$FFHVVLELOLW\ &RQVXOWLQJ -HQNLQV
$FFHVVLELOLW\ 5HVHDUFK 5HVXOWV

7H0HFR P ,7

YHUVLRQ

ZDV VWDQGLQJ

VWDWXV)LQD0

DXWKRU &RUGX0D 80EULFKW

3URWHFWLRQ F0DVV ,QWHUQD0

HGLWRU

8VDEL0LW\ $FFHVVLEL0LW\ 7HDP

'HXWVFKH 7H0HNRP ,7 *PE+
'LJLWD0 7UDQVIRUPDWLRQ DQG 2SHUDWLRQV ('7237
+R0]KDXVHU 6WU   %HU0LQ

IL0HQDPH	GRFXPHQW QXPEHU	GRFXPHQW 0DEH0
	%)B-HQNLQVB	UHSRUW
-HQNLQVB$FFHVVLEL0LW\([DPLQDWLRQB5HSRUW GRF P		

YHUVLRQ	ZDV VWDQGLQJ	VWDWXV
		)LQD0

DXWKRU	TXD0LW\ DVVXUDQFH	5H0HDVHG E\
&RUGX0D 80EULFKW	)UDQN %UHLGHQVWHLQ	)UDQN %UHLGHQVWHLQ
&RUGX0D 80EULFKW#W V\VWHPV FRP	)UDQN %UHLGHQVWHLQ #WH0HNRP GH	)UDQN %UHLGHQVWHLQ #WH0HNRP GH
%HU0LQ)HEUXDU\	'RUWPXQG)HEUXDU\	'RUWPXQG)HEUXDU\

FRQWDFW SHUVRQ	SKRQH	HPDL0
6XVDQQH :DVVHUURWK		VXVDQQH ZDVVHUURWK#W V\VWHPV FRP

TXLFN LQIR

7KLV WHVW UHSRUW FRQWDLQV WKH UHVX0WV RI WKH -HQNLQV   DFFHVVLEL0LW\ VWXG\

7DE0H RI FRQWHQWV

0DQDJHPHQW VXPPDU\

)URP   WR   WKH DSSOLFDWLRQ -HQNLQV YHUVLRQ   ZDV VXEMHFWHG WR
DQ DFFHVVLELOLW\ WHVW 7KH DFFHVVLELOLW\ VWXG\ ZDV FDUULHG RXW LQ WKH IRUP RI D FKHFNOLVW
EDVHG WRRO VXSSRUWHG H[SHUW HYDOXDWLRQ 7KLV UHSRUW FRQWDLQV WKH GRFXPHQWDWLRQ DQG WKH
UHVXOWV RI WKLV H[SHUW HYDOXDWLRQ

6XPPDU\ DQG RYHUDOO WHVW UHVXOW

2YHUDOO WKH QXPEHU DQG VHYHULW\ RI WKH LGHQWLILHG DFFHVVLELOLW\ LVVXHV UHVXOW LQ WKH
IROORZLQJ RYHUDOO UHVXOW

-HQNLQV DFFHVVLELOLW\ LV KLJKO\
OLPLWHG

,Q WKH DFFHVVLELOLW\ VWXG\   WHVW FULWHULD ZHUH XVHG ZKLFK DUH EDVHG RQ WKH XQGHUO\LQJ
UHTXLUHPHQWV RI %,79   RU :&$*   DQG :&$*   VHH 6HFWLRQ $

%DVHG RQ WKHVH DVVHVVPHQW FULWHULD   -HQNLQV DFFHVVLELOLW\ LVVXHV ZHUH LGHQWLILHG YDU\LQJ
LQ VHYHULW\ 7KH\ SUHVHQW WKHPVH0YHV WR WKH DIIHFWHG XVHUV DV HLWKHU D VHULRXV E0RFNDJH D
PDMRU KXUG0H RU PLQRU LPSDLUPHQWV 0RUH LQIRUPDWLRQ RQ WKLV FDWHJRUL]DWLRQ FDQ EH
IRXQG LQ 6HFWLRQ $

)RU DQ RYHUYLHZ RI KRZ PDQ\ LVVXHV ZHUH LGHQWLILHG LQ HDFK FDWHJRU\ VHH WKH WDEOH
EH0RZ

FDWHJRU\	1XPEHU
E0RFNDGH	
KXUG0H	
LPSDLUPHQWV	
WRWD0	

7DE0H   2YHUYLHZ RI WKH WRWD0 QXPEHU RI LGHQWLILHG SUREOHPV SHU FDWHJRU\

'HWDL0HG LQIRUPDWLRQ RQ WKH FD0FX0DWLRQ RI WKH WHVW UHVX0W FDQ EH IRXQG LQ $QQH[$

'LIIHUHQWLDWLRQ RI WKH WHVW UHVX0W DFFRUGLQJ WR XVHU JURXSV

$ PRUH GLIIHUHQWLDWHG SLFWXUH PD\ HPHUJH IRU WKH LQGLYLGXD0 XVHU JURXSV DIIHFWHG FI
$SSHQGL['   GHSHQGLQJ RQ ZKHWKHU WKH LGHQWLILHG SUREOHPV DUH UH0HYDQW IRU WKH UHVSHFWLYH
XVHU JURXS 7KHUHIRUH LQ WKH IR00RZLQJ WKH LQGLYLGXD0 XVHU JURXSV DUH FRQVLGHUHG DFFRUGLQJ
WR WKHLU 0LPLWDWLRQV

Motorized Users

Jenkins is for users with motor disabilities restricted access

Visually Impaired Users

Jenkins is for visually impaired users easily accessible

Blind Users

Jenkins is for blind users severely restricted access

Hearing Impaired Users

Jenkins is for the hearing impaired very accessible

Overview of the type and number of identified problems by user group

category	visually impaired designated users	blind people user	motoric in restricted user	hearing impaired said users
blockade				
hurdle				
impairments				
total				

Table   Overview of the type and number of identified problems by user group

Content summary

An overview of the identified problems and the respective category as well as the affected user groups can be found in the following table

File name Jenkins_AccessibilityInvestigation_Report.docm

Version

W ständig

Status Final

Protection class

Internal

SURE0HP	FDWHJRU\	$IIHFWHG XVHU JURXSV
7KH VNLS 0LQN WR WKH PDLQ FRQWHQW LV QRW GLVS0D\HG	LPSDLUPHQW	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV
3DJH VHFWLRQV DUH QRW HIILFLHQW0\ VNLSSDE0H	LPSDLUPHQW	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
7KHUH LV D 0RVV RI IRFXV LQ LPSRUWDQW S0DFHV	LPSDLUPHQW	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
,PSRUWDQW FRQWHQW FDQQRW EH DFFHVVHG DQG RSHUDWHG XVLQJ WKH NH\ERDUG	KXUG0H	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
6RPH FRQWHQW LV XQXVXD0 IRU NH\ERDUG XVHUV WR RSHUDWH	LPSDLUPHQW	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
2ULHQWDWLRQ DQG QDYLJDWLRQ LQ WKH DSS0LFDWLRQ DUH GLIIFX0W	KXUG0H	E0LQG XVHUV
7KH IRFXV RUGHU LV QRW 0RJLFD0 LQ VRPH S0DFHV	KXUG0H	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
,QGLYLGXD0 YLVXD0 KHDGLQJV DUH QRW VWUXFWXUHG VHPDQWLFD00\	LPSDLUPHQW	E0LQG XVHUV
7DEV FDQQRW EH SHUFHLYHG DV VXFK E\ WKH E0LQG	LPSDLUPHQW	E0LQG XVHUV
7DE0H FRQWHQWV FDQ WZ DUH QRW FRUUHFW0\ SHUFHLYHG	KXUG0H	E0LQG XVHUV
0DQ\ 0LQNHG 8,0HHPHQWV DUH QRW F0HDU0\ 0DEH0HG	KXUG0H	E0LQG XVHUV
)RUP 0DEH0V DUH H J 7 QRW SURJUDP PDWLFD00\ GHWHU PLQHG	KXUG0H	PRWRULFD00\ DIIHFWHG SUHJQDQW XVHUV E0LQG XVHUV
,QSXW ILH0GV IRU XVHU GDWD GR QRW FRQYH\ WKH SXUSRVH	LPSDLUPHQW	E0LQG XVHUV
*UDSKLF HYD0XDWLRQV DUH QRW DFFHVVLE0H	EHVW SUDFWLFHV	E0LQG XVHUV
'HFRUDWLYH JUDSKLFV DUH QRW KLGGHQ IRU E0LQG XVHUV	LPSDLUPHQW	E0LQG XVHUV
&RQWHQW GRHV QRW ZUDS SURSHU0\ DW	LPSDLUPHQW	YLVXD00\ LPSDLUHG XVHU

)L0H QDPH -HQNLQVYB$FFHVVLEL0LW\,QYHVWLJDWLRQB5HSRUW GRFP

9HUVLRQ
6WDWXV)LQD0

:DVIDQGLQJ
3URWHFWLRQ F0DVV

,QWHUQD0

SUREOHP	FDWHJRUB	$IIHFWHG XVHU JURXSV
6RPH FRQWHQW LV QRW HDVL0\ UHFRJQL]DEOH GXH WR SRRU FRQWUDVW	KXUG0H	YLVXD00\ LPSDLUHG XVHU
*UDSKLF LQIRUPDWLRQ LV FRQYH\HG RQ0\ E\ FRORU	EHVW SUDFWLFHV	YLVXD00\ LPSDLUHG XVHU
7KH PDLQ 0DQJXDJH RI WKH DSS0LFDWLRQ LV QRW VSHFLILHG FRUUHFW0\	LPSDLUPHQW	E0LQG XVHUV
0DQ\ (QJ0LVK WHUPV DUH XVHG LQ WKH *HUPDQ LQWHUIDFH	LPSDLUPHQW	E0LQG XVHUV

7DE0H   &RQWHQW RYHUYLHZ RI WKH LGHQWLILHG SUREOHPV

6HH 6HFWLRQ   IRU GHWDL0V RQ WKH LVVXHV

6WUXFWXUH RI WKH GRFXPHQW

7KH GRFXPHQW LV VWUXFWXUHG DV IR00RZV

- á 6HFWLRQ   FRQWDLQV WKH GHWDL0HG UHVX0WV VHFWLRQ LQ ZKLFK QHJDWLYH ILQGLQJV RU LGHQWLILHG SUREOHPV ZLWK UHJDUG WR DFFHVVLEL0LW\ DV ZH00 DV WKH GHULYHG UHTXLUHPHQWV DQG UHFRPPHQGDWLRQV DUH GHVFULEHG ,Q DGGLWLRQ UHVX0WV PD\ EH LQF0XGHG WKDW JLYH UHFRPPHQGDWLRQV IRU RSWLPL]DWLRQ ZLWKRXW WKH XQGHU0\LQJ ILQGLQJ UHSUHVHQWLQJ D UH0HYDQW LPSDLUPHQW %HVW 3UDFWLFH FDWHJRU\ 7KH UHPDLQLQJ ILQGLQJV LH PHW DQG QRQ DSS0LFDEOH DFFHVVLEL0LW\ FULWHULD DUH QRW0LVWHG VHSDUDWH0\ KHUH IRU UHDVRQV RI F0DULW\

- á $ F0HDU 0LVW RI D00 UHVX0WV FDQ EH IRXQG LQ WKH 0LVW RI UHVX0WV RQ SDJH

- á $ 0LVW RI D00 LVVXHV DQG UHFRPPHQGDWLRQV LV D0VR SURYLGHG LQ D VHSDUDWH ([FH0 IL0H ZLWK WKH UHSRUW ,W FDQ EH XVHG IXUWKHU DV D 0LVW RI PHDVXUHV WR UHFWLI\ WKH LGHQWLILHG SUREOHPV

- á 7KH DSSHQGLFHV FRQWDLQ IXUWKHU GHWDL0V RQ WKH SURFHGXUH ERXQGDU\ FRQGLWLRQV SULQFLS0HV DQG PHWKRGR0RJ\ RI WKH LQYHVWLJDWLRQ DV ZH00 DV RXU GHF0DUDWLRQ RI LQGHSHQGHQFH

0LVW RI UHVX0WV

UHVX0W	7KH VNLS 0LQN WR WKH PDLQ FRQWHQW LV QRW GLVS0D\HG
UHVX0W	3DJH VHFWLRQV DUH QRW HIILFLHQW0\ VNLSSDE0H
UHVX0W	7KHUH LV D 0RVV RI IRFXV LQ LPSRUWDQW S0DFHV
UHVX0W	,PSRUWDQW FRQWHQW FDQQRW EH DFFHVVHG DQG RSHUDWHG XVLQJ WKH NH\ERDUG
UHVX0W	6RPH FRQWHQW LV XQXVXD0 IRU NH\ERDUG XVHUV WR RSHUDWH
5HVX0W	2ULHQWDWLRQ DQG QDYLJDWLRQ LQ WKH DSS0LFDWLRQ DUH GLIIFX0W
5HVX0W	7KH RUGHU RI WKH IRFXV LV QRW 0RJLFD0 LQ VRPH S0DFHV
UHVX0W	,QGLYLGXD0 YLVXD0 KHDGLQJV DUH QRW VWUXFWXUHG VHPDQWLFD00\
UHVX0W	7DEV FDQQRW EH SHUFHLYHG DV VXFK E\ WKH E0LQG
UHVX0W	7DE0H FRQWHQWV FDQ WZ DUH QRW SHUFHLYHG FRUUHFW0\
UHVX0W	0DQ\ 0LQNHG 8, H0HPHQWV DUH QRW F0HDU0\ 0DEH0HG
UHVX0W	)RUP 0DEH0V DUH H J 7 FDQQRW EH GHWHUPLQHG SURJUDPPDWLFD00\
UHVX0W	,QSXW ILH0GV IRU XVHU GDWD GR QRW FRQYH\ WKH SXUSRVH
UHVX0W	*UDSKLF HYD0XDWLRQV DUH QRW DFFHVVLE0H
UHVX0W	'HFRUDWLYH JUDSKLFV DUH QRW KLGGHQ IRU E0LQG XVHUV
UHVX0W	&RQWHQW GRHV QRW ZUDS SURSHU0\ DW
UHVX0W	6RPH FRQWHQW LV QRW HDVL0\ UHFRJQL]DE0H GXH WR SRRU FRQWUDVW
UHVX0W	*UDSKLFD0 LQIRUPDWLRQ LV FRQYH\HG RQ0\ E\ FR0RU
UHVX0W	7KH PDLQ 0DQJXDJH RI WKH DSS0LFDWLRQ LV QRW VSHFLILHG FRUUHFW0\
UHVX0W	0DQ\ (QJ0LVK WHUPV DUH XVHG LQ WKH *HUPDQ LQWHUIDFH

UHVX0WV

7KLV VHFWLRQ SUHVHQWV WKH UHVX0WV RI WKH LQYHVWLJDWLRQ LQ WKH IR00RZLQJ IRUPDW

5HVX0W   6KRUW FRUH VWDWHPHQW

3RVVLE0\ SRVLWLYH DVSHFWV

'HGLFDWHG GHVFULSWLRQ RI WKH IDFWV RU WKH SURE0HP SRVVLE0\ VXSS0HPHQWHG ZLWK VFUHHQVKRWV

)LJXUH   ([DPS0H VFUHHQVKRW RI WKH DSS0LFDWLRQ

([S0DQDWLRQ RI FRQQHFWLRQV LQWHUSUHWDWLRQ RU HYD0XDWLRQ

UHFRP PHQGDWLRQV

FRQWH[W	QDYLJDWLRQ DUHD VLGH DUHD ILH0G IXQFWLRQ EXWWRQ
FULWHULD	,QGLFDWLRQ RI WKH DIIHFWHG DFFHVVLEL0LW\ FULWHULD
XVHU JURXSV	E0LQG _ 9LVXD00\ LPSDLUHG _ 0RWRULFD00\ LPSDLUHG SHRS0H _ KHDULQJ LPSDLUHG
FDWHJRU\	LPSDLUPHQW _ KXUG0H _ E0RFNDGH _ EHVW SUDFWLFHV

7KH GHVFULSWLRQ FRQWDLQV WKH IR00RZLQJ FRPSRQHQWV

- á   7KH ILUVW 0LQH FRQWDLQV D FRQFLVH GHVLJQDWLRQ RI WKH UHVX0W

- á $ GHWDL0HG GHVFULSWLRQ RI WKH ILQGLQJ IR00RZV EH0RZ WKLV 0LQH :LWKLQ WKLV GHVFULSWLRQ VFUHHQVKRWV SRVLWLYH DVSHFWV LGHQWLILFDWLRQ   DV ZH00 DV DGGLWLRQD0 H[S0DQDWLRQV RU LQWHUSUHWDWLRQ RI WKH REVHUYDWLRQV LGHQWLILFDWLRQ   DQG UHFRP PHQGDWLRQV IRU DFWLRQ PDUNLQJ   0LVWHG

- á   7KH FRQWH[W LV WKHQ UHSURGXFHG IRU WKH SXUSRVH RI EHWWHU DVVLJQPHQW RI WKH GHVFULEHG UHVX0W +HUH VXSHURUGLQDWH DQG VXERUGLQDWH DUHDV RU

CONSECUTIVE ACTIONS SEPARATED BY ! * General is indicated for general problems that occur again and again

- The accessibility criteria that are affected by the problem described are then specified

- Then the user groups affected by the problem are specified

- Finally, under Category the classification is made with regard to the degree of severity (impairment, hurdle or blockage). In addition, a fouth category Best Practice indicates a result that does not have a negative impact on the overall result but indicates important potential for improvement

Annotation

As a rule, only problematic or best practice findings are explained in the results section. Fulfilled or non applicable criteria can be found in the attached Excel list Checklist sheet. Only in exceptional cases are fulfilled or non applicable test criteria listed in this section, e g B if a particularly good implementation of individual accessibility requirements has been determined

Keyboard operation and navigation

Result: The skip link to the main content is not displayed

There is a skip link to the main content

However, the skip link is not visible when focus is maintained, so keyboard users cannot see and use the link

Figure: Skip link not visible when maintaining focus

In addition, the existing skip link has no discernible function. The jump target skip content is defined with name instead of id (name is not a valid attribute for the a element)

6NLS 0LQNV DUH XVHG E\ PRWRU LPSDLUHG DQG E0LQG XVHUV WR VNLS UHFXUULQJ DUHDV VXFK DV H J % WKH QDYLJDWLRQ GLUHFW0\ WR WKH PDLQ FRQWHQW DUHD DQG WKXV VXSSRUW HIILFLHQW QDYLJDWLRQ

7KH VNLS 0LQN VKRX0G EHFRPH YLVXD00\ YLVLE0H ZKHQ IRFXV LV REWDLQHG 7R GR WKLV WKH SRVLWLRQ RI WKH VNLS 0LQN PXVW EH PRYHG WR WKH YLVLE0H DUHD XVLQJ &66

