

1 Human-System Lifecycle Reference Model v0i

1.1 HS.1 Life cycle involvement

1.1.1.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Life cycle involvement process* LV WR FROVLGHU WKH LQWHUHVWV DQG QHHGV RI WKH LQGLYLGXDOV DQG RU JURXS WKDW ZLOO ZRUN ZLWK WKH SURGXFW V\VWHU %HQHILW RI QIH F\FOH LQYROYHPHQW LQFOXGH WKH XVDELQW RI D SURGXFW V\VWHU LV JLYHQ VSHFLILF DWWHQWLRQ XVHU VDIWIDFWRU ZLWK DQG DFFHSWDOFH RI WKH SURGXFW V\VWHU DUH HOKDQFHG ZRUNIQJ FROGLWRQV IRU XVHUV DUH LPSURYHG VXSSRUW DQG WDJLQJ FRVWV DUH UHGXFHG XVHUV FDQ EH PDGH WR IHHO PRUH HPSRZHUHG DQG PRWLYDWHG WR QHUV WKH WKURXJK QIH FRVWV RI WKH SURGXFW V\VWHU DUH PLQLPLVHG DQG RYHUDO V\VWHU HIIHFWLYHQHV PD[LPLVHG WKH SURGXFW V\VWHU DGDSW WR FKDQJLQJ XVHU QHHGV RUJDQLVDWRU FKDQJH LQFOXGLQJ WKH UHVSROVLELQWLV RI XVHUV DQG GHYHORSHUV LV DGGUHVHG

\$V D UHVXOW RI VXFFHVVIXO LPSOHPHQDWLRQ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

SURMHFW PHHW DQG DQWLSDWH WKH LVVXH DQG ULNV DULVLQJ IURP KXPDO V\VWHU LQWHUDFWRU

WKH SURGXFW V\VWHU KDV D QIH F\FOH SKDVH SODQQLQJ DQG UHVRXUFIQJ GHVLJQHG WR FRPEDW +) ULNV LQ D FRVW HIIHFWLYH PDQQHU

WKH QHHGV RI WKH VMDNHKROGHUV LQ WKH SURGXFW V\VWHU DUH FRPPXQLFDWHG WR WKH RUJDQLVDWRU

+6 SURFHVVHV DUH DSSOLHG ZKHQ UHTXUHG LQ WKH QIH F\FOH

7KLV LV DFKLHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZLQJ VXE SURFHVVHV

1.1.2 HS.1.1 Human-system issues in conception

1.1.2.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Human issues in conception process* LV WR HVWDEOLVK D IRFXV RQ XVHU LVVXHV LQ HDFK SDUW RI WKH RUJDQLVDWRU ZKLFK GHDOV ZLWK WKH VWUDWJ\ PDUNHW RSUHQV DQG RYHUDO SODQQLQJ IRU D SURSRVHG SURGXFW V\VWHU 7KH HQHILW LQFOXGH V\VWHU ZKROH QIH FRVLQJ LQFOXGH SHUVRQHO FRVWV DQG VRIW FRVWV VXFK DV WDJLQJ DQG UHRIJDQLVDWRU WKH DVVHVVPHQW RI IXWXUH V\VWHU SHUIRUPDOFH WDNHV KXPDO DQG RUJDQLVDWRU SHUIRUPDOFH LQWR DFFRXQW V\VWHUV DUH QHV QNH\ WR HQFRXQWU SUREOHPV ZLWK RSHUDWRU DFFHSWDOFH RU ZKHQ ILHQHG WKH KXPDO DVSHFW RI V\VWHU FRVWV DQG HIIHFWLYHQHV DUH LQFOXGHG LQ WKH EXVIQHV FDUH IRU WKH SURGXFW V\VWHU

\$V D UHVXOW RI VXFFHVVIXO LPSOHPHQDWLRQ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

+6 ULNV DQG WKH LPSDFW RQ WKH VMDNHKROGHUV H[LVWLQJ V\VWHUV DQG WKH ZRUNIQJ HOYUROPHQW DUH FROVLGHUHG LQ WKH GHYHORSPHQW DQG DVVHVVPHQW RI WKH V\VWHU FROFHSW

