah se aapka kaafi gopniya information hai. Toh jis company ke madhyam se aap yeh sari cheezen check kar rahe hain, kya hoga agar woh sari information aapke insurance company ko sell kar de? Fir kya hoga? Usse aapka nuksan hoga woh aapka premium badha sakta hai, aapko insurance देने se mana kar sakta hai. Toh ek tarah se aapka nuksan hai, yeh aapki gopniyata ka hanan hai. Yeh aapke mitron ko bata sakta hai ya dushman ko bata sakta hai jo iska misuse kar sakte hain. Toh alag-alag tareeke se aap dekh sakte hain ki gopniyata ka jo concern hai, bahut hi bada concern hai. Jab aur yeh kaafi had tak possible hota hai jab aap apne digital traces, apne digital chinho ko alag-alag platforms par alag-alag tareeke se chhodte hain. In cheezon ko handle karne ke liye hum, kyunki agle kuch saptah mein iske baare mein aur detail mein discuss karenge, toh hum bataenge ki alag-alag countries ne isko handle karne ke liye alag-alag tareeke ke nirdesh banaye hain, alag-alag guidelines banaye hain, jiska unko follow karna, paalan karna bahut hi zaruri hai. Adarvaiz unpe achhi khaasi penalty sarkar dwara lagai ja sakti hai.