8VH LG   VNLS FRQWHQW IRU WKH MXPS WDUJHW

FRQWH[W	6NLS 0LQN DW WRS RI SDJH
FULWHULD	%\SDVVLQJ (0HPHQW *URXSV
XVHU JURXSV	PRWRU LPSDLUHG
FDWHJRU\	LPSDLUPHQW

5HVX0W   3DJH DUHDV DUH QRW HIILFLHQW0\ VNLSSDE0H

7KHUH DUH WKUHH SDJH DUHDV PDUNHG DV UHJLRQV ZLWK WKH FRUUHVSRQGLQJ +70/ H0HPHQWV KHDGHU! DQG IRRWHU! DQG UR0H VHDUFK

+RZHYHU LPSRUWDQW DUHDV RI WKH SDJH FDQQRW EH VHW DV D UHJLRQ DUH SHUFHLYHG DQG D0VR QRW GLUHFW0\ MXPSHG WR RU VNLSSHG ,WV PLVVLQJ

' HWDL0HG UHFRPPHQGDWLRQV IRU WKH LPS0HPHQWDWLRQ RI VNLS 0LQNV DUH SURYLGHG H J % KWWSV ZHEDLP RUJ WHFKQLTXHV VNLSQDY DQG KWWSV GHY WR]LL]LXP KRZ WR LPS0HPHQW DFFHVVLELOLW\ VNLS WR FRQWHQW G P

' HWDL0HG UHFRPPHQGDWLRQV IRU XVLQJ WKH UHJLRQV DUH SURYLGHG H J % KWWSV ZZZ Z RUJ :$, WXWRULD0V SDJH VWUXFWXUH UHJLRQV

,GHQWLILFDWLRQ RI WKH EUHDGFUXPE DQG VLGHEDU QDYLJDWLRQ DUHDV WKH DUHD ZLWK DGGLWLRQD0
LQIRUP DWLRQ DERXW WKH EXL0GV LQ WKH 0RZHU VLGHEDU DQG WKH PDLQ FRQWHQW DUHD

,Q DGGLWLRQ WR KHDGLQJV VLGH DUHDV RIIHU D SRVVLELOLW\ IRU VWUXFWXUD0 QDYLJDWLRQ
+RZHYHU LI QRW D00 DUHDV RI WKH DSS0LFDWLRQ DUH VHPDQWLFD00\ PDUNHG DV VXFK WKH\
FDQQRW EH DFFHVVHG GLUHFW0\ E\ VFUHHQ UHDGHU RU NH\ERDUG XVHUV YLD EURZVHU DGG RQ

7KH EUHDGFUXPE DQG WKH VLGHEDU DUH WR EH PDUNHG DV QDYLJDWLRQ DUHDV ZLWK WKH
QDY! H0HPHQW 7R GLVWLQJXLVK EHWZHHQ WKH WZR QDYLJDWLRQ DUHDV D PHDQLQJIX0 DULD
0DEH0 PXVW EH DVVLJQHG ZKLFK PDNHV LW F0HDU ZKLFK QDYLJDWLRQ DUHD LV LQYR0YHG 7KH
PDLQ FRQWHQW DUHD LV WR EH PDUNHG ZLWK WKH PDLQ! H0HPHQW

FRQWH[W	*HQHUD00\ HQWLUH DSS0LFDWLRQ
FULWHULD	%\SDVVLQJ (0HPHQW *URXSV
XVHU JURXSV	E0LQG _ PRWRU LPSDLUHG
FDWHJRU\	LPSDLUPHQW

5HVX0W   7KHUH LV D 0RVV RI IRFXV LQ LPSRUWDQW S0DFHV

$IWHU VH0HFWLQJ LQGLYLGXD0 LQWHUDFWLYH H0HPHQWV WKH IRFXV LV 0RVV DQG WKH IRFXV LV VHW WR WKH
WRS RI WKH SDJH 7KLV 0HDGV WR FRQVLGHUDE0H HIIRUW IRU XVHUV ZKR DUH GHSHQGHQW RQ
NH\ERDUG RSHUDWLRQ 7KLV SURE0HP KDV EHHQ QRWLFHG DW WKH IR00RZLQJ LPSRUWDQW SRLQWV

- á   2SHUDWLQJ WKH PHQX ! QHZ SDJH FRQWHQW LV QRW GLUHFW0\ IRFXVHG
- á   6H0HFWLRQ RI UDGLR EXWWRQV ! IRFXV LV VHW WR WKH WRS RI WKH SDJH

After selecting a menu item from the navigation menu and then Loading the new pages the keyboard focus is shifted to the top of the page Screen reader users are not notified of the new content and must navigate again from the top of the page to the actual main content of the page Since the main content area is not marked as a region either the navigation menu here cannot be skipped See result

Even users with motor disabilities cannot navigate efficiently since the keyboard focus is shifted to the top of the page after selecting a menu item

Figure   Focus is not set to the content area after selecting a menu item but to the top of the page

The timestamp to be displayed can be set in the console output The various options can be selected using a radio button   When selecting an option the focus does not remain on the interactive element but is set to the top of the page

)LJXUH $IWHU VH0HFWLQJ D UDGLR EXWWRQ WKH IRFXV LV VHW WR WKH WRS RI WKH SDJH

)RU HIILFLHQW QDYLJDWLRQ WKH IRFXV VKRX0G EH RQ WKH QHZ FRQWHQW IRU G\QDPLFD00\ GLVS0D\HG FRQWHQW XVLQJ -DYD 6FULSW VR WKDW E0LQG DQG PRWRUL]HG XVHUV FDQ VHH LW GLUHFW0\

,W PDNHV VHQVH WR VHW WKH IRFXV GLUHFW0\ RQ WKH ILUVW KHDGLQJ LQ WKH QHZ FRQWHQW VR WKDW QRW VLJKWHG NH\ERDUG XVHUV LQ SDUWLFX0DU UHFHLYH DQ RULHQWDWLRQ UHIHUHQFH WR WKH QHZ FRQWHQW 7R GR WKLV WKLV KHDGLQJ PXVW D0VR EH PDGH IRFXVDE0H ZLWK WDELQGH[VR WKDW WKH IRFXV FDQ EH VHW YLD -DYD6FULSW

FRQWH[W	/HIW QDYLJDWLRQ PHQX ! VH0HFW D PHQX LWHP 8VDELOLW\ WHVW SURMHFW ' DVKERDUG ! 8VDELOLW\ IR0GHU ! 8VDELOLW\ SURMHFW ! -HQNLQV GHPR UHSRVLWRU\ ! GRFNHU EUDQFK ! %XLOG ! &RQVR0H RXWSXW ! 7LPHVWDPS UDGLR EXWWRQV
FULWHULD	)RFXV 2UGHU
XVHU JURXSV	E0LQG _ PRWRU LPSDLUHG
FDWHJRU\	LPSDLUPHQW

5HVX0W   , PSRUWDQW FRQWHQW FDQQRW EH DFFHVVHG DQG RSHUDWHG XVLQJ WKH NH\ERDUG

,QGLYLGXD0 LPSRUWDQW FRQWHQW LV RQ0\ YLVXD0L]HG DV D WRR0 WLS ZKHQ RSHUDWHG ZLWK WKH PRXVH .H\ERDUG XVHUV DQG VFUHHQ UHDGHU XVHUV WKHUHIRUH KDYH QR ZD\ RI KDYLQJ WKLV LQIRUPDWLRQ GLVS0D\HG RU UHDG RXW 7KH IR00RZLQJ H[DPS0HV VWRRG RXW

   á   : HDWKHU LFRQ LQ %UDQFKHV WDE0H D WRR0WLS DERYH WKH LFRQ VKRZV D VKRUW UHSRUW VXP PDUL]LQJ WKH UHVX0WV RI WKH 0DWHV EXL0GV

- Success message and Log file in Stage View table. The success message Success and the option to open and display the Log file are only displayed as a tooltip when using the mouse.

Figure Open Logs in Stage View table only accessible via tooltip

This means that blind users and users with motor disabilities are denied the opportunity to take a detailed look at the Log file into the build process. This is considered serious as the usability tests in particular has shown that the Log file is an important tool for users.

After opening the Log button, the Log file is displayed.

Note: The Log file is not in the correct tab order. Even if opening with the keyboard were possible, the focus must also be placed in the opened Log file.

á   /HJHQGV IRU WKH WUHQG FKDUWV ,Q WKH EUDQFK YLHZ WKH YDULRXV FKDUWV SURYLGH
GHWDL0HG LQIRU0DWLRQ DERXW WKH FRXUVH FRQFUHWH YD0XHV RI WKH YDULRXV JUDSKV DW
VSHFLILF WL0HV DQG GLVS0D\ SRS XSV WKDW FDQ RQO\ EH 0DGH YLVLE0H ZKHQ XVLQJ WKH
0RXVH

)LJXUH   /HJHQGV IRU WKH WUHQG FKDUWV RQO\ DFFHVVLEOH YLD WRRO0WLS

1RWH 7KHUH LV DQ D0WHUQDWLYH WDEX0DU SUHVHQWDWLRQ RI WKH YD0XHV IRU LQGLYLGXD0
HYD0XDWLRQV SURYLGHG WKDW WKH FRUUHVSRQGLQJ PHQX LWHPV DUH VH0HFWHG DQG GLVS0D\HG
H J % IRU &KHFN6W\0H :DUQLQJV)RU WKH UHSUHVHQWDWLRQV RI 7UHQG

of the test results and Aggregated Analysis Results this is not the case see also result

- á   Context menus offer additional options in various places but can only be operated with the mouse

Figure   Context menus within the table only accessible via tool tip

Figure   Context menus within the breadcrumb only accessible via tool tip

- á   At one point on the branch page the menu selectors are hidden even though they are there as hovering brings to view

)LJXUH   0HQX VH0HF0WRUV DUH QR0 YLVLE0H

)LJXUH   EXW0 FDQ EH RSHUD0HG ZL0K 0KH P RXVH DQG GLVS0D\ D FRQH[0 PHQX

á   ,Q WKH 6WDJH 9LHZ WKH 0LVW RI FRP PLWV FDQ RQ0\ EH YLVXD0L]HG DV D WRR0 WLS XVLQJ WKH
    PRXVH

)LJXUH   2YHUYLHZ RI FRP PLWV RQ0\ DFFHVVLE0H YLD WRR0WLS

7KH RSHUDWLRQ RI DQ DSS0LFDWLRQ VKRX0G EH HQDE0HG GHYLFH LQGHSHQGHQW 7KLV PHDQV
WKDW D00 8, H0HPHQWV PXVW EH RSHUDE0H ZLWK ERWK WKH PRXVH DQG WKH NH\ERDUG

,I LQGLYLGXD0 H0HPHQWV RQ0\ KDYH D PRXVHRYHU HYHQW WKH\ FDQQRW EH RSHUDWHG XVLQJ
WKH NH\ERDUG

$00 8, H0HPHQWV WKDW FDQ EH RSHUDWHG ZLWK WKH PRXVH PXVW D0VR EH DFFHVVLE0H ZLWK WKH
NH\ERDUG &RUUHVSRQGLQJ HYHQWV IRU NH\ERDUG RSHUDWLRQ PD\ D0VR KDYH WR EH DGGHG
IRU WKLV SXUSRVH ,Q DGGLWLRQ WKH IRFXV PDQDJHPHQW PXVW EH DGMXVWHG VR WKDW WKH
IRFXV RUGHU FRUUHVSRQGV WR WKH RUGHU RI RSHUDWLRQ

FRQWH[W   ,Q JHQHUD0 VHH H[DPS0HV

FULWHULD   .H\ERDUG 8VDEL0LW\

XVHU JURXSV   E0LQG _ PRWRU LPSDLUHG

FDWHJRU\   KXUG0H

5HVX0W   6R PH FRQWHQW LV XQXVXD00\ RSHUDE0H IRU NH\ERDUG XVHUV

2Q WKH RYHUYLHZ SDJH IRU WKH EUDQFKHV ZLWKLQ D UHSRVLWRU\ YDULRXV FRQWHQWV DUH
GLVS0D\HG LQ D WDE0H EH0RZ D WDE UHJLVWHU VWUXFWXUH 1DYLJDWLRQ LV GRQH H[F0XVLYH0\ ZLWK WKH
WDE NH\ ZKLFK PHDQV WKDW NH\ERDUG XVHUV KDYH WR QDYLJDWH WKURXJK D00 WDE UHJLVWHUV WR
JHW WR WKH FRQWHQW LQ WKH WDE SDQH0V 7KLV ZD\ RI QDYLJDWLQJ LV QRW HIILFLHQW

)LJXUH   8QXVXD0 NH\ERDUG QDYLJDWLRQ EHWZHHQ WDEV

7KH WDE UHJLVWHUV DUH XVXD00\ RSHUDWHG ZLWK WKH NH\ERDUG LQ VXFK D ZD\ WKDW WKH ILUVW
UHJLVWHU LV IXPSHG WR ZLWK WKH WDE0DWRU NH\ QDYLJDWLRQ EHWZHHQ WKH WDE UHJLVWHUV LV
FDUULHG RXW ZLWK WKH DUURZ NH\V ZKL0H FKDQJLQJ WR WKH DVVRFLDWHG WDE SDQH0 ZLWK WKH
WDE0DWRU NH\ EXWWRQ LV GRQH 7KLV D00RZV HIILFLHQW QDYLJDWLRQ EHWZHHQ WKH WDE
UHJLVWHUV DQG WKH FRUUHVSRQGLQJ WDE SDQH0V DQG WKH WDE RUGHU LV FRQVLVWHQW

1RWH 6FUHHQ UHDGHU XVHUV FDQQRW SHUFHLYH WKH UR0HV RI WKH WDE UHJLVWHUV FRUUHFW0\ DV WKH
LPS0HPHQWDWLRQ XVHV LQSXW ILH0GV RI W\SH 5DGLR ZLWK LQWHJUDWHG 0LQNV 6HH D0VR UHVX0W

)RU D EDUULHU IUHH LPS0HPHQWDWLRQ RI WDE UHJLVWHUV ERWK WKH UR0HV DWWULEXWHV DQG LQ
SDUWLFX0DU WKH NH\ERDUG RSHUDWLRQ PXVW EH FRQYHUWHG WR WDEV LQ DFFRUGDQFH ZLWK WKH : $,
$5,$ $XWKRULQJ 3UDFWLFHV

FRQWH[W   8VDEL0LW\ WHVW SURMHFW 'DVKERDUG ! 8VDEL0LW\ IR0GHU ! 8VDEL0LW\
                   SURMHFW ! -HQNLQV GHPR UHSRVLWRU\ ! 7DE UHJLVWHU

FULWHULD   )RFXV 2UGHU

XVHU JURXSV   E0LQG _ PRWRU LPSDLUHG

FDWHJRU\   LPSDLUPHQW

5HVX0W 2ULHQWDWLRQ DQG QDYLJDWLRQ LQ WKH DSS0LFDWLRQ DUH PRUH GLIILFX0W

: LWKLQ WKH DSS0LFDWLRQ XVHUV FDQ HDVL0\ 0RVH WKHLU EHDULQJV DV WKH XVDEL0LW\ VWXG\ D0VR VKRZHG ' HWDL0V FDQ D0VR EH IRXQG LQ WKH XVDEL0LW\ UHSRUW LQ UHVX0W ZKHUH WKH YDULRXV UHDVRQV DUH H[S0DLQHG LQ PRUH GHWDL0

)URP WKH SRLQW RI YLHZ RI DFFHVVLELOLW\ WZR DVSHFWV DUH GHFLVLYH

- á +HDGLQJV WKDW GRQ W IR00RZ D F0HDU FRQYHQWLRQ DQG DUH WKHUHIRUH QRW PHDQLQJIX0 EHFDXVH WKH\

  - á RQ WKH RQH KDQG DUH HLWKHU GHSHQGHQW RQ WKH FRQWHQW DQG ZLWKRXW DQ DGGLWLRQ WR UHIHU WR WKH UHVSHFWLYH 0HYH0 H J %)R0GHU QDPH! 3URMHFW QDPH! 5HSRVLWRU\ QDPH! WKHVH FDQ D0VR EH WKH VDPH ZKLFK FDQ FRQWULEXWH WR LUULWDWLRQ

  - á RQ WKH RWKHU KDQG WKH\ DUH IL[HG ZLWKRXW D UHIHUHQFH WR WKH FRQWH[W RU WKH 0HYH0 KHUH EXL0G H J % &RQVR0H 2XWSXW

  - á RU WKH KHDGLQJ DV DQ DGGLWLRQ WKH UHVSHFWLYH 0HYH0 LV 0LVWHG IRU RULHQWDWLRQ H J % %UDQFK EUDQFK QDPH!

- á WKH QRQ XQLIRUP0\ VWUXFWXUHG PHQX ZKLFK GRHV QRW VHSDUDWH JHQHUD0 IXQFWLRQV IURP VSHFLILF RSWLRQV RI WKH GLIIHUHQW 0HYH0V DQG WKXV EHFRPHV FRQIXVLQJ

)LJXUH &RQIXVLQJ QDYLJDWLRQ PHQX KHUH EUDQFK 0HYH0 YV EXL0G 0HYH0

7KH SDWK LQIRUPDWLRQ SURYHV WR EH KH0SIX0 IRU RULHQWDWLRQ

However, orientation is also made more difficult if, as can be seen in the figure, content happens to have the same name.

These problems make orientation and navigation considerably more difficult especially for blind users who cannot use any visual orientation options, but who rely on the linear output of the screen reader, and represent an obstacle when using the application.

The headings should be clearer and better structured, e.g. B by always naming the level first and then the description of the content.

The menus on the left should be better structured and designed more clearly, see also result   in the usability report for further details.

context	General Left side navigation menu
criteria	Consistent Navigation
	Descriptions
user groups	blind people
category	hurdle

Result   The focus order is not logical in some places

On the "Settings" page in the user profile and on the "Configure" page help icons are offered for many input fields, which provide more detailed information on the fields. These icons are at the top of the focus order and are jumped to one after the other regardless of the associated input fields when navigating with the keyboard. This means that there is no connection to the corresponding form fields and blind users in particular cannot establish a connection between the icons and the form fields.