HYROYIQJ DQG IXWXUH VMDNHKROGHU RUJDQLVDWRU VRFDO DQG QHJLVODWLYH UHTXUHPHQWV DUH GHVFULEHG LQ WKH V\VWHU VWUDWJ\

PDUNHWLQJ VWUDWJ\ WDNHV DFFRXQW RI +6 LVVXH WR GHILQH V\VWHUV ZKLFK PHHW XVHUV DQG HPSOR\HU QHHGV DQG H[SHFWDWLRQV

WKH RUJDQLVDWRU WDNHV IXWXUH DFTXLVLWRU VWUDWJ\ LQWR DFFRXQW ZKHQ GHILQIQJ RUJDQLVDWRU FKDQJH

7KIV IV DFKLIHYHG WKURXJK SHUIRUPDQFH RI WKH IROORZIQJ SUDFWLFHV

— +6 %3 ,GHQWL\ H[SHFWHG FROTH[W RI XVH RI V\VMHPV

— +6 %3 \$QD\AVH WKH SURGXFW V\VMHP FROFHSW

— +6 %3 ' HVFULEH WKH REMHFYLYHV ZKLFK WKH XVHU RU XVHU RIJDQVLDLRO ZDQW WR DFKLIHYH WKURXJK XVH RI WKH SURGXFW V\VMHP

— +6 %3 ,GHQWL\ DOG DQD\AVH WKH UROHV RI HDFK JURXS RI VMDNHKROGHUV QNH\ WR EH DIIHFWHG E\ WKH SURGXFW V\VMHP

— +6 %3 3HUIRUP UHVHDUFK LQWR UHTXLUHG SURGXFW V\VMHP XVDELOW\

— +6 %3 3UHVHOW FROTH[W DOG KXPDO UHVRXUFHV RSNLQV DOG FROVUDLOW\

— +6 %3 &ROWLEXWH WR WKH EXVLOHVV FDVH IRU WKH SURGXFW V\VMHP

1.1.3 HS.1.2 Human-system issues in development

1.1.3.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Human-system issues in development process* LV WR SUHVHQQW DOG UHSUHVHQQW WKH QHHGV RI WKH XVHU IQ WKH VSHFLILFDLRO GHVLJQ DOG YHULLFDLRO RI WKH SURGXFW V\VMHP DOG LW HOHPHQW 7KH EHQHILW LQFOXGH SRWHQWDO XVHU SUREOHPV DOG VFRSH IRU IPSURYHPHQW IQ WKH WHFKQRORJ\ VXSSRUQLQJ PDMHULO RIJDQVLDLRODO RU SK\VLFDQ HOYLUHQPHQW DUH LGHQWLILHG DOG LQFOXGHG IQ WJGH RII V\XGLHV WKH GHVLJQ RSNLQW WKDW EHVW ILW WKH IXQFLRQDO DOG XVHU DOG RIJDQVLDLRODO UHTXLUHPHQW LV HYROYHG WKH KD]DUGV WR DOG IURP XVHUV DUH LGHQWLILHG DOG PLWJDWHG

\$V D UHVXOW RI VXFFHVIXO IPSOHPHQWDLRO RI WKIV SURFHVV WKH IROORZIQJ RXWFRPHV DUH DFKLIHYHG

GHVLJQ IV EDVHG RQ WJDOV RI SURIRW\SHV E\ SRWHQWDO XVHUV

WKH SULQFISOHV RI KXPDO FHOJHG GHVLJQ DUH DSSOLHG IQ WKH GHYHORSPHQW RI WKH SURGXFW V\VMHP

+6 FRVW H J SHUVRQHO DOG WDJLQJ FRVW HIIHFYHQHV H J KXPDO SHUIRUPDQFH DOG ULNV DUH NQRZO

IHHGEDFN DOG IXUWKHU UHTXLUHPHQW IURP WKH XVHUV DUH FROHFWHG DOG XVHG

7KIV IV DFKLIHYHG WKURXJK SHUIRUPDQFH RI WKH IROORZIQJ SUDFWLFHV

— +6 %3 * HQHUDWH GHVLJQ RSNLQV IRU HDFK DVSHFV RI WKH SURGXFW V\VMHP UHODWHG WR LW XVH DOG LW HIIHFV RQ VMDNHKROGHUV

— +6 %3 3URGXFW XVHU FHOJHG VRXMLRQV IRU HDFK GHVLJQ RSNLQ

— +6 %3 ' HVLJQ IRU FXVWRPLVDLRO

— +6 %3 ' HYHORS VLPXODLRO RU WJDO IPSOHPHQWDLRO RI NH\ DVSHFV RI WKH SURGXFW V\VMHP IRU WKH SXUSRVHV RI WHVLOJ ZLWK XVHUV

— +6 %3 &ROHFW XVHU LOSXW RQ WKH XVDELOW\ RI WKH GHYHORSIQJ SURGXFW V\VMHP

— +6 %3 \$VVHVV WKH KHDONK DOG ZHO EHIQJ ULNV WR WKH XVHUV RI WKH SURGXFW V\VMHP

— +6 %3 \$VVHV WKH ULNV VR WKH FRPPXQLN DQG HOYLURQPHQW DULVLQJ IURP KXPDL HUURU IQ WKH XVH RI WKH SURGXFW V\VMHP

1.1.4 HS.1.3 Human-system issues in production and utilization

1.1.4.1 Purpose and outcomes

7KH SXUSRHV RI WKH *Human issues in production and utilization process* LV VR PDLQNDLQ FROMDFW EHWZHHQ WKH SURGXFW V\VMHP GHYHORSPHQW HQWHUSULVH XVHUV DQG WKH FOLHQW RUJDQLVDNLRO WKURXJKRXW WKH LPSOHPHQDNLRO LQWURGXFNLRO DQG YDLGDNLRO RI D SURGXFW V\VMHP 7KH EHQHILW LQFOXGH WKH ILW EHWZHHQ WKH SURGXFW V\VMHP LW RSHUDNLRODO JRDNV DQG WKH XVHU UHTXLUHPHQW LV DVVHVHGH WKH +5 LVVXH RI UH RUJDQLVDNLRO DQG WDLQLQJ DUH DQJQHG ZLWK SURGXFW V\VMHP LQWURGXFNLRO WKH SURGXFW V\VMHP LV LQFRUSRUDWHG LQWR WKH RUJDQLVDNLRO H J ZLWK WKH VDIHW\ PDQDJHPHQW V\VMHP V\VMHP VXSSRUW RUJDQLVDNLRO TXDOLW\ PDQDJHPHQW V\VMHP WDLQLQJ UHFUXLWPHQW DQG VMDII GHYHORSPHQW SURFHVVHV WKH GHQLYHUHG SURGXFW V\VMHP FROIRUPV VR LQWHUQDNLRODO QDNLRODO DQG RU VMDXWURJ\ UHTXLUHPHQW WKH FRVW WLPH VFDQHV DQG UHVRXUFHV UHTXUHG VR SXW WKH SURGXFW V\VMHP LQWR VHU\LFH DUH IXW\ XQGHUVRRG

\$V D UHVXW RI VXFFHVIXO LPSOHPHQDNLRO RI WKLV SURFHVV WKH IROORZLQJ RXWFRPHV DUH DFKLHYHG

WKH SURGXFW V\VMHP LV DGDSHG VR PHHW WKH UHTXLUHPHQW RI LQGLYLGXDO LPSOHPHQDNLROV

WUDQVNLRO LV PDGH VR QHZ GHVLJQV RI REV DQG QHZ WHDPZRUNLQJ DUUDQJHPHQW

WKH +6 LVVXH RI LQWURGXFNLRO DQG URORXW DUH DGGUHVHGH

FULWFDL +6 FULWULD DUH SDUW RI WKH DFFHSMDQFH RI WKH GHQLYHUHG SURGXFW V\VMHP

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IROORZLQJ SUDFWLFHV

— +6 %3 (YROYH RSNLROV DQG FROVWDLQW LQWR DQ LPSOHPHQDNLRO VUDDWJ\ FRYHULQJ WHFKQLFDL LQWHJUDNLRO DQG SDDQLQJ DQG PDQLQJ LVVXH

— +6 %3 ,GHQL\ VSHFL\ DQG SURGXFW WKH LQJUDVWUXFWXUH IRU WKH SURGXFW V\VMHP

— +6 %3 ODLQNDLQ FROMDFW ZLWK XVHUV DQG WKH FOLHQW RUJDQLVDNLRO WKURXJKRXW WKH GHILQNLRO GHYHORSPHQW DQG LQWURGXFNLRO RI D SURGXFW V\VMHP

— +6 %3 %XLOG UHTXUHG FRPSHWQFLHV LQWR WDLQLQJ DQG DZDUHQHV SURJUDPPHV

— +6 %3 7HVW WKDW WKH SURGXFW V\VMHP PHHW WKH UHTXLUHPHQW RI WKH XVHU WKH WDVNV DQG WKH HOYLURQPHQW DV GHILQHG IQ LW VSHFLILFDNLRO

— +6 %3 \$OD\WH IHGEDFN RO WKH SURGXFW V\VMHP GXULQJ GHQLYH\ DQG LQIRUP WKH RUJDQLVDNLRO RI HPHUJLQJ LVVXH

1.1.5 HS.1.4 Human-system issues in utilization and support

1.1.5.1 Purpose and outcomes

7KH SXUSRHV RI WKH *Human issues in utilization and support process* LV VR PROQRU DQG DGYLVH WKH XVHU RUJDQLVDNLRO RO WKH XVHU⁹ UHVSROVH VR RSHUDNLRO XVH VXSSRUW DQG PDLQHQDQFH RI WKH SURGXFW V\VMHP 7KH EHQHILW LQFOXGH SURGXFW V\VMHPV DUH PRUH UHVSROVLYH VR FKDQJHV IQ XVHU IRU H[DPSOH WKHU QHHG WDVNV FROMDFW WKH SURGXFW V\VMHP LV PRUH UHVSROVLYH VR FKDQJHV IQ LW VMDNHKROGHUV

\$V D UHVXOW RI VXFFHVVIK LPSOHPHQWDLRQ RI WKLV SURFHVV WKH IRORZLOJ RXWFRPHV DUH
DFKLHYHG

VDIH RSHUDLQRQDQ DQG KHDWK DQG VDIHW\ SURFHGXUHV DUH FRPSOLHG ZLWK

WKH ORQJ WHUP XVH RI WKH SURGXFW V\VMHP LV PROULRUHG LO UHODLQRO WR WKH GHVLJQ
LQWHQW

WKH FRPSHWHOFLHV UHTXLUHG WR XWLOVH DQG VXSSRUW WKH SURGXFW V\VMHP DUH LGHQLILHG
DQG HYROYHG RYHU WLP

XVHU DQG PDLQWLQHU UHTXLUHPHQW IRU VXSSRUW DUH PHW E\ WKH SURGXFW V\VMHP

7KLV LV

7KLV LV DFKLIHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZIQJ SUDFWLFHV

— +6 %3 &RWHFW DOG DQD\VVH IQ VHUYLFH UHSRUW WR JHQHUDWH XSGDWHV RU QHVVRQV
QHDUQW IRU WKH QH[W YHUVLRQ RI WKH SURGXFW V\VMHP

— +6 %3 ,GHQWL\ ULNVV DOG KHDWK DOG VDIHW\ LVVXH DVVRFDWHG ZLWK UHPRYDO
IURP VHUYLFH DOG GHVWUXFWLRQ RI WKH SURGXFW V\VMHP

— +6 %3 ' HILQH KRZ XVHUV ZLOO EH UH DORFDWHG GLVPLVHG WJQVHUHG WR RUKHU
GXILHV

— +6 %3 30DQ EUHDN XS RI VRFLDO VWXFWXUH

— +6 %3 ' HEULHIQJ DOG UHWURVSHFWLYH DQD\VLV IRU UHSODFPHQW V\VMHP

1.2 HS.2 Integrate human factors

1.2.1.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Integrate human factors process* LV WKH VDWLVIDFWRU\ GHSR\PHQW RI
KXPDQ V\VMHP SURFHVVHV IRU D SURGXFW V\VMHP 7KH EHQHILW IQFOXGH KXPDQ FHOXGH
GHVLJQ LV DSS\HG IQ WKH SURGXFW V\VMHP QH F\FOH WKH SURGXFW V\VMHP LV UHVSROVLYH WR WKH
JURZIQJ XOGHUVNDQGLQJ RI XVHU QHHGV +) VNLQV PHWKRGV DOG WHFKQLTXHV DUH DSS\HG WR
VXSSRUW XVHU FHOXGH GHVLJQ DOG RSHUDLRQ RI WKH SURGXFW V\VMHP

\$V D UHVXOW RI VXFFHVVIXO IPSOHPHQDWLRQ RI WKLV SURFHVV WKH IRORZIQJ RXWFRPHV DUH
DFKLIHYHG

+6 LVVXH DUH DGGUHVHG E\ WKH RIJDQLVDLRQ

+6 QH F\FOH SURFHVVHV DUH HQDFWHG

7KLV LV DFKLIHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZIQJ VXE SURFHVVHV