A coherent focus order is imperative so that keyboard users and screen reader users can navigate within the application in a comprehensible manner

The focus order on the Settings pages below the user profile and Configure needs to be revised so that the help icons are jumped to immediately after the form elements to which they are assigned

context	User Profile ! Settings
	Test project Usability Dashboard ! Usability folder ! Usability project ! Configure
criteria	Focus Order
user groups	blind _ motor impaired
category	hurdle

Semantic Labeling of UI Elements

Finding   Individual visual headings are not semantically structured

Most of the existing visual headings are also semantically marked as such

2Q D00 SDJHV RQ ZKLFK WKH 0LVW RI WRR0V XVHG LV JLYHQ ZLWK WKH UHVSHFWLYH YHUVLRQ QXPEHUV WKH KHDGLQJ 7RR0V LV RQ0\ YLVXD00\ PDUNHG

7KLV PHDQV WKDW WKH FRQWHQW FDQQRW EH VWUXFWXUD00\ XQGHUVWRRG E\ E0LQG XVHUV DQG PD\ QRW EH QRWLFHG

)LJXUH 9LVXD0 KHDG0LQH QRW VH PDQWLFD00\ VWUXFWXUHG

7KDQNV WR WKH YLVXD0 VWUXFWXULQJ RI WKH KHDGLQJV LQ WKH DSS0LFDWLRQ WKH VLJKWHG XVHU NQRZV ZKDW EH0RQJV WRJHWKHU FDQ HDVL0\ VXUYH\ WKH FRQWHQW RI WKH ZHEVLWH DQG DFFHVV LW LQ D WDUJHWHG PDQQHU %0LQG XVHUV RU XVHUV XVLQJ PDJQLILFDWLRQ VRIWZDUH UH0\ RQ WKH VWUXFWXUH EHLQJ DFFHVVLE0H DQG XVDE0H UHJDUG0HVV RI ZKDW LV GLVS0D\HG RQ WKH VFUHHQ 7KH XVH RI KHDGLQJ H0HPHQWV LV DQ HVVHQWLD0 SUHUHTXLVLWH IRU WKLV

7KH KHDGLQJ VWUXFWXUH RQ WKH PDLQ SDJHV VKRX0G EH FKHFNHG DQG FRUUHFWHG $WWHQWLRQ VKRX0G EH SDLG WR WKH PDUNLQJ RI D00 YLVXD0 KHDGLQJV DQG WKH FRUUHFW QHVWLQJ RI WKH H0HPHQWV K ! WR K !

7KH 7RR0V KHDGLQJ VKRX0G EH PDUNHG ZLWK WKH K! H0HPHQW RQ D00 SDJHV DFFRUGLQJ WR WKH KLHUDUFK\

FRQWH[W	*HQHUD0 ! +HDGLQJV
FULWHULD	,QIRUPDWLRQ DQG 5H0DWLRQVKLSV
XVHU JURXSV	E0LQG SHRS0H
FDWHJRU\	LPSDLUPHQW

5HVX0W 7DEV FDQQRW EH SHUFHLYHG DV VXFK E\ WKH E0LQG

7KH WDEV RQ WKH RYHUYLHZ SDJH IRU WKH EUDQFKHV DUH QRW SHUFHSWLE0H DV VXFK E\ VFUHHQ UHDGHU XVHUV

7KH UHDVRQ LV WKDW LQVWHDG RI WKH FRUUHFW UR0HV WR EH GHILQHG ZLWK $5,$ LQSXW ILH0GV RI WKH 5DGLR W\SH ZLWK LQWHJUDWHG 0LQNV DUH XVHG 6FUHHQ UHDGHU XVHUV WKHUHIRUH KDYH D GLIIHUHQW LGHD RI WKH VWUXFWXUH RI WKH LQIRUPDWLRQ SUHVHQWHG DQG PD\ QRW EH DE0H WR SHUFHLYH LW FRUUHFW0\ .H\ERDUG RSHUDWLRQ LV D0VR GLIIHUHQW WKDQ XVXD0 IRU UHJLVWHU QDYLJDWLRQ 6HH D0VR UHVX0W

1RWH 7DE UHJLVWHUV DOVR H[LVW RQ RWKHU SDJHV EXW XVXDOO\ RQO\ ZLWK RQH WDE +HUH WRR LPSOHPHQWDWLRQ ZLWK WKH DSSURSULDWH UROHV ZRXOG PDNH VHQVH VR WKDW VFUHHQ UHDGHU XVHUV EHQHILW IURP XQLIRUP QDYLJDWLRQ ZLWKLQ WDE UHJLVWHUV

)RU D EDUULHU IUHH LPSOHPHQWDWLRQ RI WDE UHJLVWHUV ERWK WKH UROHV DWWULEXWHV DQG LQ SDUWLFXODU WKH NH\ERDUG RSHUDWLRQ PXVW EH FRQYHUWHG WR WDE LQ DFFRUGDQFH ZLWK WKH : $, $5,$ $XWKRULQJ 3UDFWLFHV 6HH DOVR UHVXOW

FRQWH[W	8VDELOLW\ WHVW SURWHFW 'DVKERDUG ! 8VDELOLW\ IROGHU ! 8VDELOLW\ SURWHFW ! -HQNLQV GHPR UHSRVLWRU\ ! GRFNHU EUDQFK
FULWHULD	1DPH 5ROH 9DOXH
XVHU JURXSV	EOLQG SHRSOH
FDWHJRU\	LPSDLUPHQW

5HVXOW   7DEOH FRQWHQWV FDQ SDUWO\ DUH QRW FRUUHFWO\ SHUFHLYHG

7KH VHPDQWLF VWUXFWXUH RI WKH PDLQ WDEOH RQ DOO SDJHV LV FRPSOHWH DQG FDQ EH ZHOO SHUFHLYHG

,Q VRPH SODFHV KRZHYHU QRW DOO WDEOH FROXPQV RI WKH PDLQ WDEOH DUH ODEHOHG 7KLV PDNHV RULHQWDWLRQ DQG QDYLJDWLRQ ZLWKLQ WKH WDEOHV PRUH GLIILFXOW HVSHFLDOO\ IRU EOLQG XVHUV <RX FDQ RQO\ ZRUN RXW E\ UHDGLQJ WKH FRQWHQWV DQG WKH ODFN RI FRUUHVSRQGLQJ WDEOH FRQWHQWV IRU WKH HPSW\ FROXPQ KHDGLQJV WKDW WKH WDEOH LV QRW FRPSOHWHO\ ILOOHG

%XW D FRPS0HWH 0DEH0LQJ RI D00 H[LVWLQJ FR0XPQV LV D0VR YHU\ KH0SIX0 IRU XVHUV ZLWK
QRUP D0 YLVLRQ HYHQ LI WKHUH LV QR FRQWHQW LQ LQGLYLGXD0 WDE0H FH00V LQ FHUWDLQ YLHZV
VLWXDWLRQV 2WKHUZLVH WKHVH FR0XPQV FRX0G D0VR EH KLGGHQ +RZHYHU D FRQVLVWHQW
GLVS0D\ D0VR RI HPSW\ FR0XPQV EXW ZLWK FR0XPQ 0DEH0V   LV WR EH SUHIHUUHG

2Q WKH IR00RZLQJ SDJHV LQGLYLGXD0 FR0XPQ 0DEH0V DUH PLVVLQJ ZLWKLQ WKH GLVS0D\HG WDE0H

)LJXUH   0LVVLQJ FR0XPQ 0DEH0   ([DPS0H 'DVKERDUG ! 7DE0H

)LJXUH   0LVVLQJ FR0XPQ 0DEH0   ([DPS0H 7HVW 3URMHFW 8VDELOLW\ 'DVKERDUG ! 8VDELOLW\ IR0GHU ! 7DE0H

)LJXUH   0LVVLQJ FR0XPQ 0DEH0   ([DPS0H 'DVKERDUG ! 8VDELOLW\ IR0GHU ! 8VDELOLW\ SURMHFW ! 7DE0H

9LVXD00\ RULHQWHG SHRS0H XVH WKH YD0XH UDQJH DV ZH00 DV WKH KHDGLQJV IRU RULHQWDWLRQ LQ
D GDWD WDE0H ,W LV WKHUHIRUH UH0DWLYH0\ HDV\ IRU WKHP WR UHFRJQL]H VWUXFWXUD0 GHIHFWV
VXFK DV FKDQJHV LQ WKH PHDQLQJ RI URZV RU FR0XPQV DQG WR GHD0 ZLWK WKHP 9LVXD00\
LPSDLUHG DQG E0LQG XVHUV RQ WKH RWKHU KDQG DFFHVV WKH GDWD WDE0HV PRUH DQD0\WLFD00\
7KH\ GHYH0RS DQ LGHD RI WKH VWUXFWXUH RI WKH WDE0H EDVHG RQ WKH KHDGLQJV DQG RWKHU
LQIRUPDWLRQ DYDL0DE0H LQ WKH FRQWH[W 7KLV LGHD LV WKH EDVLV IRU DFFHVVLQJ WKH GDWD
RIIHUHG

,W LV UHFRP PHQGHG WKDW D00 FR0XPQ KHDGLQJV EH 0DEH00HG

,I WKHUH LV D FRPSUHKHQVLE0H UHDVRQ ZK\ WKH FR0XPQ QDPHV DUH QRW DVVLJQHG E0LQG
XVHUV FDQ D0WHUQDWLYH0\ D0VR XVH FRUUHVSRQGLQJ YLVXD0 QDPHV

+LGGHQ LQIRUPDWLRQ LQ WKH FR0XPQ KHDGLQJV LV DGGHG ZKLFK LV SXVKHG LQWR WKH LQYLVLE0H DUHD ZLWK &66 RU UHGXFHG WR SL[H0 DQG LV QRW YLVLE0H WR VLJKWHG XVHUV 7KLV D00RZV E0LQG XVHUV WR EHWWHU RULHQWDWH WKHPVH0YHV ZLWKLQ WKH WDE0H

,Q WKH WDE0HV VKRZQ DERYH LQGLYLGXD0 FR0XPQV DUH D0VR QRW PHDQLQJIX00\ QDPHG WKLV DSS0LHV WR WKH FR0XPQV 6 : DQG)DY

)LJXUH $EEUHYLDWHG QRQ VH0I GHVFULSWLYH FR0XPQ KHDGLQJV (D[DPS0H 'DVKERDUG ! 8VDEL0LW\ IR0GHU ! 8VDEL0LW\ SURMHFW !
7DE0H

)RU VRPH QRW D00 DEEUHYLDWLRQV H[S0DQDWLRQV DUH GLVS0D\HG YLD WRR0WLS DV VKRZQ LQ WKH IR00RZLQJ ILJXUH

)LJXUH (D[S0DQDWLRQ RI : GLVS0D\HG RQ PRXVH RYHU (D[DPS0H 'DVKERDUG ! 8VDEL0LW\ IR0GHU ! 8VDEL0LW\ SURMHFW ! 7DE0H

+RZHYHU LW LV VWL00 QRW F0HDU IURP WKLV ZK\ %ULHI UHSRUW VXPPDUL]LQJ WKH UHVX0WV RI WKH 0DWHV EXL0G LV DEEUHYLDWHG WR :

$V WKH XVDEL0LW\ VWXG\ UHYHD0HG HYHQ H[SHULHQFHG XVHUV GR QRW NQRZ ZKDW WKHVH DEEUHYLDWLRQV PHDQ

$EEUHYLDWLRQV VKRX0G EH DYRLGHG HVSHFLD00\ ZKHQ WKHUH LV HQRXJK VSDFH IRU IX00 QDPHV

,I WRR0WLSV DUH VKRZQ WR H[S0DLQ WKH\ VKRX0G D0VR H[S0DLQ KRZ WKH DEEUHYLDWLRQ LV GHULYHG VR WKDW XVHUV FDQ PRUH HDVL0\ UHPHPEHU WKH PHDQLQJ

,W PXVW D0VR EH HQVXUHG WKDW WRR0WLSV DUH D0VR DFFHVVLE0H WR XVHUV ZLWK PRWRU GLVDEL0LWLHV L H WKH\ FDQ D0VR EH RSHUDWHG ZLWK WKH NH\ERDUG

7KH VWDJH YLHZ WDEOH ZLWKLQ WKH EUDQFK YLHZ LV D0VR QRW HDV\ IRU E0LQG XVHUV WR XQGHUVWDQG : KL0H WKH LQGLYLGXD0 VWDJHV DUH FRUUHFW0\ PDUNHG DV KHDGLQJV WKH HQWULHV LQ WKH ILUVW FR0XPQ IRU WKH UHVSHFWLYH URZV DUH KHDGLQJV VLQFH WKH GDWD SHU VWDJH LV VKRZQ LQ WKH WDE0H IRU HDFK EXL0G 7KH WDE0H WKXV KDV ERWK FR0XPQ KHDGLQJV IRU WKH LQGLYLGXD0 VWDJHV DQG URZ KHDGLQJV IRU WKH LQGLYLGXD0 EXL0GV

7KLV VWUXFWXUH LV QRW PDSSHG ZLWKLQ WKH WDE0H PDNLQJ LW GLIILFX0W IRU E0LQG XVHUV WR JUDVS WKH WDE0H VWUXFWXUH

)LJXUH   0LVVLQJ KHDG0LQH PDUNXS (;DPS0H 'DVKERDUG ! 8VDEL0LW\IR0GHU ! 8VDEL0LW\SURIHFW ! HHQNLQV

GHPR ! %UDQFK GRFNHU %UDQFK 9LHZ 7DE0H 6WDJH 9LHZ

$00 WDE0H FH00V WKDW UHSUHVHQW D KHDGLQJ IRU D JURXS RI FH00V PXVW EH PDUNHG ZLWK WK! DQG DQ DGGLWLRQD0 VFRSH DWWULEXWH ,Q WKH KHDGHU URZ VFRSH FR0 DVVRFLDWHV HDFK KHDGHU FH00 ZLWK HDFK GDWD FH00 LQ WKH FRUUHVSRQGLQJ FR0XPQ ZKL0H LQ WKH KHDGHU FR0XPQ VFRSH URZ DVVRFLDWHV HDFK KHDGHU FH00 ZLWK HDFK GDWD FH00 LQ WKH FRUUHVSRQGLQJ URZ

7KH HPSW\ FH00 LQ WKH ILUVW FR0XPQ URZ LV WUHDWHG DV DQ HPSW\ GDWD FH00
WG! WG!

(0VHZKHUH WKH VWUXFWXUH RI WKH EXL0G SURFHVVRU VWDWXV WDE0H FDQQRW EH SHUFHLYHG FRUUHFW0\

6WUXFWXUH H0HPHQWV DUH XVHG IRU GDWD WDE0HV D0WKRXJK LW DSSHDUV WR EH D 0D\RXW WDE0H 7KLV LV LQGLFDWHG E\ WKH PLVVLQJ FR0XPQ KHDGLQJV 7KH YLVXD0 KHDGLQJ D0VR D 0LQN LV PDUNHG ZLWK D WK! H0HPHQW ZKLFK VKRX0G RQ0\ EH XVHG IRU RQH FR0XPQ RU RQH URZ +HUH WKH KHDGLQJ VHHPV WR KDYH PRUH RI WKH IXQFWLRQ RI D WDE0H KHDGLQJ ZKLFK VKRX0G WKHQ EH PDUNHG ZLWK FDSWLRQ! LQVWHDG 7KH WZR HPSW\ FR0XPQV D0VR LQGLFDWH WKDW D WDEX0DU 0D\RXW LV WKH JRD0 RI XVLQJ WKH WDE0H VWUXFWXUH H0HPHQWV

'HWDL0V FDQ EH IRXQG IRU H[DPS0H LQ WKH : $, WXWRULD0 RQ WDE0HV KWWSV ZZZ RUJ : $, WXWRULD0V WDE0HV WZR KHDGHUV

,W VKRXOG EH FKHFNHG ZKHWKHU RQO\ D WDEOEDU 0D\RXW LV DFWXDOO\ GHVLUHG DW WKLV SRLQW WR SUHVHQW WKH GDWD 7KH SUHVHQWDWLRQ RI D GDWD WDEOH GRHV QRW VHHP QHFHVVDU\ DW WKLV SRLQW ,Q WKLV FDVH WKH HQWLUH WDEOH VKRXOG EH KLGGHQ IURP VFUHHQ UHDGHU XVHUV ZLWK UROH SUHVHQWDWLRQ DQG WKH WK! HOHPHQW IRU WKH YLVLEOH KHDGLQJ VKRXOG EH UHPRYHG

2WKHUZLVH LI WKH LQIRUPDWLRQ LV WR EH SUHVHQWHG DV D GDWD WDEOH DOO FROXPQV VKRXOG EH SURYLGHG ZLWK WK! HOHPHQWV DQG DSSURSULDWH 0DEHOV 7KH VGF0RXG MHQNLQV   OLQN VKRXOG WKHQ EH PDUNHG ZLWK FDSWLRQ! DV WKH WDEOH KHDGHU

/D\RXW WDEOEHV VKRXOG JHQHUD00\ EH PDUNHG ZLWK UROH SUHVHQWDWLRQ 7KLV I0DJ KLGHV WKH WDEOH VWUXFWXUH IRU VFUHHQ UHDGHU XVHUV

FRQWH[W   8VDELOLW\ 7HVW 3URMHFW 'DVKERDUG ! 8VDELOLW\ )ROGHU ! 8VDELOLW\ 3URMHFW ! 7DEOH RQ D00 VXESDJHV ZLWK HPSW\ FROXPQ KHDGHUV 8VDELOLW\ 7HVW 3URMHFW 'DVKERDUG ! 8VDELOLW\ )ROGHU ! 8VDELOLW\ 3URMHFW ! 5HSRVLWRU\ MHQNLQV GHPR ! %UDQFK GRFNHU   %UDQFK 9LHZ 7DEOH 6WDJH 9LHZ

8VDELOLW\ WHVW SURMHFW 'DVKERDUG ! 8VDELOLW\ )ROGHU ! 8VDELOLW\ SURMHFW ! MHQNLQV GHPR UHSRVLWRU\ !