1.2.2 HS.2.1 Human-system issues in business strategy

1.2.2.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Human-system issues in business strategy process* LV WR WDNH DFFRXQW RI
SURGXFW V\VMHP XVDELO\W\ IQ DQ RIJDQLVDLRQV EXVLQHV VWUDWHJ\ 7KH EHQHILW IQFOXGH
VHQLRU PDQDJPHQW UHTXLUH WKDW +6 QH F\FOH SURFHVVHV KDYH D NH\ UROH IQ SURGXFW
GHYHORSPHQW SURMHFW JRDV DUH VHW DOG UHVRXUFHV DUH PDGH DYDLODEOH WR DGGUHV +6
LVVXH

\$V D UHVXOW RI VXFFHVVIXO IPSOHPHQDWLRQ RI WKLV SURFHVV WKH IRORZIQJ RXWFRPHV DUH
DFKLIHYHG

WKH XVDELO\W\ RI WKH RIJDQLVDLRQ V SURGXFW V\VMHPV IQ WKH PDUNHW ZRUN SODFH LV DW
FRPSHWULYH QHYHO

D FRUSRUDWH YLVLQ RI XVDELO\W\ DV DQ DVVHW LV HVIDEOLVKHG

WKHUH LV VHQLRU PDQDJPHQW VXSSRUW IRU WKH IPSURYPHQW RI LQJUDVWVWUXFWXUH UHODWHG
WR SURGXFW V\VMHP XVDELO\W\

7KLV LV DFKLIHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZIQJ SUDFWLFHV

— +6 %3 ' HILQH XVDELO\W\ DV D FRPSHWULYH DVVHW

— +6 %3 6HW XVDELO\W\ REMHFILYHV IRU SURGXFW V\VMHPV

- +6 %3) RORZ FRP SHWLYH VLXDLRQ IQ WKH PDUNHW SDFH
- +6 %3 ' HYHRS XVHU FHOWHG IQUDVUXFXUH
- +6 %3 ODQJHPHQW UHODWH +6 LVVXH WR EXVIQHV EHQHILW

1.2.3 HS.2.2 Human-system issues in quality management

1.2.3.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Human-system issues in quality management process* LV WR HVIDEOLVK SURPRWH DOG PDLOWDQ DO RUJDQLVDWRQDQ LQIUUVUFXFXUH DOG VMDII IRU +6 SURFHVVHV 7KH EHQHILW IQFOXGH SURMHFW VMDNHKROGHUV XQGHVMDQG WKH GHVLJQ SURMHFW DOG EXVIQHV SURFHGXUHV UHODWHG WR +6 LVVXH +6 QIH F\FOH SURFHVVHV DUH IQFRSRUDWHG IQMR H[LVLQJ TXDQV V\VMHPV SURFHGXUHV DOG VMDQGDUGV

\$V D UHVXOW RI VXFFHVIXO LPSOHPHQDWRQ RI WKLV SURFHVV WKH IRORZIQJ RXWFRPHV DUH DFKLHYHG

WKHUH LV D SRQ\F IRU +6 QIH F\FOH SURFHVVHV

VXWDEOH WRRIV DOG PHWKRGV DUH XVHG WR DGGUHV +6 LVVXH

+6 FRPSHWQFLHV DUH PDGH DYDODEOH

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZIQJ SUDFWLFHV

- +6 %3 (VIDEOLVK DOG FRPPXQLFDWH D SRQ\F IRU KXPDO FHOWHGQHV
- +6 %3 ,QFOXGH +5 DOG XVHU FHOWHG HOHPHQW IQ VXSSRUW DOG FROWRO SURFHGXUHV
- +6 %3 ' HIIQH DOG PDLOWDQ +&' DOG +5 LQIUUVUFXFXUH DOG UHVRXUFHV
- +6 %3 ,QFUHDVH DOG PDLOWDQ DZDUHQHV RI XVDEOLW
- +6 %3 ' HYHRS RU SURYLGH VMDII ZLWK VXWDEOH +6 VNLQV

1.2.4 HS.2.3 Human-system issues in authorisation and control

1.2.4.1 Purpose and outcomes

7KH SXUSRVH RI WKH *HS issues in authorisation and control process* LV WR WDNH DFFRXQW RI XVDEOLW IQ WKH DFTXLVLRQ VXSSO DOG RSHUDWRQ RI SURGXFW V\VMHPV 7KH EHQHILW IQFOXGH +6 LVVXH DUH VXSSRUWHG DOG SURPRWHG ZLWK IQ WKH YDULXV FXVWRPHU DOG VXSSQHU RUJDQLVDWRQV

\$V D UHVXOW RI VXFFHVIXO LPSOHPHQDWRQ RI WKLV SURFHVV WKH IRORZIQJ RXWFRPHV DUH DFKLHYHG

KXPDO HIIHFWLYHQHV FRVW DOG ULVN DQD\VLV UHVXOW DUH IHG IQMR WKH V\VMHP IQYHVWPHQW SURFHVV

FULWULD GHULYHG IURP +) GDWD DUH XVHG IRU DFTXLVLRQ

+6 LVVXH DUH SDUW RI RIILFDQ VLJQ RII IRU WKH SURGXFW V\VMHP DOG LW HOHPHQW

+6 SUDFWLFH DOG FDSDEOLW LV UHYLHZHG IQ RUGHU WR EXIQ RUJDQLVDWRQDQ NORZOHGJH

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZIQJ SUDFWLFHV

- +6 %3 7DNH DFFRXQW RI VMDNHKROGHU DQG XVHU LVVXHV IQ DFTXLVLWRQ DFMLYLHV
- +6 %3 7DNH DFFRXQW RI +6 LVVXHV IQ ILQDQFLDO PDQDJHPHQW
- +6 %3 \$VHVW DQG LPSURYH +6 FDSDELOLWY IQ SURFHVVHV ZKLFK DIIHFV XVDELOLWY
- +6 %3 ,QFOXGH +6 UHYLHZ DQG VLJQ RII IQ DQ UHYLHZV DQG GHFLVLRQV