7HVW 3URMHFW 8VDELOLW\ 'DVKERDUG ! %XL0G 3URFHVVRU 6WDWXV WDEOH LQ 0HIW VLGH PHQX

FULWHULD   ,QIRUPDWLRQ DQG 5H0DWLRQVKLSV
                           'HVFULSWLRQV

XVHU JURXSV   E0LQG SHRS0H

FDWHJRU\   KXUG0H

)LQGLQJ   0DQ\ 0LQNHG 8,(0HPHQWV DUH QRW &OHDUO\ LGHQWLILHG

0DQ\ 0LQNHG 8,(0HPHQWV DUH QRW 0DEHOHG DFFHVVLE0H VR WKH\ DUH QRW &OHDUO\ SHUFHSWLE0H WR VFUHHQ UHDGHU XVHUV 7KHVH DUH PRVW0\ 0LQNHG JUDSKLFV

7KH IR00RZLQJ H[DPS0HV VWRRG RXW

- á 7KH IRQW JUDSKLF -HQNLQV LQ WKH KHDGHU LV RQ0\ DVVLJQHG WKH D0WHUQDWLYH WH[W -HQNLQV ZKLFK GRHV QRW &OHDU0\ LGHQWLI\ WKH 0LQN WDUJHW VLQFH WKH 0LQN WR WKH KRPH SDJH LV QRW FRPPXQLFDWHG

)LJXUH   /LQNHG JUDSKLF QRW PHDQLQJIX00\ QDPHG H[DPS0H)RQW JUDSKLF -HQNLQV LQ WKH KHDGHU

,Q WKH 0LQNHG JUDSKLF LQ WKH KHDGHU WKH 0LQN WDUJHW VKRX0G EH FRUUHFW0\ VSHFLILHG DV -HQNLQV +RPH

- á 7KH KH0S LFRQ ZLWKLQ WKH SURPLQHQW VHDUFK ILH0G LQ WKH KHDGHU 0DFNV D &OHDU QDPH

7KH KH0S LFRQ LV D 0LQNHG VYJ JUDSKLF GHVLJQHG IRU VFUHHQ UHDGHU
8VHUV ZLWK UHGLUHFW VHDUFK ER[LV LVVXHG 7KLV LV QRW D PHDQLQJIX0 0LQN QDPH

)LJXUH   /LQNHG JUDSKLF QRW &OHDU0\ 0DEHOHG H[DPS0H +H0S LFRQ LQ WKH VHDUFK ILH0G

$ 0LQN QDPH PXVW EH DVVLJQHG WKDW &OHDU0\ LGHQWLILHV WKH 0LQN WDUJHW H J %   ,QIRUPDWLRQ DERXW WKH VHDUFK ILH0G

- á 7KH 0LQN QDPH *LW %XL0G 'DWD LV XVHG VHYHUD0 WLPHV EXW KDV GLIIHUHQW 0LQN WDUJHWV

)LJXUH $PELJXRXV 0LQN 0DEH0 LQ WKH PHQX H[DPS0H EXL0G SDJH

' XS0LFDWH 0LQN QDPHV VKRX0G EH DYRLGHG $ 0LQN QDPH PXVW EH DVVLJQHG WKDW F0HDU0\ LGHQWLILHV WKH 0LQN WDUJHW H J)RU H[DPS0H *LW %XL0G ' DWD 0DVWHU %UDQFK DQG *LW %XL0G ' DWD ' RFNHU %UDQFK

á   : LWKLQ WKH WDE0HV WKHUH DUH RQH RU PRUH HPSW\ FR0XPQV ZLWKRXW FR0XPQ KHDGLQJV EXW HDFK KDV D 0LQN EHKLQG LW $W WKHVH SRLQWV RQ0\   LV DQQRXQFHG IRU VFUHHQ UHDGHU XVHUV

)LJXUH   (PSW\ 0LQNHG FR0XPQ KHDGLQJV H[DPS0H SURWHIFWDE0H

,I WKHVH HPSW\ FR0XPQV LQ WKLV YLHZ DUH QRW UHTXLUHG WKH\ VKRX0G EH KLGGHQ G\QDPLFD00\ VR WKDW VFUHHQ UHDGHU XVHUV DUH QRW FRQIXVHG E\ PLVVLQJ LQIRUPDWLRQ RU LQFRUUHFW VWUXFWXUHV 2WKHUZLVH WKH FR0XPQV VKRX0G EH 0DEH0HG FRUUHFW0\ 6HH UHVX0W WDE0H VWUXFWXUH

1RWH ' HVFULSWLYH FR0XPQ QDPHV DUH D0VR KH0SIX0 IRU VLJKWHG XVHUV ULFK DQG VHUYH DV D JRRG RULHQWDWLRQ ZLWKLQ WKH WDE0H

á   7KH VRUWLQJ DUURZ ZLWKLQ WKH FR0XPQ KHDGLQJV LV QRW PDUNHG $UURZ XS RU $UURZ GRZQ LV GLVS0D\HG IRU VFUHHQ UHDGHU XVHUV

7KH VRUWLQJ IXQFWLRQ LV DYDL0DE0H IRU VFUHHQ UHDGHU XVHUV ZLWK WKH KH0S RI WKH $5,$ DWWULEXWHV DULD

VRUW DVFHQGLQJ RU DULD VRUW GHVFHQGLQJ 7KH 0LQNHG JUDSKLF WKH VRUWLQJ DUURZ LWVH0I LV IRU VFHHQ UHDGHU XVHUV H J % ZLWK WKH KH0S RI DULD KLGGHQ VLQFH WKH VRUWLQJ IXQFWLRQ LV RXWSXW YLD WKH DULD VRUW DWWULEXWH

7R RSHUDWH WKH VRUWLQJ IXQFWLRQ WKH FR0XPQ KHDGLQJV ZLWK UR0 EXWWRQ VKRX0G EH JLYHQ WKH UR0 RI D EXWWRQ WR PDNH LW F0HDU WR XVHUV WKDW D IXQFWLRQ LV WULJJHUHG DQG WKDW WKH 0LQN ZL00 QRW WDNH WKHP WR DQRWKHU SDJH

á 7KH IDYRULWHV LFRQ ZLWK ZKLFK DQ HQWU\ FDQ EH PDGH D IDYRULWH RU WKLV SURFHVV FDQ EH XQGRQH LV QRW 0DEH0HG 7KH 0LQN QDPH LV RQ0\ GLVS0D\HG ZLWK IRU VFUHHQ UHDGHU XVHUV

)LJXUH 8QWLW0HG IDYRULWHV LFRQ H[DPS0H SURWHFW WDE0H

7KH 0LQNHG LFRQ PXVW EH JLYHQ D PHDQLQJIX0 DULD 0DEH0 GHSHQGLQJ RQ WKH WRJJ0H VWDWH RI WKH LFRQ H J % $GG IDYRULWH RU 5HPRYH IDYRULWH ,QVWHDG RI D 0LQN WKH LFRQ VKRX0G EH PDUNHG DV D EXWWRQ VLQFH D IXQFWLRQ LV H[HFXWHG ZLWK WKH LFRQ

á 7KH 0LQNHG LFRQV IRU FR00DSVLQJ DQG H[SDQGLQJ GHWDL0V LQ WKH 0RZHU DUHD RI WKH VLGHEDU DUH QRW F0HDU0\ 0DEH0HG ,W LV QRW F0HDU ZKLFK DUHD FDQ EH H[SDQGHG RU FR00DSVHG

7KH &R00DSVH DQG ([SDQG 0LQNV 0DFN D PHDQLQJIX0 GHVLJQDWLRQ DQG WKH FRUUHFW UR0H DQG LQIRUPDWLRQ DERXW WKH IDFW WKDW F0LFNLQJ RQ WKH 0LQN PDNHV IXUWKHU HQWULHV YLVLE0H RU F0RVHV WKHP DJDLQ

6LQFH WKH 0LQNV GR QRW 0HDG WR DQRWKHU SDJH EXW SHUIRUP D IXQFWLRQ WKH FRUUHFW UR0H LV EXWWRQ ZKLFK PXVW EH FRQYH\HG HLWKHU GLUHFW0\ ZLWK WKH EXWWRQ! H0HPHQW RU ZLWK UR0H EXWWRQ ,Q RUGHU IRU WKH EXWWRQ QDPH WR EH PHDQLQJIX0 WKH WH[W EXL0G TXHXH RU RSHQ EXL0G SURFHVVRU VWDWXV VKRX0G EH FRQYH\HG ZLWK DQ DULD0DEH0 7KH DULD H[SDQGHG DWWULEXWH LQGLFDWHV WKDW DGGLWLRQD0 FRQWHQW LV GLVS0D\HG RU KLGGHQ E\ FRQILUPLQJ WKH EXWWRQ

2Q WKH SHUVRQD0 VHWWLQJV SDJH ERWK WKH KH0S LFRQV DQG WKH IDYRULWHV LFRQV DUH QRW 0DEH0HG ZLWK DQ DFFHVVLE0H QDPH VR RQ0\   VLJQV DUH RXWSXW IRU VFUHHQ UHDGHU XVHUV

7KH KHOS LFRQV QHHG DFFHVVLEOH ODEHOV ZKLFK FDQ EH DVVLJQHG XVLQJ DULD ODEHO

FRQWH[W	+HDGHU ! 6HDUFK)LHOG ! +HOS ,FRQ
	7DE0HV RQ D00 SDJHV ZKHUH WDE0HV DUH GLVS0D\HG ! HPSW\ 0LQNHG FR0XPQ KHDGLQJV
	%XL0G SDJH ! 0HIW VLGH PHQX ! GXS0LFDWH PHQX LWHPV WDE0HV ! IDYRULWHV LFRQ
	6LGHEDU ! /LQNV WR H[SDQG DQG FR00DSVH VHFWLRQV 8VHU PHQX ! 6HWWLQJV ! +H0S LFRQ
	8VDELOLW\ WHVW SURIHFW 'DVKERDUG ! 8VDELOLW\ IR0GHU ! 8VDELOLW\ SURIHFW ! &RQILJXUH ! +H0S ,FRQV
FULWHULD	3XUSRVH RI D 0LQN LQ FRQWH[W
	1DPH 5R0H 9D0XH
XVHU JURXSV	E0LQG SHRS0H
FDWHJRU\	KXUG0H

5HVX0W   )RUP FDSWLRQV DUH H J 7 QRW SURJUDP PDWLFD00\ GHWHU PLQHG

,Q -HQNLQV WKHUH DUH UH0DWLYH0\ IHZ IRUP H0HPHQWV DSDUW IURP WKH VHDUFK ILH0GV LQ WKH
KHDGHU DQG LQ WKH %XL0G +LVWRU\ WDE0H RQ WKH EUDQFK SDJH DQG RQ WKH SHUVRQD0 VHWWLQJV
SDJH LQ WKH XVHU SURIL0H

 : LWKLQ WKH SHUVRQD0 VHWWLQJV KRZHYHU PRVW RI WKH 0DEH0V RQ WKH LQSXW ILH0GV VH0HFWLRQ
0LVWV DQG WKH H[LVWLQJ FKHFNER[HV DUH QRW DFFHVVLE0H WR VFUHHQ UHDGHU XVHUV

7KLV LV EHFDXVH WKHVH 0DEH0V DUH HLWKHU QRW GHILQHG DV 0DEH0! DW D00 RU WKH 0DEH0!
H0H0HQW LV QRW DVVRFLDWHG ZLWK WKH FRUUHVSRQGLQJ IRUP H0H0HQWV

,Q VRPH FDVHV WKH VFUHHQ UHDGHU VWL00 RXWSXWV VRPH FDSWLRQV D0WKRXJK WKH 0LQNV WR WKH
IRUP H0H0HQWV DUH QRW JLYHQ

)LJXUH   /DEH0V DUH QRW UHFRJQL]HG E\ WKH VFUHHQ UHDGHU H[DPS0H SHUVRQD0 VHWWLQJV SDUW

)LJXUH   /DEH0V DUH QRW UHFRJQL]HG E\ WKH VFUHHQ UHDGHU H[DPS0H SHUVRQD0 VHWWLQJV SDUW

8VHUV ZLWK UHVWULFWHG PRWRU VNL00V DUH 0LPLWHG LQ WKH VL]H RI WKH F0LFN DUHD IRU WKH IRUP ILH0G
GXH WR WKH PLVVLQJ 0LQN EHWZHHQ WKH 0DEH0 DQG WKH IRUP ILH0G

/LQNLQJ 0DEH0V WR WKHLU DVVRFLDWHG IRUP ILH0GV WKURXJK WKH
0DEH0 H0H0HQW HQVXUHV WKDW WKH 0D\RXW RI D SDJH LV IL[HG DQG DFFHVVLE0H UHJDUG0HVV RI
WKH SUHVHQWDWLRQ $ XQLTXH UH0DWLRQVKLS EHWZHHQ WKH IRUP ILH0G DQG WKH 0DEH0 LV
HVWDE0LVKHG YLD WKH 0DEH0! H0H0HQW ZKLFK LV 0LQNHG WR WKH 0DEH0 YLD WKH IRU DWWULEXWH
WKLV PDNHV SRVVLE0H

á   6FUHHQ UHDGHUV WR UHDG WKH DVVRFLDWHG FDSWLRQV IRU D ILH0G DV WKH XVHU QDYLJDWHV
WKURXJK WKH IRUP H0H0HQWV

- $00RZ PRXVH XVHUV WR VHW IRFXV LQ WKH DVVRFLDWHG IRUP H0HPHQW ZKHQ WKH\ F0LFN WKH 0DEH0 DQG

- WKH KLJK0LJKWLQJ RI WKH FXUUHQW0\ DFWLYH 0DEH0

$00 IRUP ILH0GV VXFK DV LQSXW ILH0GV FKHFNER[HV DQG VH0HFWLRQ 0LVWV PXVW EH DSSURSULDWH0\ 0DEH0HG ZLWK D 0DEH0! H0HPHQW DQG WKLV PXVW EH 0LQNHG WR WKH IRUP ILH0G XVLQJ WKH IRU DWWULEXWH ,Q WKLV ZD\ D F0HDU DVVLJQPHQW FDQ EH PDGH E\ WKH VFUHHQ UHDGHU DQG WKH F0LFN DUHD LV H[SDQGHG IRU XVHUV ZLWK 0LPLWHG PREL0LW\

: KL0H PRVW IRUP ILH0GV KDYH D YLVLE0H 0DEH0 WKH VHDUFK ILH0GV LQ WKH KHDGHU DQG LQ WKH %XL0G +LVWRU\ WDE0H RQ WKH EUDQFK SDJH 0DFN D YLVLE0H 0DEH0 LQVWHDG XVLQJ D S0DFHKR0GHU LQ WKH LQSXW ILH0G DV D UHS0DFHPHQW 0DEH0 +RZHYHU XVLQJ S0DFHKR0GHU DWWULEXWHV IRU LQSXW ILH0GV LV SURE0HPDWLF IRU D00 XVHUV EHFDXVH WKH\ GLVDSSHDU DV \RX W\SH

7KHUH LV QR QHHG IRU D YLVLE0H 0DEH0 DV WKH PDJQLI\LQJ J0DVV LFRQ D0VR VKRZV WKH FRQWH[W RI WKH LQSXW ILH0G +RZHYHU DQ DFFHVVLE0H QDPH LV UHTXLUHG IRU VFUHHQ UHDGHU XVHUV

7KH VHDUFK LQSXW ILH0GV DUH WR EH 0DEH0HG PHDQLQJIX00\ ZLWK DQ DULD 0DEH0

FRQWH[W	+HDGHU ! 6HDUFK LQSXW ILH0G %UDQFK ! 6HDUFK LQSXW ILH0G ZLWKLQ WDE0H LQ EXL0G KLVWRU\ 8VHU PHQX ! 6HWWLQJV
FULWHULD	,QIRUPDWLRQ DQG 5H0DWLRQVKLSV
XVHU JURXSV	E0LQG _ PRWRU LPSDLUHG
FDWHJRU\	KXUG0H

5HVX0W ,QSXW ILH0GV IRU XVHU GDWD GR QRW FRQYH\ WKH SXUSRVH

1R 0DQJXDJH LQGHSHQGHQW LQSXW VXSSRUW LV RIIHUHG ZLWKLQ WKH XVHU SURIL0H VHWWLQJV WKDW FRQYH\V WKH SXUSRVH RI WKH LQSXW ILH0GV IRU WKH XVHU QDPH DQG HPDL0 DGGUHVV IRU H[DPS0H WKURXJK DQ DXWRFRPS0HWH DWWULEXWH

,QSXW ILH0GV WKDW UHIHU WR WKH XVHU KLPVH0I VKRX0G HQDE0H D VHPDQWLFD00\ F0HDU 0DQJXDJH LQGHSHQGHQW GHWHUPLQDWLRQ RI WKHLU SXUSRVH 7KH +70/ DXWRFRPS0HWH DWWULEXWH LV FXUUHQW0\ VXLWDE0H IRU WKLV ZLWK ZKLFK WKH LQSXW SXUSRVH IRU ILH0GV VXFK DV QDPH H PDL0 RU WH0HSKRQH QXPEHU DV ZH00 DV IRU DGGUHVV GDWD RU FUHGLW FDUG GDWD FDQ EH GHILQHG ,W LV H[SHFWHG WKDW RWKHU WD[RQRPLHV ZL00 EH GHYH0RSHG WR GHILQH WKH SXUSRVH RI LQWHUIDFH FRPSRQHQWV ZKLFK FDQ UHS0DFH WKH XVH RI DXWRFRPS0HWH

7R VXSSRUW 0DQJXDJH LQGHSHQGHQW RSHUDWLRQ DQ DXWRFRPS0HWH DWWULEXWH VKRX0G EH RIIHUHG LQ WKH XVHU SURIL0H VHWWLQJV IRU WKH XVHU QDPH DQG H PDL0 DGGUHVV ,Q DGGLWLRQ WKH FRUUHVSRQGLQJ LQSXW W\SHV PXVW EH VHW FRUUHFW0\

FRQWH[W   8VHU 3URIL0H ! 6HWWLQJV

FULWHULD   3XUSRVH RI (QWU\

XVHU JURXSV   E0LQG SHRS0H

FDWHJRU\   LPSDLUPHQW

$0WHUQDWLYHV IRU 1RQ 7H[W &RQWHQW

5HVX0W   *UDSKLF HYD0XDWLRQV DUH QRW DFFHVVLE0H

2Q WKH EUDQFK RYHUYLHZ SDJH D 0RW RI LQIRUPDWLRQ LV SUHVHQWHG LQ GLDJUDPV 7KHVH GLDJUDPV DSSDUHQW0\ FRQYH\ LPSRUWDQW LQIRUPDWLRQ WKDW LV RQ0\ SUHSDUHG LQ JUDSKLF IRUP DQG IRU ZKLFK DW 0HDVW LQ WKLV YLHZ QR D0WHUQDWLYHV DUH SURYLGHG

1RWH 7KH GLVS0D\ RI WKH GLDJUDPV PD\ GHSHQG RQ FHUWDLQ VHWWLQJV DV WKHVH DUH RQ0\ GLVS0D\HG IRU WKH VH0HFWHG 8VDEL0LW\ SURMHFW DQG QRW IRU WKH 'HY2SV 6KRZFDVH SURMHFW

7R ZKDW H[WHQW WKH WDE0HV DYDL0DE0H XQGHU WKH PHQX RSWLRQV VRPH RI ZKLFK DUH LGHQWLFD0 RIIHU DGHTXDWH YD0XHV FDQQRW EH DVVHVVHG 7KLV UHTXLUHV D SURIHVVLRQD0 DVVHVVPHQW

)LJXUH   *UDSKLF FRQWHQW ZLWKRXW WH[W D0WHUQDWLYHV 8VDEL0LW\ SURMHFW

,I WKH LPDJHV RU JUDSKLFV RU REMHFWV FRQYH\ LQIRUPDWLRQ WKH\ UHTXLUH WH[W D0WHUQDWLYHV WKDW GHVFULEH WKH FRQWHQW RU SXUSRVH RI WKH LPDJH DQG FDQ EH RXWSXW E\ D VFUHHQ UHDGHU 7KH WH[W D0WHUQDWLYHV UHS0DFH WKH LPDJH VR WKH\ VKRX0G LI SRVVLE0H GR WKH VDPH MRE DV WKH LPDJH