1.2.5 HS.2.4 Management of human-system issues

1.2.5.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Management of HS issues process* LV IRU WKH GHSOR\HG +6 SURFHVVHV WR UHIOHFV WKH SURGXFW V\VWHV QHHGV DQG FROVWDLQW

\$V D UHVXOW RI VXFFHVVIXO LPSOLPHQMDLWRQ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

OLIH F\FOH SODQOLQJ GRFXPHQW LQFOXGH WKH ZRUN SURGXFW IURP +6 SURFHVVHV

UHVXUFXHV DQG VMDII DUH DGHTXDWH WR DGGUHVV +6 LVVXHV

WKH OLIH F\FOH SODQ DGDSW WR HPHUJLQJ +6 LVVXHV

WKHUH LV VXILFLHQW LWHUDLWRQ IQ WKH OLIH F\FOH WR DFKLHYH SURGXFW V\VWHV XVDELOLWY

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ SUDFWLFHV

- +6 %3 ' HYHORS D SODQ WR DFKLHYH DQG PDLQWLQ XVDELOLWY WKURXJKRXW OLIH
- +6 %3 ,GHQWL\ WKH VSHFLDOLWY VNLQV UHTXUHG DQG SODQ KRZ WR SURYLGH WKHP
- +6 %3 ODQDJH OLIH F\FOH SODQ WR DGGUHVV +6 LVVXHV

1.2.6 HS.2.5 HF data in trade-off and risk mitigation

1.2.6.1 Purpose and outcomes

7KH SXUSRVH RI WKH *HF data in trade-off and risk mitigation process* LV WR XVH +) GDWD IQ WJGH RII DQG ULVN PDQDJHPHQW VWXGIV IQ RUGHU WR PLUJDWH SURMHFW ULVN 7KH EHQHILW LQFOXGH SURMHFW SURFHVVHV DUH GHVLJQHG DQG PDLQWLQHG WR HQFRPSDVV +6 ULNV DQD\VVH RI KXPDO SHUIRUPDQFH FRVW DQG ULVN DUH IHG LQWR SURGXFW V\VWHV OLIH F\FOH SURFHVVHV

\$V D UHVXOW RI VXFFHVVIXO LPSOLPHQMDLWRQ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

WKH LPSDFW RI FKDQJHV IQ KXPDO SHUIRUPDQFH FRVW DQG ULVN RQ RYHUDQ SURGXFW V\VWHV FKDUDFWHULVLFV DUH LGHQWLILHG

SRWHQWDO FROQLFW EHWZHHQ +6 DQG RYKHU ULNV DQG LVVXHV DUH WJGHG RII RU RYKHUZLVH UHFRQFLOHG

SURMHFW UHVXUFXHV LV DQFRFQHG RQ WKH EDVLV RI DQ H[SOLFV DVVHVVPHQW RI WYUHDW WR SURGXFW V\VWHV XVDELOLWY

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ SUDFWLFHV

- +6 %3 3DQ DQG PDQDJH XVH RI +) GDWD WR PLUJDWH ULNV UHODWHG WR +6 LVVXHV

- +6 %3 \$VVHV WKH H[WHQW WR ZKLFK XVDELO\N FULMHULD DQG R\WKHU +6 UHTXLUHPHQW DUH QNH\N WR EH PHW E\ WKH SURSRVHG GHVLJQ
- +6 %3 (YD\XDNH WKH FXUUHQW VHYHUL\N RI HPHUJLQJ WKUHDW WR SURGXFW V\VMHP XVDELO\N DQG R\WKHU +6 ULNVV DQG WKH H\IHFWLYHQHV RI PLWJD\NLRQ PHDVXUHV
- +6 %3 7DNH H\IHFWLYH PLWJD\NLRQ WR DGGUHV ULNVV WR SURGXFW V\VMHP XVDELO\N

1.2.7 HS.2.6 User involvement

1.2.7.1 Purpose and outcomes

7KH SXUSR\N RI WKH *User involvement process* LV WR H\IHFWLYH\N LQYR\YH DQG FROVX\N XVHUV RQ HDFK VLJQLILFDQW DVSHFW RI WKH SURGXFW V\VMHP LQ RUGHU WR LPSURYH WKH XVDELO\N RI WKH SURGXFW V\VMHP RU WR HQKDQFH LWV SHUIRUPDQFH 7KH EHQHILW LQFOXGH FRPPXQLFD\NLRQ EHWZHHQ XVHUV DQG R\WKHU V\NDNHKR\GHUV LQ WKH SURGXFW V\VMHP LV H\IHFWLYH XVHUV DQG V\NDNHKR\GHUV DUH DZDUH RI WKH +6 ULNVV DQG LVVXH IRU WKH SURGXFW V\VMHP XVDELO\N DQG WKH FKDQJHV PDGH DV D UHVX\N RI WKHU LQSXW RU LQIRUPHG DV WR ZK\ FKDQJHV ZLOO QRW EH PDGH

\$V D UHVX\N RI VXFFHV\X\N LPS\OHPHQD\NLRQ RI WKLV SURFHVV WKH IR\ORZLQJ RXWFRPHV DUH DFKLHYHG

WKH QHG IRU XVHU LQYR\YHPHQW LV LGHQ\ILHG DQG DFFHSW\HG E\ WKH SURMHFW

UHSUHVH\QD\NLYH XVHUV DUH V\H\HFW\HG DQG PDGH DYDLODE\H LQ VX\ILFHQW QXPEHUV DQG LQ D \LPH\N IDVKLRQ

XVHU LQYR\YHPHQW LV ZLGHVSUHDG DQG H\IHFWLYH

WKH UHVX\NLRQ FKDQJHV WR WKH SURGXFW V\VMHP DUH UHSRUW\HG EDFN WR WKH XVHUV

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IR\ORZLQJ SUDFWLFHV

- +6 %3 \$GYRFDNH WKH XVHU SHUVSHFWLYH
- +6 %3 \$VVHV WKH ULNVV RI QRW LQYR\YLQJ HQG XVHUV LQ HDFK HYD\XDN\NLRQ
- +6 %3 ' H\ILQ D V\UDNHJ\N DQG S\DQ IRU XVHU LQYR\YHPHQW
- +6 %3 6H\HFW DQG XVH WKH PRVW H\IHFWLYH PHWKRG WR HQFLW XVHU LQSXW
- +6 %3 7DNH DFFRXQW RI XVHU LQSXW DQG LQIRUP XVHUV

1.2.8 HS.2.7 Usability engineering integration

1.2.8.1 Purpose and outcomes

7KH SXUSR\N RI WKH *usability engineering integration process* LV WKH IDFLOD\NLRQ RI LQIRUPD\NLRQ H[FKDQJH DQG FRPPXQLFD\NLRQ UHJDUGLQJ +6 LVVXH 7KH EHQHILW LQFOXGH +6 SURFHVVHV DQG WKHU SURGXFW DUH \NDNH\ DFFRXQW RI LQ WKH GHYHORSPHQW DQG RSHUD\NLRQ RI SURGXFW V\VMHPV FRPPXQLFD\NLRQ EHWZHHQ SURMHFW V\NDNHKR\GHUV UHJDUGLQJ KXPDQ LVVXH LV H\IHFWLYH +6 LVVXH DUH VXSSRUW\HG DQG SURPRW\HG ZLWK LQ WKH YDURXV FXVWRPHU DQG VXSS\HU RUJDQLVD\NLRQV HPHUJLQJ +6 LVVXH DUH LGHQ\ILHG DQG WDG RII DJDLQW R\WKHU SURGXFW V\VMHP LVVXH

\$V D UHVX\N RI VXFFHV\X\N LPS\OHPHQD\NLRQ RI WKLV SURFHVV WKH IR\ORZLQJ RXWFRPHV DUH DFKLHYHG

+) GDWD DUH SURYLGHG LQ VX\DE\H IRUPDW\N IRU XVH E\ SURMHFW V\NDNHKR\GHUV

SRWHQWDO ULNVV DULVLQJ IURP +6 LVVXHV UHODWHG WR WKH SURGXFW V\VMHP DQG LW FROWH[W DUH LGHQWLILHG

WKH PHWKRGV DQG WHFKQLTXHV XVHG IQ WKH HODFWPHQW RI +6 QIH F\FOH SURFHVVHV DUH PDMFKHG WR WKH QHHGV RI SURMHFW VMDNHKROGHUV

7KLV LV DFKLIHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ SUDFWLFHV

- +6 %3 ' HYHORS D FRPPRO WHUPLQRORJ\ IRU +6 LVVXHV ZLWK WKH RUJDQLVDLRO
- +6 %3) DFLQMDWH SHUVRQDO DQG WHFKQLFDO LQMHUFDLROV UHODWHG WR +6 LVVXHV
- +6 %3 ,GHQWL\ DQG XVH WKH PRVW VXUMDEOH GDWD IRUPDW IRU H[FKDQJLQJ +) GDWD
- +6 %3 &XVMPILVH WROV DQG PHWKRGV DV QHFHVVDU\ IRU SDULFXODU SURMHFW VMDJHV
- +6 %3 ,GHQWL\ HPHUJLQJ +6 LVVXHV

1.2.9 HS.2.8 Develop and re-use HF data

7KH SXUSR VH RI WKH *develop and re-use HF data process* LV WR GHYHORS PDLQDLO DQG SURYLGH +) GDWD DQG VMDQGDUGV WR WKH RUJDQLVDLRO 7KH EHOHILW LQFOXGH +) GDWD DUH XVHG FROVLVWHQW\

\$V D UHVXOW RI VXFFHVVI\ LPSOHPHQDWLRO RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLIHYHG

- &RUJHFW DGHTXDWH WLPD\ DQG XQPELJRXV +) GDWD DUH PDGH DYDLODEOH
- 1HZ RU UHYLVHG +) GDWD DUH SURGXFHG DV UHTXLWHG
- 9DQLGDWHG +) VMDQGDUGV DUH SURPXQJDWHG

7KLV LV DFKLIHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ SUDFWLFHV

- +6 %3 +DYH D SRQF\ IRU +) GDWD PDQDJHPHQW
- +6 %3 3SHUIRUP UHVHDUFK WR GHYHORS +) GDWD DV UHTXLWHG
- +6 %3 3SURGXFH FRKHUHQW GDWD VMDQGDUGV DQG IRUPDW
- +6 %3 ' HILQH UXOHV IRU WKH PDQDJHPHQW RI GDWD
- +6 %3 ' HYHORS DQG PDLQDLO DGHTXDWH GDWD VHDUFK PHWKRGV
- +6 %3 6HHN DQG H[SORLW H[SHUW JXLGDQFH DQG DGYLGH RQ +6 LVVXHV

1.3 HS.3 Usability engineering

1.3.1.1 Purpose and outcomes

7KH SXUSR VH RI WKH *Usability engineering process* LV WR DSS\ +6 SURFHVVHV DQG +) GDWD DV DSSURSULDWH IQ RUGHU WR HQVXUH WKH XVDELO\ RI WKH SURGXFW V\VMHP WKURXJKRXW LW QIH F\FOH 7KH EHOHILW LQFOXGH KXPDO FKDUDFWHULVLFV ZLOO EH WDNHQ LQWR DFFRXQW IQ SURGXFW V\VMHP GHILQLRO GHVLJQ GHYHORSPHQW DQG HYDIXDLRO IQ RUGHU WR RSILPILVH KXPDO PDFKLQH SHUIRUPDQFH XQGHU RSHUDLRODO FROGLROV VKRUW RU ORQJ WHUP KD]DUGV WR KHDWK DV D UHVXOW RI QRUPDO RSHUDLRO RI WKH SURGXFW V\VMHP DUH DGGUHVHG VDIHW\ ULNVV RFFXUULQJ DV D UHVXOW