)RU D00 LQIRUPDWLYH JUDSKLFV KHUH GLDJUDPV   FRUUHVSRQGLQJ D0WHUQDWLYHV VKRX0G EH PDGH DYDL0DE0H LQ WKH IRUP RI WDE0HV

CRQWH[W   ' DVKERDUG ! 8VDELOLW\ IROGHU ! 8VDELOLW\ SURMHFW ! MHQLQV GHPR UHSRVLWRU\ ! GRFNHU EUDQFK

CULWHULD   1RQ 7H[W &RQWHQW

XVHU JURXSV   EOLQG SHRSOH

FDWHJRU\   %HVW SUDFWLFH VLQFH WKH DGGRQV DUH QRW LQFOXGHG LQ WKH DQDO\VLV

5HVXOW   ' HFRUDWLYH JUDSKLFV DUH QRW KLGGHQ IRU EOLQG XVHUV

' HFRUDWLYH JUDSKLFV DUH QRW UHFRJQL]HG DV VXFK LQ YDULRXV SODFHV DQG WKH ILOH QDPH LV RXWSXW LQVWHDG RI D PHDQLQJIXO GHVLJQDWLRQ

%HORZ DUH VRPH H[DPSOHV

á   ' HFRUDWLYH JUDSKLFV EHIRUH WKH K ! KHDGLQJ

)LJXUH   ' HFRUDWLYH JUDSKLF EHIRUH WKH K ! KHDGLQJ QRW PDUNHG DV VXFK H[DPSOH UHSRVLWRU\ EXLOG KLVWRU\

á   ' HFRUDWLYH JUDSKLFV EHIRUH WH[W OLQNV

)LJXUH   ' HFRUDWLYH JUDSKLF LQ IURQW RI DJHQW OLQN VGFORXG MHQNLQV QRW PDUNHG DV VXFK H[DPSOH QRGH YLHZ

á   9DULRXV GHFRUDWLYH JUDSKLFV LQ WKH EXLOG YLHZ

á   7KH 0LQNHG XVHU LFRQV LQ WKH ILUVW FR0XPQ RI WKH XVHU WDE0H DUH D00 RXWSXW ZLWK WKH
     VD P H IL0H QD P H 3HUVRQ DQG FDQQRW EH GLVWLQJXLVKHG

$ JUDSKLF WKDW GRHV QRW KDYH DQ LQIRUPDWLYH IXQFWLRQ GRHV QRW QHHG DOW WH[W *UDSKLFV ZLWKRXW DQ LQIRUPDWLYH IXQFWLRQ DUH IRU H[DPS0OH VSDFHUV FRORU DUHDV SDWWHUQV RU SXUHO0\ GHFRUDWLYH SKRWRV

6XFK JUDSKLFV VKRXO0G EH PDUNHG ZLWK DQ HPSW\ DOW DWWULEXWH DOW   RU RQO0\ ZLWK WKH DWWULEXWH QDPH DOW 7KLV QHHGV WR EH FKHFNHG DQG FRUUHFWHG IRU DOO JUDSKLFV WKURXJKRXW WKH DSSOLFDWLRQ

á   ,Q WKH KHDGHU ERWK WKH -HQNLQV 0RJR DQG WKH IRQW JUDSKLF DUH JLYHQ WKH VDPH DOWHUQDWLYH WH[W -HQNLQV   ZKLFK LV GLVSD0\HG WZLFH IRU VFUHHQ UHDGHU XVHUV

1RWH 7KH 0LQN WDUJHW RQ WKH RWKHU KDQG LV QRW VXIILFLHQW0\ UHFRJQL]DE0OH VLQFH WKH 0LQN WR WKH KRPH SDJH LV QRW FRPPXQLFDWHG VHH UHVXOW

' XS0OLFDWH WH[W DOWHUQDWLYHV VKRXO0G EH DYRLGHG ZKLFK LV ZK\ WKH

H[LVWLQJ WZR D0W DWWULEXWHV RQH VKRX0G EH H PSW\ WR DYRLG GXS0LFDWH RXWSXW IRU VFUHHQ
UHDGHU XVHUV

FRQWH[W   *HQHUD0 VHH H[DPS0HV

FULWHULD   1RQ 7H[W &RQWHQW

XVHU JURXSV   E0LQG SHRS0H

FDWHJRU\   LPSDLUPHQW

=RRP DQG)RQW (Q0DUJHPHQW

5HVX0W   7KH FRQWHQW GRHV QRW ZUDS SURSHU0\ DW

: LWK D VHW EURZVHU ZLQGRZ ZLGWK RI   &66 SL[H0V DQG   ]RRP PDJQLILFDWLRQ D00
FRQWHQW FDQ EH UHDG ZLWKRXW DQ\ SURE0HPV 7KHUH LV QR RYHU0DSSLQJ RU FXWWLQJ RII RI
LPSRUWDQW FRQWHQW

2Q0\ LQ WKH GLDJUDPV DUH WKHUH PLQRU FXW RIIV LQ WKH DUHD RI WKH D[LV 0DEH0V

)LJXUH   3RVLWLYH LPSRUWDQW FRQWHQW LV QRW RYHU0DLG DW   PDJQLILFDWLRQ

+RZHYHU WKH PHQX LV QRW IR0GHG LQWR D KDPEXUJHU PHQX DV XVXD0 ZKHQ HQ0DUJHG
DFFRUGLQJ0\ VR WKDW WKH FRQWHQW LV YLVLE0H GLUHFW0\ IURP WKH EHJLQQLQJ RI WKH SDJH EXW WKH
 PHQX WDNHV XS WR WKUHH VFUHHQ SDJHV LQ LWV PD[LPXP VWDWH EHIRUH WKH DFWXD0 FRQWHQW
EHFRPHV YLVLE0H 0LNH WKH IR00RZLQJ 'HPRQVWUDWH L00XVWUDWLRQV

Figure   Menu at   magnification   Part

Figure   Menu at   magnification   part

Filename Jenkins Accessibility Investigation Report.docm   Version

Status Final   Protection Class   Internal

Figure   Menu and build history at   magnification Part

Figure   After three screens finally contentat   magnification

At   magnification text and buttons wrap correctly

)LJXUH   3RVLWLYH FRUUHFW EUHDN DW   PDJQLILFDWLRQ

+RZHYHU WKHUH LV D VLJQLILFDQW 0RVV RI FRQWHQW ZLWKLQ WKH GLDJUDPV GXH WR FXWWLQJ RII LQ WKH DUHD RI WKH 0HJHQG 0DEH0V 7RR0WLSV RQ WKH YHUWLFD0 D[LV ZKLFK VKRZ GHWDL0V RI WKH GLDJUDP YD0XHV ZKHQ \RX PRXVH RYHU WKHP DUH SRVLWLRQHG IDU HQRXJK IL[HG WR WKH 0HIW WKDW WKH\ DUH QR 0RQJHU YLVLE0H DW WKLV PDJQLILFDWLRQ

)LJXUH $W   PDJQLILFDWLRQ WKH YHUWLFD0 0HJHQG LV PLVVLQJ

1RWH (YHQ ZLWKRXW HQ0DUJHPHQW WKHUH DUH VKLIWV LQ WKH UHVSRQVLYH 0D\RXW RQ WKH EUDQFK SDJH ZKLFK PHDQV WKDW WKH RYHUYLHZ WDE0H IRU WKH 6WDJH 9LHZ ZKLFK LV LPSRUWDQW IURP WKH XVHU V SRLQW RI YLHZ RQ0\ EHFRPHV YLVLE0H DIWHU D 0RQJ VFUR00LQJ WLPH 6HH XVDEL0LW\ UHSRUW DGGHQGXP   IRU GHWDL0V

7KH 0D\RXW VKRX0G EH UHYLVHG VR WKDW WKH 6WDJH 9LHZ RYHUYLHZ LV LP PHGLDWH0\ YLVLE0H LQ WKH PDLQ FRQWHQW DUHD RI WKH EUDQFK SDJH $0WHUQDWLYH0\ RWKHU PHFKDQLVPV VKRX0G EH SURYLGHG VR WKDW XVHUV FDQ KLGH WKH GLVS0D\HG GLDJUDPV RQ WKLV SDJH

7KH GLDJUDPV VKRX0G EH LQWHJUDWHG LQ VXFK D ZD\ WKDW WKH\ DUH GLVS0D\HG FRPS0HWH0\ LQF0XGLQJ D00 D[HV DQG WRR0WLSV LQ WKH YLVLE0H DUHD

FRQWH[W	'DVKERDUG !)R0GHU ! 3URMHFW ! 5HSRVLWRU\ ! %UDQFK SDJH
FULWHULD	&KDQJHDE0H WH[W VL]H 5HIRUPDWWLQJ
XVHU JURXSV	YLVXD00\ LPSDLUHG
FDWHJRU\	LPSDLUPHQW

5HVXOW   6RPH FRQWHQW LV QRW HDVLO\ UHFRJQL]DEOH GXH WR SRRU FRQWUDVW

&RQWUDVWV DUH VRPHWLPHV LQVXIILFLHQW VR WKDW LQIRUPDWLRQ LV GLIILFXOW WR UHDG RU UHFRJQL]DEOH 7KH IROORZLQJ H[DPSOHV VWRRG RXW

- á   ,Q WKH EXLOG KLVWRU\ WKH GDWHV DQG WLPHV LQ WKH WLPHOLQH DUH KDUG WR UHDG 7KH FRQWUDVW LV RQO\   RU   LQVWHDG RI WKH QHFHVVDU\ FRQWUDVW RI

)LJXUH   'LIILFXOW WR VHH LQIRUPDWLRQ LQ WKH EXLOG KLVWRU\ WLPHOLQH

- á   ,Q WKH EXLOG VWDWXV WKH VL]HV RI WKH EXLOG DUWLIDFWV DUH GLIILFXOW WR UHDG 7KH FRQWUDVW LV   LQVWHDG RI

)LJXUH   %DG0\ UHFRJQL]DE0H VL]HV RI WKH EXL0G DUWLIDFWV LQ WKH EXL0G VWDWXV

á   : LWKLQ WKH WDE0H LQ WKH 6WDJH 9LHZ WKHUH LV D 0RW RI WH[W FRQWHQW WKDW LV YHU\ GLIILFX0W WR UHDG GXH WR WKH SRRU FRQWUDVW 7KH FRQWUDVW UDQJH IURP   WH[W LQ WKH ILUVW FR0XPQ WKURXJK   IRU D WLPH RI   PV WR   IRU D WLPH RI V ,W VHHPV DV LI WKH FRQWUDVW YD0XHV   LQFUHDVH DV WKH YD0XHV   LQFUHDVH

(YHQ LI WKH UHDVRQLQJ EHKLQG WKLV LV WKDW YHU\ 0RZ YD0XHV   DUH QRW VR UH0HYDQW DQG WKHUHIRUH GR QRW KDYH WR   FDWFK WKH H\H VR PXFK YLVXD00\ LPSDLUHG XVHUV FDQQRW UHFRJQL]H WKH YD0XHV   DQG WKHUHIRUH FDQQRW MXGJH ZKHWKHU LW LV WKHLU YLVXD0 DEL0LWLHV RU WKDW LV LQWHQGHG

)LJXUH   'LIILFX0W WR VHH LQIRUPDWLRQ LQ WKH 6WDJH 9LHZ WDE0H %UDQFK 'RFNHU

á   ,Q WKH FRQVR0H RXWSXWV LPSRUWDQW LQIRUPDWLRQ LV QRW RQ0\ PDUNHG E\ NH\ZRUGV >(55250@ >:$51,1*@ EXW D0VR KLJK0LJKWHG LQ FR0RU

+RZHYHU WKH \H00RZ IRQW FR0RU RQ D ZKLWH EDFNJURXQG LV GLIILFX0W WR UHDG WKH FRQWUDVW LV

á ,QGLYLGXDO IRFXVHG 8, HOHPHQWV LQ WKH EXLOG GHWDLO YLHZ DUH GLIILFXOW WR GLVWLQJXLVK IURP WKH XQIRFXVHG VWDWH

: KLOH VLPSOH WH[W OLQNV DUH SURYLGHG ZLWK DQ HDVLO\ SHUFHSWLEOH EODFN IUDPH PDJHQWD FRORUHG EXWWRQV DUH PDUNHG ZLWK D EOXH IRFXV IUDPH &66 EXWWRQV DUH RQO\ KLJKOLJKWHG ZLWK D JUD\ EDFNJURXQG ERWK RI ZKLFK GR QRW KDYH WKH UHTXLUHG FRQWUDVW RI   EXW RU

)LJXUH   ' LIILFX0W WR VHH GLIIHUHQFH EHWZHHQ IRFXVHG DQG XQIRFXVHG EXWWRQV

3HRS0H ZLWK YLVXD0 LPSDLUPHQWV UH0\ RQ JRRG FRQWUDVWV RI WH[W DQG JUDSKLF FRQWHQW DQG FRQWUR0V WR WKH DGMDFHQW FR0RUV RI   IRU WH[W RU   IRU QRQ WH[W FRQWHQW RU EHWWHU

$00 WH[W FR0RUV DQG DVVRFLDWHG EDFNJURXQG FR0RUV RI WKH DSS0LFDWLRQ VKRX0G EH FKHFNHG ,QVXIILFLHQW FRQWUDVW UDWLRV ZLWK YD0XHV 0HVV WKDQ   PXVW EH FRUUHFWHG

7KH FR0RU RI IRFXV IUDPHV PXVW EH DGMXVWHG VR WKDW WKH GLIIHUHQFH WR QRQ IRFXVHG 8, H0HPHQWV LV DW 0HDVW

,I WKH IRFXV LV DFKLHYHG E\ FKDQJLQJ WKH FR0RUHG EDFNJURXQG WKLV PXVW EH DGMXVWHG VR WKDW WKH GLIIHUHQFH WR WKH EDFNJURXQG ZKHQ QRW LQ IRFXV LV DW 0HDVW

FRQWH[W	,Q JHQHUD0 VHH H[DPS0HV
FULWHULD	&RQWUDVW
	1RQ 7H[W &RQWUDVW
	9LVLE0H)RFXV
XVHU JURXSV	YLVXD00\ LPSDLUHG
FDWHJRU\	KXUG0H

2XWFRPH   *UDSKLFD0 LQIRUPDWLRQ LV FRQYH\HG RQ0\ WKURXJK FR0RU

2Q WKH EUDQFK RYHUYLHZ SDJH D 0RW RI LQIRUPDWLRQ LV SUHVHQWHG LQ GLDJUDPV 7KHVH FKDUWV FRQYH\ WKHLU LQIRUPDWLRQ YLD FR0RUHG 0LQHV WKDW FDQQRW EH GLVWLQJXLVKHG E\ FR0RU E0LQG XVHUV

7KH PHDQLQJ RI WKH FR0RUV LV H[S0DLQHG LQ D FRUUHVSRQGLQJ 0HJHQG

,I LQIRUPDWLRQ LV FRQYH\HG H[F0XVLYH0\ YLD FR0RU WKLV LV RQ0\ DYDL0DE0H WR XVHUV ZKR DUH QRW UHVWULFWHG LQ WKHLU YLVXD0 DEL0LWLHV %0LQG DQG SRVVLE0\ D0VR FR0RU VLJKWHG XVHUV ZKR PD\ ZRUN ZLWK WKHLU RZQ FR0RU VFKHPHV FDQQRW LGHQWLI\ DQG GLVWLQJXLVK EHWZHHQ FR0RUV RU RQ0\ WR D 0LPLWHG H[WHQW &RQWHQW WKDW LV RQ0\ FRQYH\HG YLD FR0RUV PD\ QRW EH SHUFHLYHG E\ E0LQG XVHUV DQG PD\ QRW EH DE0H WR LQWHUDFW ZLWK LW LQ WKH DSS0LFDWLRQ

Note: The display of the diagrams may depend on certain settings as these are only displayed for the selected Usability project and not for the DevOps Showcase project

Figure: Graphic content is conveyed exclusively by color (Usability project)

In addition to the colored lines in the diagrams different line types should be used so that they can be distinguished

context	Dashboard > Usability folder > Usability project > Jenkins demo repository > docker branch
criteria	Color
user groups	visually impaired
category	Best practice since the addons are not included in the analysis

Language

Result: The main language of the application is not specified correctly

The Jenkins application does not have a main language specified in the html > element. The lang attribute is missing

File name: Jenkins_Accessibility_Investigation_Report.docm

Version

Status Final

Protection class

: as sandlg

Internal

$VVLVWLYH WHFKQR0RJLHV DV ZH00 DV WUDGLWLRQD0 XVHU DJHQWV EURZVHUV FDQ GLVS0D\ WH[W DFFXUDWH0\ LI WKH 0DQJXDJH RI WKH ZHEVLWH LV LGHQWLILHG 6FUHHQ UHDGHUV XVH ZRUG 0LVWV WKDW VSHFLI\ WKH SURQXQFLDWLRQ RI ZRUGV <RX QHHG LQIRUPDWLRQ DERXW WKH 0DQJXDJH LQ ZKLFK D WH[W LV ZULWWHQ VR WKDW WKH FRUUHFW ZRUG 0LVW FDQ EH XVHG DQG WKH WH[W FDQ EH SURQRXQFHG FRUUHFW0\

7KH PDLQ 0DQJXDJH LQ WKLV FDVH *HUPDQ PXVW EH VSHFLILHG RQ D00 SDJHV XVLQJ WKH 0DQJ! DWWULEXWH LQ WKH RSHQLQJ +70/ H0HPHQW   KWP00DQJ GH !