RI WKH SURGXFW V\VMHP IXQFWLRQLQJ DOG EHLQJ XVHG DOG PLVXVHG IQ D UHVRQDE\ IRUHVHHDE\ PDQQHU DUH DGGUHVHG ZKHUH DSSURSULD\ VSHFLD\ QHHGV DUH H[SOLF\ FROVLGHUHG \$V D UHVX\ RI VXFFHVIX\ LPSOLPHQMD\ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

WKH SURGXFW V\VMHP PHHW XVHU QHHGV IQ LW FROWH[W RI XVH

SRVLE\H DGYHUVH HHHFW RI XVH RO KXPDO KHD\K VDIHW\ DOG SHUIRUPDQFH DUH DGGUHVHG

WKH XVHU HHHFWLYHQHV HHHFW\ DOG VDWLVIDFWLRQ ZLWK WKH SURGXFW V\VMHP DUH NQRZQ

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ VXE SURFHVVHV

1.3.2 HS.3.1 Context of use

1.3.2.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Context of use process* LV WR H\WDE\WK F\DWL\ DOG FRPPXQLFDM WKH FKDUDFWHULVLFV RI WKH XVH\ WKHLU WDVNV DOG WKH WHFKQLFD\ RUJDQLVDMRQD\ DOG WKH SK\VLFD\ HOYLWQPHQW IQ ZKLFK WKH SURGXFW V\VMHP ZL\ RSHUD\H

\$V D UHVX\ RI VXFFHVIX\ LPSOLPHQMD\ RI WKLV SURFHVV WKH IRORZLQJ RXWFRPHV DUH DFKLHYHG

WKH FKDUDFWHULVLFV RI WKH LQHQGHG XVH\ DOG WKHLU WDVNV LQFOXGLQJ XVHU LQWUDFWLRQ ZLWK RWKHU XVH\ DOG RWKHU V\VMHPV DUH GRFXPHQ\HG

WKH UHDO RSHUD\WQD\ HOYLWQPHQW RI WKH SURGXFW V\VMHP LQFOXGLQJ WKH IDFWRUV WKDW DHHFW WKH SHUIRUPDQFH RI XVH\ LV GHVFULEHG

WKH +6 LPSOLFDMRQV IRU WKH SURGXFW V\VMHP DULVLQJ IURP WKH FROWH[W RI XVH DUH LQFOXGHG IQ WKH SURGXFW V\VMHP FROVWDLQW DOG UHTXLWPHQW

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLQJ SUDFWLFHV

- +6 %3 ' HHHQ WKH VFRSH RI WKH FROWH[W RI XVH IRU WKH SURGXFW V\VMHP
- +6 %3 \$OD\VH WKH WDVNV DOG ZRUNV\VMHP
- +6 %3 ' HVFULEH WKH FKDUDFWHULVLFV RI WKH XVH\
- +6 %3 ' HVFULEH WKH FXWXUDO HOYLWQPHQW RUJDQLVDMRQD\ PDQDJHPHQW UHJLPH
- +6 %3 ' HVFULEH WKH FKDUDFWHULVLFV RI DQ\ HTXLSPHQW H[WHUQDO WR WKH SURGXFW V\VMHP DOG WKH ZRUNLQJ HOYLWQPHQW
- +6 %3 ' HVFULEH WKH QRFDMRQ ZRUNSDFH HTXLSPHQW DOG DPELHQW FROGLMRQV
- +6 %3 \$OD\VH WKH LPSOLFDMRQV RI WKH FROWH[W RI XVH
- +6 %3 3UHVVH\ WKHVH LVVXHV WR SURMFW VMDNHKROGHUV IRU XVH IQ WKH GHYHORSPHQW RU RSHUD\WLRQ RI WKH SURGXFW V\VMHP

1.3.3 HS.3.2 User requirements

1.3.3.1 Purpose and outcomes

7KH SXUSRVH RI WKH *User requirements process* LV WR HVWDEOLVK FODUL\ DQG FRPPXQLFDWH WKH UHTXLUHPHQW RI WKH XVHUV RI WKH SURGXFW V\VWHU 7KH EHQHILW LQFOXGH GHILQLWU RI WKH LVVXH FROVWDLOW DQG RSSRUXQLLHV UHODWHG WR KXPDO LQYROYHPHQW ZLWK WKH SURGXFW V\VWHU LQFOXGJ SURGXFW V\VWHU SHUIRUPDQFH DQG XVDELOLWY FULWULD FRPIRUW VDIHW\ KHDWK DQG PRWLYDWRU ZRUNV\VWHU DQG GHJLVODWLYH LVVXH PDLQWHDQFH DQG VXSSRUW UHTXLUHPHQW SURGXFWU RI DQ HVWLPDWH RI ZKDW KDV QRW EHHQ VSHFLHG FODULFDWRU RI WKH FROVWDLOW RSSRUXQLLHV DQG GHJUHH RI IHH[LLELOLWY UHTXUHG RI WKH SURGXFW V\VWHU VHWUHQ RI SULRUWLHV IRU WKH UHTXLUHPHQW