COQWH[W   *HQHUD00\

FULWHULD   /DQJXDJH

XVHU JURXSV   E0LQG SHRS0H

FDWHJRU\   LPSDLUPHQW

5HVX0W   0DQ\ (QJ0LVK WHUPV DUH XVHG LQ WKH *HUPDQ LQWHUIDFH

' HVSLWH WKH PDLQ DSS0LFDWLRQ 0DQJXDJH *HUPDQ PDQ\ WHUPV DUH GLVS0D\HG LQ (QJ0LVK ZKLFK PHDQV WKDW E0LQG XVHUV LQ SDUWFX0DU KDYH WKH XJ0\ 0DQJXDJH PL[UHDG RXW E\ WKH VFUHHQ UHDGHU 7KH IR00RZLQJ H[DPS0HV VKRX0G RQ0\ VKRZ WKLV DV DQ H[DPS0H

7KH H[DPS0HV ZHUH WDNHQ IURP WKH FXUUHQW XVDEL0LW\ UHSRUW

)LJXUH 1RW DOO PHQX LWHPV DUH WUDQV0DWHG

)LJXUH 1RW DOO WH[WV RQ WKH EXLOG SDJH DUH WUDQV0DWHG WKH EXWWRQ DOVR KDV DQ (QJOLVK QDPH 'RQ¶W NHHS

)LOH QDPH -HQNLQV\$FFHVVLELOLW\,QYHVWLJDWLRQB5HSRUW GRFP   9HUVLRQ   DV VWDQGLQJ

6WDWXV)LQDO   3URWHFWLRQ FODVV   ,QWHUQDO

)LJXUH   0L[RI *HUPDQ DQG (QJ0LVK ZKHQ FUHDWLQJ D FXVWRP YLHZ

,I (QJ0LVK WHUPV DUH WHFKQLFD0 WHUPV DQG WKHUHIRUH QRW DSSURSULDWH0\ WUDQV0DWDE0H LW LV
RND\ LI WKH\ UHPDLQ XQWUDQV0DWHG +RZHYHU WKLV LV RIWHQ LQIRUPDWLRQ WKDW GRHV QRW
UHSUHVHQW WHFKQLFD0 WHUPV EXW VLPS0\ KDV QRW EHHQ IX00\ WUDQV0DWHG

7KH *HUPDQ LQWHUIDFH VKRX0G EH FRPS0HWH0\ DQG FRQVLVWHQW0\ WUDQV0DWHG LQWR *HUPDQ

EHFRPH

6FUHHQ UHDGHUV XVH WKH VHW 0DQJXDJH WR GHWHUPLQH WKH FRUUHFW SURQXQFLDWLRQ RI D ZRUG : KHQ (QJ0LVK 0DQJXDJH WHUPV DUH SURQRXQFHG 0LNH *HUPDQ WKH\ VRPHWLPHV EHFRPH LQFRPSUHKHQVLE0H

)RU EHWWHU XQGHUVWDQGLQJ WKH 0DQJXDJH FKDQJH FDQ EH PDUNHG ZLWK WKH 0RQJ DWWULEXWH IRU UHPDLQLQJ (QJ0LVK WHUPV

FRQWH[W   * HQHUDO0\ 6HH GHVFULSWLRQ IRU H[DPS0HV

FULWHULD   /DQJXDJH RI ,QGLYLGXD0 6HFWLRQV

XVHU JURXSV   E0LQG SHRS0H

FDWHJRU\   LPSDLUPHQW

$ 3URFHGXUH DQG ERXQGDU\ FRQGLWLRQV

,Q WKLV VHFWLRQ WKH REMHFWLYH PHWKRGRORJ\ DQG RWKHU ERXQGDU\ FRQGLWLRQV RI WKH DFFHVVLELOLW\ VWXG\ DUH H[SODLQHG

$ 2EMHFWLYH

7KH REMHFWLYH RI WKH VWXG\ ZDV HVVHQWLDOO\ WR FKHFN FRPSOLDQFH ZLWK VWDQGDUGL]HG DFFHVVLELOLW\ FULWHULD VHH 6HFWLRQ $ 7KH ILQGLQJV VKRXOG WKHQ EH VXPPDUL]HG DV DQ RYHUDOO UHVXOW RQ DFFHVVLELOLW\ VHH 0DQDJHPHQW 6XPPDU\ ,Q DGGLWLRQ UHFRPPHQGDWLRQV IRU UHVROYLQJ LGHQWLILHG DFFHVVLELOLW\ LVVXHV VKRXOG EH SURYLGHG

7KLV VKRXOG EH GRQH LQ WKH IRUP RI DQ H[SHUW HYDOXDWLRQ)RU WKLV SXUSRVH WKH 3HRSOH 8QLW 8; 8VHU ([SHULHQFH LQ WKH $UFKLWHFWXUH   8; FKDSWHU RI ' HXVFKH 7H0HNRP ,7 ,7 5&B&B&D ZDV FRPPLVVLRQHG WR GHVLJQ WKH V\VWHP RQ WKH EDVLV RI JHQHUDOO\ DSS0LFDEOH DFFHVVLELOLW\ UHTXLUHPHQWV EDVHG RQ >%,79   @ > : &$* @ > : &$* @ DQG >,62   @ VHH 6HFWLRQ $

$ 0HWKRGRORJ\

7KH LQYHVWLJDWLRQ ZDV FDUULHG RXW LQ WKH IRUP RI D FKHFN0LVW EDVHG DQG WRR0 VXSSRUWHG H[SHUW HYDOXDWLRQ 2QH RU PRUH H[SHUWV H[DPLQH WKH V\VWHP LQ WHUPV RI DFFHVVLELOLW\ UHTXLUHPHQWV ZKLFK DUH XVHG DV WHVW FULWHULD DQG IURP WKH XQGHU0LQJ FKHFN0LVW VHH 6HFWLRQ $

,Q DGGLWLRQ D QXPEHU RI WRR0V ZHUH XVHG DV DQ DLG WR 0RRN DW VSHFLILF DVSHFWV LQ PRUH GHWDL0 WKHVH WRR0V DUH 0LVWHG LQ $SSHQGL[%

7KH WHVW VSHFLILFDWLRQV 0DUJH0\ FRUUHVSRQG WR WKH VSHFLILFDWLRQV GRFXPHQWHG DQG YD0LGDWHG LQ >%,79WHVV@ ZKLFK DUH EDVHG RQ >%,79   @ RU > : &$* @ DQG > : &$* @

$FFHVVLELOLW\ LVVXHV LGHQWLILHG GXULQJ WKH FKHFN DUH FDWHJRUL]HG EDVHG RQ WKHLU VHYHULW\ DV D E0RFNDJH KXUG0H RU 0LPLWDWLRQ 7KLV LQF0XGHV ERWK WKH HIIHFW DQG ZKHWKHU WKH SUREOHP FDQ EH DYRLGHG ' HWDL0V FDQ EH IRXQG LQ 6HFWLRQ $

6LQFH LW LV PHWKRGLFD00\ QRW SRVVLE0H WR FKHFN D00 DSS0LFDWLRQ SDUWV LQF0XGLQJ D00 DQFL00DU\ IXQFWLRQV DQG VXE GLD0RJV D IRFXV ZDV PDGH RQ WKH PRVW LPSRUWDQW SDJHV DQG VFHQDULRV DSS0LFDWLRQ FDVHV XVH FDVHV   7KLV IRFXV GHWHU PLQHV WKH VFRSH RI WKH LQYHVWLJDWLRQ DQG FDQ EH IRXQG LQ $SSHQGL[%

$ $FFHVVLELOLW\ &ULWHULD

7KH DFFHVVLELOLW\ FULWHULD DJDLQVW ZKLFK WKH DSS0LFDWLRQ ZDV WHVWHG DUH EDVHG RQ WKH 2UGLQDQFH RQ WKH &UHDWLRQ RI $FFHVVLE0H ,QIRUPDWLRQ 7HFKQR0RJ\ DFFRUGLQJ WR WKH ' LVDELOLW\ (TXD0LW\ $FW $FFHVVLE0H ,QIRUPDWLRQ 7HFKQR0RJ\ 2UGLQDQFH >%,79   @ RU RQ WKH : HE &RQWHQW $FFHVVLELOLW\ * XLGH0LQHV > : &$* @ ZKLFK DUH 0DUJH0\ LGHQWLFD0 LQ FRQWHQW

,Q DGGLWLRQ WKH UHTXLUH PHQWV DQG FULWHULD RI : &$ *   WKDW KDYH EHHQ LQ IRUFH VLQFH -XQH   KDYH EHHQ LQWHJUDWHG > : &$ *   @

7KHVH FULWHULD DUH VWUXFWXUHG DFFRUGLQJ WR WKH IR00RZLQJ   SULQFLS0HV DQG   UHTXLUHPHQWV

3ULQFLS0H   3HUFHSWLELOLW\

7KH LQIRUPDWLRQ DQG FRPSRQHQWV RI WKH XVHU LQWHUIDFH PXVW EH SUHVHQWHG LQ VXFK D ZD\ WKDW WKH\ FDQ EH SHUFHLYHG E\ WKH XVHUV

- á   5HTXLUHPHQW

)RU DQ\ QRQ WH[W FRQWHQW   D0WHUQDWLYHV PXVW EH SURYLGHG LQ WH[W IRUP WKDW FDQ EH DGDSWHG WR XVHUV QHHGV

- á   5HTXLUHPHQW

  $0WHUQDWLYHV DUH WR EH SURYLGHG IRU WLPH WULJJHUHG PHGLD

- á   5HTXLUHPHQW

  &RQWHQW PXVW EH GHVLJQHG LQ VXFK D ZD\ WKDW LW FDQ EH SUHVHQWHG LQ GLIIHUHQW ZD\V ZLWKRXW 0RVLQJ LQIRUPDWLRQ RU VWUXFWXUH

- á   5HTXLUHPHQW

  ,W LV WR EH PDGH DV HDV\ DV SRVVLE0H IRU XVHUV WR SHUFHLYH WKH FRQWHQW DQG GLVWLQJXLVK EHWZHHQ IRUHJURXQG DQG EDFNJURXQG

3ULQFLS0H   XVDEL0LW\

8VHU LQWHUIDFH FRPSRQHQWV DQG QDYLJDWLRQ PXVW EH RSHUDE0H

- á   5HTXLUHPHQW

  $FFHVVLEL0LW\ YLD WKH NH\ERDUG PXVW EH HQVXUHG IRU WKH HQWLUH IXQFWLRQD0LW\

- á   5HTXLUHPHQW

  8VHU PXVW EH JLYHQ VXIILFLHQW WLPH WR UHDG DQG XVH WKH FRQWHQW

- á   5HTXLUHPHQW

  &RQWHQW PXVW EH GHVLJQHG LQ VXFK D ZD\ WKDW QR HSL0HSWLF VHL]XUHV DUH WULJJHUHG

- á   5HTXLUHPHQW

  7KH XVHU LV WR EH SURYLGHG ZLWK RULHQWDWLRQ DQG QDYLJDWLRQ DLGV DV ZH00 DV DLGV IRU ILQGLQJ FRQWHQW

- á   5HTXLUHPHQW

  ,W LV WR EH PDGH HDVLHU IRU WKH XVHU WR RSHUDWH WKH IXQFWLRQD0LW\ E\ SURYLGLQJ YDULRXV LQSXW PHWKRGV EH\RQG WKH NH\ERDUG   )RFXV   PRELOH GHYLFHV

3ULQFLS0H   8QGHUVWDQGDEL0LW\

7KH LQIRUPDWLRQ DQG RSHUDWLRQ RI WKH XVHU LQWHUIDFH PXVW EH XQGHUVWDQGDE0H

- á   5HTXLUHPHQW

    7H[W PXVW EH 0HJLEOH DQG XQGHUVWDQGDEOH

- á   5HTXLUHPHQW

    : HE SDJHV PXVW EH GHVLJQHG LQ VXFK D ZD\ WKDW FRQVWUXFWLRQ DQG XVH DUH IRUHVHHDEOH

- á   5HTXLUHPHQW

    6XSSRUWLQJ IXQFWLRQV IRU WKH LQSXW DUH WR EH SURYLGHG WR DYRLG DQG FRUUHFW HUURUV

3ULQFLSOH   5REXVWQHVV

&RQWHQW PXVW EH UREXVW HQRXJK WR EH UHOLDEO0 LQWHUSUHWHG E\ DV PDQ\ XVHU DJHQWV DV
SRVVLEOH LQF0XGLQJ DVVLVWLYH WHFKQR0RJLHV

- á   5HTXLUHPHQW

    (QVXUH FRPSDWLELOLW\ ZLWK XVHU DJHQWV LQF0XGLQJ DVVLVWLYH WHFKQR0RJLHV

7KH   LQGLYLGXD0 WHVW FULWHULD ьFDQ EH IRXQG LQ $SSHQGL[&

$ &DWHJRUL]DWLRQ RI DFFHVVLELOLW0 LVVXHV

,GHQWLILHG LVVXHV DUH DVVLJQHG WR WKUHH FDWHJRULHV EDVHG RQ WKHLU VHYHULW\ 7KHVH GHSHQG
RQ WKH LPSDFW RI WKH SUREOHP DQG ZKHWKHU LW FDQ EH ZRUNHG DURXQG ,Q DGGLWLRQ WKRVH
UHVSRQVLEOH IRU WKH DSS0LFDWLRQ UHFHLYH LQIRUPDWLRQ DERXW ZKLFK RSWLPL]DWLRQV DUH
SDUWLFXODU0\ UHFRP PHQGHG DQG KDYH WKH JUHDWHV SRVVLEOH SRWHQWLD0 IRU LP SURYLQJ
DFFHVVLELOLW0\ RYHUD00

7KH IR00RZLQJ DSS0LHV KHUH

- á   %0RFNDGH SULRULW\   YHU\ LP SRUWDQW

    3ULRULW\   LVVXHV UHSUHVHQW E0RFNDJHV WKDW DQ DIIHFWHG XVHU FDQQRW E\SDVV 7KLV
     PHDQV WKDW KH FDQQRW UHDFK RU RSHUDWH DQ LP SRUWDQW IXQFWLRQ RU WKDW KH FDQQRW
    SHUFHLYH UH0HYDQW LQIRUPDWLRQ

    6XFK 3ULR   SURE0HP V   E0RFNDJHV PXVW EH UHPHGLHG LP PHGLDWH0\

- á   +XUG0H 3ULRULW\   LP SRUWDQW

    3ULRULW\   SURE0HP V UHSUHVHQW VHULRXV KXUG0HV 7KLV PHDQV WKDW HVVHQWLD0 IXQFWLRQV
    RU LQIRUPDWLRQ FDQ RQ0\ EH XVHG RU SHUFHLYHG ZLWK GLIIFX0\ RU ZLWK VLJQLILFDQW0\
    LQFUHDVHG HIIRUW H J WR FLUFXPYHQW D E0RFNDGH

    6XFK 3ULR   SURE0HP V   KXUG0HV VKRX0G D0VR EH UHPHGLHG DV TXLFN0\ DV SRVVLE0H

- á   ,P SDLUPHQW 3ULRULW\   0HVV LP SRUWDQW

2U *8, PDVNV

Priority problems represent impairments. This means that the affected users are irritated or disturbed or they have to take on a small amount of additional work e g making a special setting or similar

Such Prio problems impairments should also be eliminated but the elimination is less urgent and can e g B in the course of further release planning

In Appendix E a decision graph illustrates the classification

A D Determination of the overall accessibility score

The overall result for accessibility results from the number and category see Section A of the identified accessibility problems The following results can be achieved

- Very good barrier freedom accessibility

  Accessibility is not restricted in any way No problems neither impairments nor hurdles nor blockages are identified

- Good handicap accessibility

  Accessibility is only slightly impaired There are only up to a maximum of three impairments Obstacles or blockages were not determined

- Limited accessibility accessibility

  Accessibility is limited if the application has up to three hurdles Even if she has more than three impairments she still has limited access But there is no blockage

- Severely restricted accessibility accessibility

  If there are more than three hurdles only very limited accessibility can be certified The number of impairments is irrelevant But there shouldn t be a blockage

- Poor accessibility accessibility

  A blockage leads to classification as an application that is difficult to access Of course this also applies if there are several blockages The number of hurdles and impairments no longer plays a role

The following table breaks down the calculation from the identified problems The columns under the problem categories contain the respective number A dash means the count at that point is irrelevant

5HVX0W   SULRULW\   3ULRULW\   3ULRULW\

$FFHVVLELOLW\ LV   E0RFNDGH   KXUG0H   LPSDLUPHQW

9HU\ JRRG

* RRG

5HVWULFWHG   !

+LJK0\ 0LPLWHG   !

%DG   !

7DE0H   &D0FX0DWLRQ RI WKH RYHUD00 DFFHVVLELOLW\ VFRUH IURP WKH QXPEHU DQG FDWHJRU\ RI SUREOHPV LGHQWLILHG

7KH VDPH PHWULF LV XVHG WR GLIIHUHQWLDWH EHWZHHQ WKH LQGLYLGXD0 XVHU JURXSV RU UHVWULFWLRQV EXW RQ0\ WKH SUREOHPV WKDW DIIHFW WKH UHVSHFWLYH XVHU JURXS DUH FRQVLGHUHG

% WHVW LWHP DQG WHVW WRR0V

7KH IR00RZLQJ RYHUYLHZ GHVFULEHV WKH H[DPLQHG DSS0LFDWLRQ DV ZH00 DV WKH DFFHVV DQG H[DPLQDWLRQ PRGD0LWLHV LQ WKH LQVSHFWHG FRQILJXUDWLRQ LQ GHWDL0 $SS0LFDWLRQ DQG V\VWHP HQYLURQPHQW WKH FRUUHVSRQGLQJ DFFHVVHV DQG D00 LQIRUPDWLRQ DERXW WKH V\VWHP ZHUH SURYLGHG E\ WKH FXVWRPHU RU WHFKQLFD0 FRQWDFW SHUVRQ RI WKH VWXG\ E\ HQWHU FRPSDQ\ RU FRQWDFW SHUVRQ!

7KH VWDWHPHQWV DQG ILQGLQJV LQ WKH UHVX0WV VHFWLRQ LQ VHFWLRQ DQG LQ WKH PDQDJHPHQW VXPPDU\ RQ0\ UH0DWH WR SUHFLVH0\ WKLV FRQILJXUDWLRQ

% $SS0LFDWLRQ DQG 6\VWHP (QYLURQPHQW

6\VWHP HQYLURQPHQW

$SS0LFDWLRQ	-HQNLQV
YHUVLRQ UH0HDVH	
$FFHVV	KWWSV PDQRQL GHYRSV W V\VWHPV VHUYLFH FRP MHQNLQV
$FFHVVLEL0LW\ 6HWWLQJV	<HV FR0RU E0LQG VXSSRUW

%) WHVW HQYLURQPHQW

RSHUDWLQJ V\VWHP	: LQGRZV (QWHUSULVH
EURZVHUV	*RRJ0H &KURPH
PRQLWRU	[

7DE0H ([DPLQHG DSS0LFDWLRQ DQG V\VWHP HQYLURQPHQW

% 3DJH 6H0HFWLRQ 6FHQDULRV

$ QXPEHU RI UHSUHVHQWDWLYH SDJHV DQG RU VFHQDULRV ZHUH LGHQWLILHG IRU WKH H[SHUWV WR XVH DV D EDVLV IRU WHVWLQJ WKH DSS0LFDWLRQ 7KH SDJHV RU VFHQDULRV ZHUH FKRVHQ LQ VXFK D ZD\ WKDW WKH\ GHSLFW WKH PDLQ XVH FDVHV WKDW DUH KDQG0HG ZLWK WKH KH0S RI WKH V\VWHP

7KH IR00RZLQJ 0LVW JLYHV DQ RYHUYLHZ RI WKH FRQVLGHUHG VFHQDULRV

- á &KHFNLQJ D SURMHFW EUDQFKHV EXL0GV HUURUV LQ WKH 0DVW EXL0G
- á &UHDWH DQG FKHFN D QHZ EXL0G
- á &KHFN LQGLYLGXD0 EXL0G SKDVHV
- á &KHFN DQG FKDQJH XVHU VHWWLQJV

7KH IR00RZLQJ DUHDV ZHUH QRW FRQVLGHUHG LQ GHWDL0

- á &RQILJXUH
- á P\ YLHZV
- á WKH YDULRXV S0XJLQV

á   E0XH RFHDQ

% $XGLW 7RR0V

7KH IR00RZLQJ WRR0V ZHUH XVHG GXULQJ WKH LQYHVWLJDWLRQ &KHFN WKH YHUVLRQV DQG XSGDWH WKH 0LVW LI QHFHVVDU\ RU D0VR GH0HWH WRR0V WKDW ZHUH QRW XVHG