\$V D UHVXOW RI VXFFHVIXO LPSOHPHQDWLRQ RI WKH SURFHVV WKH IRORZLOJ RXWFRPHV DUH DFKLHYHG

UHQHYDQW JURXS RI XVHUV ZLWKLO WKH VWDNHKROGHUV DQG WKHU WDVN QHHGV DUH LGHQWLHG DQG DQD\VHG

WKH UHTXLUHPHQW RI WKH XVHUV RI WKH SURGXFW V\VWHU DUH GHILQH

XVHU FULWULD IRU WKH SHUIRUPDQFH RI WKH ZRUNV\VWHU DJDLQW RSHUDWRU DQG IXQFWLRQDO REMHFWLYHV DUH VWDWHG

XVHU UHTXLUHPHQW DUH DGGUHVVHG LQ WKH SURGXFW V\VWHU GHVLJQ

7KLV LV DFKLHYHG WKURXJK SHUIRUPDQFH RI WKH IRORZLOJ SUDFWLFHV

— +6 %3 6HW DQG DJUHH WKH H[SHFWHG EHKDYIRXU DQG SHUIRUPDQFH RI WKH SURGXFW V\VWHU ZLWK UHVSHFW WR WKH XVHU

— +6 %3 'HYHORS DQ H[SOLFWR VWDWHPHQW RI WKH XVHU UHTXLUHPHQW IRU WKH SURGXFW V\VWHU

— +6 %3 \$QD\VH WKH XVHU UHTXLUHPHQW

— +6 %3 *HQUHW DQG DJUHH RQ PHDVXUDEOH FULWULD IRU WKH SURGXFW V\VWHU LQ LW LQWHOGHG FROVWU RI XVH

— +6 %3 3UHVHQW WKHVH UHTXLUHPHQW WR SURMHFW VWDNHKROGHUV IRU XVH LQ WKH GHYHORSPHQW DQG RSHUDWRU RI WKH SURGXFW V\VWHU

1.3.4 HS.3.3 Produce design solutions

1.3.4.1 Purpose and outcomes

7KH SXUSRVH RI WKH *Produce design solutions process* LV IRU WKH GHVLJQ RSWLRQV IRU WKH SURGXFW ZRUNV\VWHU WR WDNH DFFRXQW RI +) GDWD

\$V D UHVXOW RI VXFFHVIXO LPSOHPHQDWLRQ RI WKH SURFHVV WKH IRORZLOJ RXWFRPHV DUH DFKLHYHG

+6 LVVXH DUH FROVLGHUHG LQ WKH WJGH RII EHWZHHQ GHVLJQ RSWLRQV

XVDELOLWY LV WJGHG RII DJDLQW RUKHU GHVLJQ FULWULD

DQ XVHU DVSHFW RI WKH SURGXFW V\VWHU IRU H[DPSOH REV UROHV GRFXPHQDWLRQ VWDIIHQ DUH GHVLJQH

8VHU LQSXW GUHFW DQG RU DV IHHGEDFN IURP HYDQDWRUQV LV LQFRUSRUDWHG LQ WKH GHVLJQ

7KLV LV DFKLHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZIQJ SUDFWLFHV

- +6 %3 ' LVWLEXWH IXQFWLRQV EHWZHHQ WKH KXPDO PDFKLOH DOG RIJDQLVNLRODO HOHPHQW RI WKH SURGXFW V\VMHP EHVW DEOH WR IXOHO HDFK IXQFWLRQ
- +6 %3 ' HYHORS D SUDFWLFDQ PRGH RI WKH XVHU ZRUN IURP WKH UHTXLUHPHQW FROMH[W RI XVH DOORFDNLRO RI IXQFWLRQ DOG GHVLJQ FROVWUDLQW IRU WKH SURGXFW V\VMHP
- +6 %3 SURGXFH GHVLJQV IRU WKH XVHU UHODWHG HOHPHQW RI WKH SURGXFW V\VMHP WKDW WDNH DFFRXQW RI WKH XVHU UHTXLUHPHQW FROMH[W RI XVH DOG +) GDWD
- +6 %3 SURGXFH D GHVFULNLRO RI KRZ WKH SURGXFW V\VMHP ZLOO EH XVHG
- +6 %3 5HYLVH GHVLJQ DOG VDIHW\ IHDWXUHV XVIQJ IHHGEDFN IURP HYDOXDNLROV

1.3.5 HS.3.4 Human Factors evaluation

1.3.5.1 Purpose and outcomes

7KH SXUSR VH RI WKH *Human Factors evaluation process* LV WR FROHFW DOG UHSRUW IHHGEDFN RQ WKH HYDOXDNLRO RI WKH DVSHFW RI WKH SURGXFW V\VMHP UHODWHG WR LWV XVH RU XVHUV

\$V D UHVXQW RI VXFHVVIHO LPSOHPHQDNLRO RI WKLV SURFHVW WKH IRORZIQJ RXWFRPHV DUH DFKLHYHG

IRUPDWLYH HYDOXDNLRO SURYLGHV GHVLJQ LOIRUPDWLRO QHZ ULNVV DOG LVVXHV

VXPPDWLYH HYDOXDNLRO GHFROVWUDLQW WKH IXOLOPHQW RI XVHU UHTXLUHPHQW

WKH RIJDQLVNLRO KDV LOIRUPDWLRO RQ ZKLFK WR EDVH D GHFVLRO UHJDUGLQJ RQH RU PRUH +6 LVVXHV

7KLV LV DFKLHYHG WKURXJK SHUIRUPDOFH RI WKH IRORZIQJ SUDFWLFHV

- +6 %3 30DQ WKH HYDOXDNLRO
- +6 %3 ,GHQWL\ DOG DQD\NH WKH FROGLNLROV XQGHU ZKLFK D SURGXFW V\VMHP LV WR EH WHVWHG RU RYKHUZHVV HYDOXDWHG
- +6 %3 &KHFN WKDW WKH SURGXFW V\VMHP LV ILW IRU HYDOXDNLRO
- +6 %3 &DUJ\ RXW DOG DQD\NH WKH HYDOXDNLRO DFFRUGLQJ WR WKH HYDOXDNLRO SUDO
- +6 %3 8QGHUVNDQG DOG DFW RQ WKH UHVXQW RI WKH HYDOXDNLRO