QDPH PDQXIDFWXUHU	YHUVLRQ	3XUSRVH
0LFURVRIW 2IILFH : RUG		UHSRUWLQJ
0LFURVRIW 2IILFH ([FH0		&UHDWLRQ RI WKH FKHFN0LVW
JUHHQ VKRW	EXL0G	&UHDWLRQ RI VFUHHQVKRWV
&R0RU &RQWUDVW $QD0\]HU 7KH 3DFLH00R *URXS		([PLQDWLRQ RI FR0RU FRQWUDVWV
-$:6)UHHGRP 6FLHQWLILF		VFUHHQ UHDGHU
$1', VHUY0HW		9DULRXV H[PV
: HE GHYH0RSHU WRR0EDU &KULV 3HGHULFN		9DULRXV H[PV
$FFHVVLEL0LW\ ,QVLJKWV IRU : HE		$FFHVVLEL0LW\ WHVWLQJ WRR0

7DE0H 7RR0V XVHG

& $FFHVVLELOLW\ FULWHULD LQ GHWDLO

7KH DFFHVVLELOLW\ FULWHULD DFFRUGLQJ WR >%,79 @ > : &$*   @ > : &$*   @ DUH OLVWHG LQ GHWDLO EHORZ 7KH OLVWHG UHTXLUH PHQWV FRUUHVSRQG WR WKH : &$*   FULWHULD RI OHYHO0V $ DQG $$ 7KH VWDWHPHQW IRU ZKLFK XVHU JURXSV UHVWULFWLRQV D FULWHULRQ LV UH0HYDQW LV 0DUJH0\ EDVHG RQ > : &$* 8QGHUV@

DQQRWDWLRQ

,Q WKH FRQH[W RI : &$*   WKH WHUP HVVHQWLDO ZKLFK LV UHSHDWHG0\ PHQWLRQHG LQ WKH FULWHULD PHDQV WKDW WKH GHVFULEHG IXQFWLRQ SURSHUW\ RU PRGH RI IXQFWLRQLQJ LV DEVR0XWH0\ QHFHVVDU\ DQG FDQQRW EH DFKLHYHG LQ DQ HTXLYD0HQW ZD\ LQ DQ\ RWKHU ZD\

1R	$FFHVVLELOLW\ FULWHULD	XVHU
	1RQ 7H[W &RQWHQW	EOLQG SHRSOH
	)RU DQ\ QRQ WH[W FRQWHQW SUHVHQWHG WR WKH XVHU D WH[W D0WHUQDWLYH PXVW EH SURYLGHG WKDW IX0I00V WKH SXUSRVH RI WKDW FRQWHQW	KHDULQJ VKD UHQGHUHU

7H[W D0WHUQDWLYHV GR QRW QHHG WR EH SURYLGHG LQ WKH IR00RZLQJ FDVHV

,W LV D FRQWUR0 H0HPHQW RU DQ H0HPHQW WKDW DFFHSWV LQSXW IURP WKH XVHU DQG KDV DQ LGHQWLILHU WKDW GHVFULEHV LWV SXUSRVH

7KH\ DUH WLPHG PHGLD DQG WH[W D0WHUQDWLYHV WKDW D0UHDG\ FRQWDLQ DW 0HDVW RQH GHVFULSWLYH H[S0DQDWLRQ RI WKH QRQ WH[W FRQWHQW

7KH\ DUH WHVWV RU H[HUFLVHV WKDW PXVW EH SUHVHQWHG LQ QRQ WH[W IRUPDW DQG WH[W D0WHUQDWLYHV WKDW D0UHDG\ FRQWDLQ DW 0HDVW RQH GHVFULSWLYH H[S0DQDWLRQ RI WKH QRQ WH[W FRQWHQW DUH DYDL0DE0H

6SHFLILF VHQVRU\ H[SHULHQFHV DUH LQWHQGHG WR EH HIIHFWHG DQG WH[W D0WHUQDWLYHV WKDW D0UHDG\ LQF0XGH DW 0HDVW D GHVFULSWLYH H[S0DQDWLRQ RI WKH QRQ WH[W FRQWHQW DUH DYDL0DE0H

,W VKRX0G EH DFKLHYHG WKDW D SHUVRQ QRW D FRPSXWHU DFFHVVHV WKH FRQWHQW DQG WKH QRQ WH[W FRQWHQW LV H[S0DLQHG DQG GHVFULEHG E\ WH[W D0WHUQDWLYHV DQG D0WHUQDWLYH &$37&+$V ZLWK GLIIHUHQW RXWSXW PRGHV IRU GLIIHUHQW W\SHV RI VHQVRU\ SHUFHSWLRQ DUH SURYLGHG

7KH\ DUH SXUH0\ GHFRUDWLYH H0HPHQW RU H0HPHQWV WKDW DUH RQ0\ XVHG IRU YLVXD0 GHVLJQ RU WKH QRQ WH[W FRQWHQW LV QRW YLVLE0H WR WKH XVHU DQG WKHVH H0HPHQWV DUH VHW XS LQ VXFK D ZD\ WKDW WKH\ FDQ EH LJQRUHG E\ DVVLVWLYH WHFKQR0RJLHV

1R $FFHVVLELOLW\ FULWHULD   XVHU

5HFRUGHG $XGLR DQG 9LGHR)LOHV   EOLQG SHRSOH

)RU UHFRUGHG DXGLR RQO\ DQG YLGHR RQO\ ILOHV WKDW DUH QRW   YLVLRQ
WKHPVH0YHV DOUHDG\ D PHGLD DOWHUQDWLYH IRU WH[W DQG DUH FOHDU0\   SUHYHQWHG
LGHQWLILHG DV VXFK WKH IR00RZLQJ PXVW EH SURYLGHG   KHDULQJ
                                                                     VKD

                                                                     UHQGHUHG

)RU WKH FRQWHQW RI WKH UHFRUGHG DXGLR IL0HV WH[W D0WHUQDWLYHV ZLWK
HTXLYD0HQW LQIRUPDWLRQ

)RU WKH FRQWHQW RI WKH UHFRUGHG YLGHR IL0HV WH[W D0WHUQDWLYHV RU
DQ DXGLR WUDFN ZLWK HTXLYD0HQW LQIRUPDWLRQ

([WHQGHG 6XEWLW0HV &DSWLRQV   KHDULQJ

([WHQGHG VXEWLW0HV FDSWLRQV PXVW EH SURYLGHG IRU UHFRUGHG DXGLR   VKD
FRQWHQW RI V\QFKURQL]HG PHGLD 7KLV GRHV QRW DSS0\ WR PHGLD   UHQGHUHG
D0WHUQDWLYHV IRU WH[W ZKLFK DUH F0HDU0\ PDUNHG DV VXFK

$XGLR 'HVFULSWLRQ RU)X00 7H[W $0WHUQDWLYH   EOLQG SHRSOH

)RU SUH UHFRUGHG V\QFKURQL]HG PHGLD D IX00 WH[W D0WHUQDWLYH   YLVLRQ
LQF0XGLQJ D00 LQWHUDFWLRQV RU DQ DXGLR GHVFULSWLRQ VKD00 EH SURYLGHG SUHYHQWHG
7KLV GRHV QRW DSS0\ WR PHGLD D0WHUQDWLYHV IRU WH[W ZKLFK DUH F0HDU0\
PDUNHG DV VXFK

/LYH 6XEWLW0HV   KHDULQJ

,Q WKH FDVH RI 0LYH WUDQVPLVVLRQV RI V\QFKURQL]HG PHGLD D00 DXGLR   VKD
FRQWHQW PXVW EH SURYLGHG DV H[WHQGHG VXEWLW0HV FDSWLRQV   UHQGHUHG

$XGLR 'HVFULSWLRQ   EOLQG SHRSOH

$XGLR GHVFULSWLRQ VKD00 EH SURYLGHG IRU D00 SUH UHFRUGHG YLGHR   YLVLRQ
FRQWHQW RI V\QFKURQL]HG PHGLD 7KLV GRHV QRW DSS0\ WR PHGLD   SUHYHQWHG
D0WHUQDWLYHV IRU WH[W ZKLFK DUH F0HDU0\ PDUNHG DV VXFK

,QIRUPDWLRQ DQG 5H0DWLRQVKLSV   EOLQG SHRSOH

$00 RI WKH LQIRUPDWLRQ VWUXFWXUH DQG UH0DWLRQVKLSV FRQYH\HG   KHDULQJ
WKURXJK 0D\RXW DQG SUHVHQWDWLRQ DUH SURJUDP PDWLFD00\   VKD
UHFRJQL]DE0H RU DYDL0DE0H LQ WKH WH[W   UHQGHUHG

0HDQLQJIX0 RUGHU   EOLQG SHRSOH

: KHQ WKH RUGHU LQ ZKLFK WKH FRQWHQW LV SUHVHQWHG DIIHFWV LWV
PHDQLQJ WKH FRUUHFW UHDGLQJ RUGHU LV GHWHFWDE0H E\ SURJUDPV

6HQVRU\ FKDUDFWHULVWLFV   EOLQG SHRSOH

,QVWUXFWLRQV IRU XQGHUVWDQGLQJ DQG XVLQJ WKH FRQWHQW GR QRW UH0\   YLVLRQ
VR0H0\ RQ VHQVRU\ FKDUDFWHULVWLFV RI WKH LWHPV VXFK DV % VKDSH   SUHYHQWHG
VL]H YLVXD0 S0DFHPHQW RULHQWDWLRQ RU VRXQG   KHDULQJ
                                                                     VKD

                                                                     UHQGHUHG

2ULHQWDWLRQ   YLVLRQ

: &$*   7KH FRQWHQW GRHV QRW 0LPLW HLWKHU YLHZ RU RSHUDWLRQ WR D VLQJ0H SUHYHQWHG
,QGLYLGXD0 RULHQWDWLRQ RI WKH VFUHHQ VXFK DV SRUWUDLW SRUWUDLW PRGH PRWR
RU 0DQGVFDSH 0DQGVFDSH PRGH XQ0HVV VSHFLILHG   IUHVK

1R $FFHVVLELOLW\ FULWHULD   XVHU

$OLJQPHQW LV HVVHQWLDO   FRQV
                                                                   GLHG

3XUSRVH RI (QWU\   YLVLRQ

: &$*   7KH SXUSRVH RI HDFK LQSXW ILHOG ZKLFK LV LQWHQGHG WR SURYLGH LQIRUPDWLRQ   SUHYHQWHG
FROOHFW DERXW WKH XVHU FDQ EH GHWHUPLQHG SURJUDPPDWLFDOO\ ZKHQ   FRJQLWLYH
                                                                                            FRQV

WKH LQSXW ILHOG VHUYHV D SXUSRVH OLVWHG XQGHU ,QSXW 3XUSRVHV IRU 8,   GLHG
&RPSRQHQWV H J WLWOH VDOXWDWLRQ VXUQDPH ILUVW QDPH MRE WLWOH   PRWR
VXUQDPH RUJDQL]DWLRQ SDVVZRUG DQG   ULF

WKH FRQWHQW LV LPSOHPHQWHG XVLQJ WHFKQRORJLHV WKDW VXSSRUW   SUHYHQWHG
GHWHUPLQLQJ WKH H[SHFWHG PHDQLQJ IRU IRUP LQSXW GDWD

&RORU   EOLQG SHRSOH
&RORU VKDOO QRW EH XVHG DV WKH VROH PHDQV RI FRQYH\LQJ   YLVLRQ
LQIRUPDWLRQ LQGLFDWLQJ DQ DFWLRQ HOLFLWLQJ D UHVSRQVH RU   SUHYHQWHG
LGHQWLI\LQJ D YLVXDO HOHPHQW

$XGLR &RQWURO   EOLQG SHRSOH
7KHUH DUH VRXQG HOHPHQWV WKDW DUH DXWR PDWLFDOO\ SOD\HG IRU   KHDULQJ
PRUH WKDQ WKUHH VHFRQGV RQ D ZHE SDJH   VKD
HLWKHU D PHFKDQLVP IRU SDXVLQJ RU HQGLQJ WKH VRXQG RU   UHQGHUHG

$ PHFKDQLVP WR FRQWURO WKH YROXPH LQGHSHQGHQWO\ RI WKH V\VWHP
YROXPH

&RQWUDVW   YLVLRQ
,Q WKH YLVXDO SUHVHQWDWLRQ RI WH[W DQG W\SH JUDSKLFV WKH FRQWUDVW   SUHYHQWHG
UDWLR EHWZHHQ IRUHJURXQG DQG EDFNJURXQG FRORU LV DW OHDVW $
FRQWUDVW UDWLR RI DW OHDVW   DSSOLHV WR ODUJH OHWWHUV DQG OHWWHULQJ
JUDSKLFV ZLWK ODUJH OHWWHUV 1R PLQLPXP FRQWUDVW LV UHTXLUHG IRU
LQFLGHQWDO WH[W DQG W\SH JUDSKLFV
ZKLFK DUH SDUW RI DQ LQDFWLYH FRPSRQHQW RI WKH XVHU LQWHUIDFH
ZKLFK DUH SXUHO\ GHFRUDWLYH
ZKLFK LV LQFLGHQWDO WH[W LQ DQ LPDJH RU

ZKLFK DUH QRW YLVLEOH WR WKH XVHU
7H[W IRUPLQJ SDUW RI D ORJR RU EUDQG QDPH DOVR GRHV QRW KDYH
PLQLPXP FRQWUDVW UHTXLUHPHQWV

&KDQJHDEOH WH[W VL]H   YLVLRQ
7H[W FDQ EH HQODUJHG XS WR   ZLWKRXW DVVLVWLYH WHFKQRORJ\   SUHYHQWHG
ZLWKRXW ORVV RI FRQWHQW RU IXQFWLRQDOLW\

)RQW *UDSKLFV   YLVLRQ
1R WH[W JUDSKLFV DUH WR EH XVHG WR FRQYH\ LQIRUPDWLRQ XQOHVV   SUHYHQWHG

1 R $FFHVVLELOLW\ FULWHULD   XVHU

   7KHVH FDQ EH LQGLYLGXDOO\ DGDSWHG WR WKH YLVXD0 QHHGV RI WKH XVHU RU

   D VSHFLILF SUHVHQWDWLRQ LV HVVHQWLD0 IRU FRQYH\LQJ WKH LQIRUPDWLRQ RI WKH WH[W

5HIRUPDWWLQJ   YLVLRQ

: &$*   &RQWHQW PD\ EH PRGLILHG ZLWKRXW 0RVV RI LQIRUPDWLRQ RU IXQFWLRQD0LW\   SUHYHQWHG
EH VHQW DQG ZLWKRXW KDYLQJ WR VFUR00 LQ WZR GLUHFWLRQV IRU

FRQWHQW WR EH VFUR00HG YHUWLFD00\ XS WR D ZLGWK HTXLYD0HQW WR
&66 SL[H0V

&RQWHQW WR EH VFUR00HG KRUL]RQWD00\ XS WR D KHLJKW HTXLYD0HQW WR
   &66 SL[H0V

([FHSWLRQV DUH SLHFHV RI FRQWHQW WKDW UHTXLUH D WZR GLPHQVLRQD0
0D\RXW IRU XVH RU PHDQLQJ

1RQ 7H[W &RQWUDVW   YLVLRQ

: &$*   7KH YLVXD0 UHSUHVHQWDWLRQ RI WKH IR00RZLQJ LWHPV KDV D FRQWUDVW   SUHYHQWHG
UDWLR RI DW 0HDVW   WR DGMDFHQW FR0RUV RQ

8, &RPSRQHQWV 9LVXD0 LQIRUPDWLRQ UHTXLUHG WR UHFRJQL]H LQWHUIDFH
FRPSRQHQWV DQG VWDWHV H[FHSW IRU LQDFWLYH FRPSRQHQWV RU ZKHQ
WKH FRPSRQHQW V DSSHDUDQFH LV GHWHUPLQHG E\ XVHU DJHQWV DQG
FDQQRW EH FKDQJHG E\ WKH DXWKRU

*UDSKLF RE[HFWV SDUWV RI WKH JUDSKLFV WKDW DUH QHFHVVDU\ WR
XQGHUVWDQG DQG WKH FRQWHQW XQ0HVV D VSHFLILF UHSUHVHQWDWLRQ RI WKH
JUDSKLF LV HVVHQWLD0 WR WKH LQIRUPDWLRQ FRQYH\HG

7H[W VSDFLQJ   YLVLRQ

: &$*   ,Q FRQWHQW LPS0HPHQWHG ZLWK PDUNXS 0DQJXDJHV WKDW FRQWDLQ WKH IR0   SUHYHQWHG
VXSSRUWLQJ WH[W SURSHUWLHV QHLWKHU FRQWHQW QRU IXQFWLRQD0LW\ ZL00
EH 0RVW LI \RX PDNH WKH IR00RZLQJ VHWWLQJV ZLWKRXW FKDQJLQJ DQ\
RWKHU SURSHUWLHV
/LQH KHLJKW DW 0HDV   WLPHV WKH IRQW VL]H
6SDFH EHWZHHQ SDUDJUDSKV DW 0HDV WZLFH WKH IRQW VL]H
6SDFH EHWZHHQ 0HWWHUV DW 0HDV   RI WKH IRQW VL]H

6SDFH EHWZHHQ WZR ZRUGV DW 0HDV   RI WKH IRQW VL]H ([FHSWLRQ
/DQJXDJHV DQG VFULSWV WKDW GR QRW VXSSRUW RQH RU PRUH RI WKHVH
SURSHUWLHV LQ WKH ZULWWHQ WH[W FDQ RQ0\ FRQIRUP WR WKH SURSHUWLHV
WKDW H[LVW IRU WKDW 0DQJXDJH VFULSW FRPELQDWLRQ

&RQWHQW RQ PRXVH RYHU KRYHU DQG IRFXV >H J % 7RR0WLSV VXEPHQXV   YLVLRQ

: &$*   QRQ PRGD0 SRS XSV@   SUHYHQWHG
,I DGGLWLRQD0 FRQWHQW DSSHDUV E\ PRYLQJ WKH PRXVH RYHU DQ   PRWR
H0HPHQW PRXVH RYHU   KRYHU   RU WKH H0HPHQW UHFHLYHV NH\ERDUG   ULF
IRFXV WKHQ WKH IR00RZLQJ LV JXDUDQWHHG   SUHYHQWHG

Hideable A mechanism to hide close content is available without having to move mouse cursor or keyboard focus unless the additional content reports an input error or does not cover or replace other content

Hoverable if the additional content can be displayed by mouse over the mouse pointer can be moved over the additional content without the content disappearing

Persistent The additional content remains visible until the mouse cursor or keyboard focus is removed the user hides il close the content or the information is no longer valid

Exception The visual representation of the additional content is controlled by the user agent and has not been changed by the author

Keyboard Usability

Blind people / vision / prevented / moto / ric / prevented

All of the contents functionality must be accessible through a keyboard interface without having to adhere to specific keystroke timings This is not true when the underlying function requires input that depends not only on the endpoints but also on the history of the user s movement

No Keyboard Trap

Blind people / vision / prevented / moto / ric / prevented

If keyboard focus can be moved to an element of the page using a keyboard interface focus must also be able to be moved away from that element using the keyboard interface If this requires more than the standard arrow or tab keys the user must be informed of the method used to move the focus away

One character shortcut

moto / ric / prevented / user / from / language / yours

WCAG If a keyboard shortcut is in the form of just one character letter upper lower case letter number symbol character or punctuation mark is implemented at least one of the following options is guaranteed

Disable A mechanism is available to disable the hotkey

Remap A mechanism is available to map the hotkey to one or more non printable characters keys e g ctrl alt etc

Active only when in focus The hotkey for a UI component is only active when that component has focus

Time Related Requirements

Blind people / vision / prevented

For any time limit imposed by content at least one of the following must be true

The time limit must be able to be switched off before the time runs out

The time limit can be within a time frame that

moto / ric / prevented / fresh

LV DW 0HDVW WHQ WLPHV WKH GHIDX0W VHWWLQJ   FRQV
GLHG

7KH XVHU LV ZDUQHG WKDW WLPH LV UXQQLQJ RXW DQG WKHQ KDV DW 0HDVW   KHDULQJ
VHFRQGV WR H[WHQG WKH GXUDWLRQ ZLWK D VLPS0H DFWLRQ H J   VKD
SUHVVLQJ WKH VSDFHEDU 7KH XVHU LV JLYHQ WKLV RSSRUWXQLW\ DW 0HDVW   UHQGHUHG
WHQ WLPHV

7KHUH LV QR QHHG WR DGMXVW WKH WLPH 0LPLW LI
WKH WLPH 0LPLW LV D QHFHVVDU\ SDUW RI D UHD0 WLPH HYHQW H J DQ
DXFWLRQ DQG WKHUH LV QR D0WHUQDWLYH WR WKH LQWHQGHG WLPH 0LPLW

WKH WLPH 0LPLW LV QHFHVVDU\ DQG H[WHQGLQJ WKH DFWLYLW\ ZRX0G UHQGHU
LW LQYD0LG RU
WKH WLPH IUDPH LV PRUH WKDQ KRXUV

6WRS H[LW KLGH   YLVLRQ   SUHYHQWHG
,QIRUPDWLRQ WKDW PRYHV E0LQNV RU VFUR00V DQG WKH
LQVHUW DXWR PDWLFD00\
0DVV 0RQJHU WKDQ ILYH VHFRQGV DQG
EH SUHVHQWHG VLPX0WDQHRXV0\ ZLWK RWKHU FRQWHQW
PXVW EH FDSDE0H RI EHLQJ SDXVHG VWRSSHG RU KLGGHQ XQ0HVV WKDW
PRYHPHQW LV HVVHQWLD0 WR DQ DFWLYLW\ ,QIRUPDWLRQ WKDW XSGDWHV
DXWR PDWLFD00\ DQG WKH
GHS0R\ DXWR PDWLFD00\ DQG
EH SUHVHQWHG VLPX0WDQHRXV0\ ZLWK RWKHU FRQWHQW
PXVW EH DE0H WR EH SDXVHG VWRSSHG KLGGHQ RU FRQWUR00HG LQ WKH
UDWH DW ZKLFK WKH\ DUH XSGDWHG XQ0HVV VXFK DXWRPDWLF XSGDWLQJ LV
HVVHQWLD0 WR DQ DFWLYLW\

7KUHH)0DVKHV %H0RZ 7KUHVKR0GV :HE SDJHV ZL00 QRW FRQWDLQ H0HPHQWV   3KRWR
WKDW I0DVK PRUH WKDQ WKUHH WLPHV LQ D RQH VHFRQG SHULRG XQ0HVV WKH   VHQVLWLYH
I0DVK LV EH0RZ WKH JHQHUD0 I0DVK RU UHG I0DVK WKUHVKR0G

%\SDVVLQJ (0HPHQW *URXSV   E0LQG SHRS0H
0HFKDQLVPV DUH DYDL0DE0H WR E\SDVV JURXSV RI H0HPHQWV WKDW DUH   YLVLRQ
UHSHDWHG RQ PX0WLS0H ZHE SDJHV   SUHYHQWHG
PRWR
ULF
SUHYHQWHG

:HEVLWH 7LW0H   E0LQG SHRS0H
:HE SDJHV FRQWDLQ WLW0HV WKDW GHVFULEH WKH WRSLF RU SXUSRVH RI WKH   YLVLRQ
SDJH   SUHYHQWHG
PRWR
ULF
SUHYHQWHG

)RFXV 2UGHU   E0LQG SHRS0H

: KHQ WKH QDYLJDWLRQ VHTXHQFH DIIHFWV WKH PHDQLQJ RU RSHUDELOLW\
RI WKH ZHE SDJH IRFXVDEOH FRPSRQHQWV UHFHLYH IRFXV LQ DQ RUGHU
WKDW HQVXUHV WKDW PHDQLQJ DQG RSHUDELOLW\ DUH SUHVHUYHG

YLVLRQ
SUHYHQWHG
PRWR
ULF
SUHYHQWHG

3XUSRVH RI D 0LQN LQ FRQWH[W

7KH DLP DQG SXUSRVH RI D 0LQN FDQ EH VHHQ IURP WKH 0LQN WH[W LWVH0I
RU IURP WKH 0LQN WH[W LQ FRQQHFWLRQ ZLWK WKH 0LQN FRQWH[W GHWHUPLQHG
E\ SURJUDPV

E0LQG SHRS0H
YLVLRQ
SUHYHQWHG
PRWR
ULF
SUHYHQWHG

$0WHUQDWLYH $FFHVV 5RXWHV

$0WHUQDWLYH ZD\V DUH RIIHUHG WR ILQG FRQWHQW DQG ZHEVLWHV ZLWKLQ
FRQQHFWHG ZHEVLWHV 7KLV GRHV QRW DSS0\ WR SDJHV WKDW FDQ RQ0\ EH
UHDFKHG YLD D VSHFLILF SURFHGXUH

$00 JURRYH
FUXVK

' HVFULSWLRQV

+HDGLQJV DQG 0DEH0V LQGLFDWH WKH WRSLF RU SXUSRVH

E0LQG SHRS0H
YLVLRQ
SUHYHQWHG
PRWR
ULF
SUHYHQWHG

9LVLE0H)RFXV

$ NH\ERDUG IRFXV LV D0ZD\V YLVLE0H GXULQJ NH\ERDUG RSHUDWLRQ

PRWR
ULF
SUHYHQWHG

3RLQWLQJ *HVWXUHV

: &$* $00 IXQFWLRQD0LWLHV WKDW XVH PX0WL WRXFK RU SDWK EDVHG JHVWXUHV
]HQ FDQ D0VR EH FRQWUR00HG ZLWK D VLQJ0H SRLQWHU ZLWKRXW SDWK EDVHG
JHVWXUHV XQ0HVV D PX0WL WRXFK RU SDWK EDVHG JHVWXUH LV HVVHQWLD0

PRWR
ULF
SUHYHQWHG
FRJQLWLYH
FRQV
GLHG

&DQFH0LQJ 3RLQWLQJ *HVWXUHV

: &$*   )RU IXQFWLRQD0LW\ DVVRFLDWHG ZLWK D VLQJ0H SRLQWHU
FDQ EH VHUYHG DW 0HDVW RQH RI WKH IR00RZLQJ RSWLRQV LV JXDUDQWHHG

1R WULJJHULQJ RQ SUHVV WRXFK GRZQ HYHQW 6LPS0\ SUHVVLQJ
WRXFKLQJ GRHV QRW UHVX0W LQ DQ\ SDUW RI WKH IXQFWLRQ D0UHDG\ EHLQJ
WULJJHUHG
$ERUW RU 8QGR 7KH IXQFWLRQ LV H[HFXWHG ZKHQ WKH SRLQWHU LV
UH0HDVHG 8S HYHQW DQG D PHFKDQLVP LV DYDL0DE0H WR DERUW WKH
IXQFWLRQ EHIRUH H[HFXWLRQ RU WR XQGR WKH IXQFWLRQ DIWHU H[HFXWLRQ

$QQX0PHQW RQ UH0HDVH 8S (YHQW 7KH UH0HDVH 8S (YHQW

$00 JURRYH
FUXVK

1 R	$FFHVVLEL0LW\ FULWHULD	XVHU

FDQFH0V WKH HIIHFW RI WKH SUHYLRXV SUHVV WRXFK GRZQ HYHQW

(VVHQWLD0 7KH H[HFXWLRQ RI WKH IXQFWLRQ RQ SUHVVLQJ WRXFKLQJ
GRZQ HYHQW LV HVVHQWLD0

/DEH0 LQ WKH QDPH E0LQG SHRS0H

: &$*   )RU 8, FRPSRQHQWV ZLWK FDSWLRQV FRQWDLQLQJ WH[W RU LPDJHV IURP   XVHU
HQF0RVH WH[WV WKH QDPH LQF0XGHV WKH WH[W WKDW LV UHSUHVHQWHG   IURP
YLVXD00\   0LQJXLVWLF
    LQSXW

0RWLRQ &RQWUR0   PRWR
    ULF

: &$*   )XQFWLRQD0LW\ SURYLGHG E\ PRYHPHQW RI WKH GHYLFH RU PRYHPHQW RI WKH   SUHYHQWHG
8VHU FRQWUR00HG FDQ D0VR EH FRQWUR00HG E\ 8, FRPSRQHQWV DQG
PRWLRQ UHDFWLRQV FDQ EH WXUQHG RII WR SUHYHQW DFFLGHQWD0 WULJJHUV
XQ0HVV

$VVLVWLYH ,QWHUIDFH 0RWLRQ LV XVHG WR GULYH IXQFWLRQD0LW\ YLD DQ
DFFHVVLEL0LW\ DZDUH LQWHUIDFH

(VVHQWLD0 7KH PRYHPHQW LV HVVHQWLD0 IRU WKH IXQFWLRQ DQG
VZLWFKLQJ LW RII ZRX0G PDNH LW LPSRVVLE0H

/DQJXDJH   E0LQG SHRS0H
7KH SUHGRPLQDQW QDWXUD0 0DQJXDJH XVHG RQ HDFK ZHEVLWH LV
SURJUDP PDWLFD00\ UHFRJQL]DE0H

/DQJXDJH RI ,QGLYLGXD0 6HFWLRQV   E0LQG SHRS0H
7KH QDWXUD0 0DQJXDJH RI D00 WH[W SDVVDJHV RU H[SUHVVLRQV XVHG LV
UHFRJQL]DE0H E\ SURJUDPV

: KHQ IRFXVLQJ   E0LQG SHRS0H
: KHQ D FRPSRQHQW UHFHLYHV IRFXV LW GRHV QRW WULJJHU D FRQWH[W   YLVLRQ
FKDQJH   SUHYHQWHG
    PRWR
    ULF
    SUHYHQWHG

8SRQ (QWU   E0LQG SHRS0H
&KDQJLQJ WKH VHWWLQJ RI DQ H0HPHQW RI WKH XVHU LQWHUIDFH GRHV QRW   YLVLRQ
DXWRPDWLFD00\ 0HDG WR D FKDQJH LQ FRQWH[W XQ0HVV WKH XVHU KDV EHHQ   SUHYHQWHG
LQIRUPHG RI WKLV EHKDYLRU EHIRUH XVLQJ WKH H0HPHQW   PRWR
    ULF
    SUHYHQWHG

8QLILHG 1DYLJDWLRQ $00 JURRYH
1DYLJDWLRQ PHFKDQLVPV WKDW DUH UHSHDWHG ZLWKLQ D ZHEVLWH DSSHDU   FUXVK
LQ WKH VDPH RUGHU ZLWK HDFK UHSHWLWLRQ XQ0HVV WKH XVHU LQLWLDWHV D
FKDQJH

1 R	$FFHVVLELOLW\ FULWHULD	XVHU
8QLIRUP GHVLJQDWLRQ ,Q D ZHEVLWH DQG ZLWKLQ OLQNHG ZHEVLWHV HOHPHQWV ZLWK WKH VDPH IXQFWLRQDOLW\ DUH GHVLJQDWHG XQLIRUPO\		$OO JURXSV FUXVK
(UURU ,GHQWLILFDWLRQ ,I DQ LQSXW HUURU LV GHWHFWHG DXWRPDWLFDOO\ WKH IDXOW\ HOHPHQW LV VKRZQ DQG WKH HUURU LV GHVFULEHG WR WKH XVHU LQ WH[W IRUP		$OO JURXSV FUXVK
&DSWLRQV ,QVWUXFWLRQV RU 0DEH0V LQVFULSWLRQV PXVW EH PDGH DYDL0DEOH IRU WKH QHFHVVDU\ HQWULHV E\ XVHUV		$OO JURXSV FUXVK
6XJJHVWHG &RUUHFWLRQV ,I DQ LQSXW HUURU LV GHWHFWHG DXWRPDWLFDOO\ DQG VXJJHVWLRQV IRU FRUUHFWLRQ DUH NQRZQ WKHVH PXVW EH PDGH DYDL0DEOH WR WKH XVHU SURYLGHG WKH\ GR QRW HQGDQJHU WKH VHFXULW\ RU SXUSRVH RI WKH FRQWHQW		$OO JURXSV FUXVK
(UURU 3UHYHQWLRQ ,Q WKH FDVH RI ZHEVLWHV WKDW FUHDWH 0HJD0 RE0LJDWLRQV RU 0HDG WR ILQDQFLD0 WUDQVDFWLRQV E\ XVHUV RU FKDQJH RU GH0HWH GDWD LQ GDWD VWRUDJH V\VWHPV WKDW XVHUV FDQ FRQWUR0 RU VHQG WHVW DQVZHUV IURP XVHUV XVHUV KDYH DW 0HDVW RQH RI WKH IRO0RZLQJ RSWLRQV 7KH H[HFXWLRQ FDQ EH XQGRQH 7KH GDWD HQWHUHG ZL00 EH FKHFNHG IRU LQSXW HUURUV DQG WKHUH LV WKH RSWLRQ RI FRUUHFWLQJ WKHP LI QHFHVVDU\ 7KH LQIRUPDWLRQ FDQ EH UHYLHZHG FRUUHFWHG DQG FRQILUPHG EHIRUH LW LV ILQD00\ VHQW		$OO JURXSV FUXVK
6\QWD[$QD0\VLV &RQWHQW FUHDWHG ZLWK PDUNXS 0DQJXDJHV FRQVLVWV RI H0HPHQWV WKDW KDYH WKH IRO0RZLQJ SURSHUWLHV 7KH\ KDYH IX00 VWDUW DQG HQG WDJV WKH\ DUH QHVWHG DFFRUGLQJ WR WKHLU VSHFLILFDWLRQV WKH\ GR QRW FRQWDLQ GXS0LFDWH DWWULEXWHV DQG D00 WKHLU , ' V DUH XQLTXH XQ0HVV WKHLU VSHFLILFDWLRQV D00RZ IRU WKDW SDUWLFX0DULW\		$00 JURXSV]HU DV VLVWLYHU WHFKQR 0RJLHV
1DPH 5R0H 9D0XH $00 XVHU LQWHUIDFH FRPSRQHQWV DUH SURJUDP PDWLFD00\ UHFRJQL]DE0H E\ QDPH DQG UR0H 6WDWHV SURSHUWLHV DQG YD0XHV WKDW FDQ EH VHW E\ XVHUV FDQ D0VR EH VHW E\ D SURJUDP : KHQ WKHVH VWDWHV SURSHUWLHV DQG YD0XHV FKDQJH XVHU DJHQWV LQF0XGLQJ DVVLVWLYH WHFKQR0RJLHV DUH QRWLILHG		$00 JURXSV]HU DV VLVWLYHU WHFKQR 0RJLHV
6WDWXV 0HVVDJHV		E0LQG SHRS0H

No	Accessibility criteria	User
WCAG	In content implemented with markup languages status messages are programmatically determined by roles or properties so that they can be presented by assistive technologies without preserving focus	vision prevented user assistive technologies

Table: Overview of the accessibility criteria

' 8VHU *URXSV 5HVWULFWLRQV

7KH DFFHVVLELOLW\ UHTXLUH PHQWV DQG FULWHULD OLVWHG LQ WKLV GRFXPHQW HQVXUH WKDW WKH DSSOLFDWLRQ FDQ EH XVHG E\ GLIIHUHQW XVHU JURXSV VXEMHFW WR GLIIHUHQW UHVWULFWLRQV

7KH IRFXV KHUH LV SULPDULO\ RQ WKH XVHUV SUHVHQWHG EHORZ +RZHYHU WKHUH DUH D QXPEHU RI RWKHU XVHU JURXSV DV LQGLFDWHG E\ WKH FRQWHQWV RI WKH 8VHUV FROXPQ LQ 7DEOH H J SKRWRVHQVLWLYH VHL]XUH VXIIHULQJ RU FRJQLWLYHO\ LPSDLUHG XVHUV

9LVXDOO\ ,PSDLUHG 8VHUV

9LVXDOO\ LPSDLUHG XVHUV FDQ EH LPSDLUHG LQ D YDULHW\ RI ZD\V LQ WKHLU YLVXDO SHUFHSWLRQ)RU H[DPSOH WKH\ PD\ KDYH D GLIIHUHQW FRORU SHUFHSWLRQ RU UHTXLUH KLJKO\ PDJQLILHG YLHZV RI WKH VXUIDFH)RU YLVXDOO\ LPSDLUHG XVHUV WKH RQ VFUHHQ GLVSOD\ PXVW EH FOHDU DQG IOH[LEOH ,QIRUPDWLRQ VKRXOG EH DYDLODEOH UHJDUGOHVV RI FRORU DQG SURYLGH VXIILFLHQW FRQWUDVW EHWZHHQ IRUHJURXQG DQG EDFNJURXQG 7KLV LV SDUWLFXODUO\ LPSRUWDQW IRU XVHUV ZLWK SRRU FRORU YLVLRQ H J ZLWK UHG JUHHQ ZHDNQHVVHV 7KH 0D\RXW HVSHFLDOO\ WKH IRQW VL]H VKRXOG EH DEOH WR EH DGMXVWHG LQGLYLGXDOO\ $ FRQVLVWHQW DUUDQJHPHQW RI WKH VFUHHQ HOHPHQWV LI SRVVLEOH LQ D JULG 0D\RXW LV LPSRUWDQW VR WKDW XVHUV FDQ RULHQWDWH WKHPVHOYHV RQ YLUWXDO URZV DQG FROXPQV ZKHQ XVLQJ DVVLVWLYH WHFKQRORJLHV VXFK DV PDJQLILFDWLRQ SURJUDPV VR FDOOHG

)RU F0HDU GLIIHUHQWLDWLRQ LQ WKLV VWXG\ XVHUV ZLWK 0RZ UHVLGXDO YLVLRQ ZKR VWL00 QHHG D VFUHHQ UHDGHU DUH VXEVXPHG XQGHU E0LQG XVHUV

%0LQG 8VHUV

%0LQG XVHUV FDQQRW VHH WKH VXUIDFH DQG WKHUHIRUH FDQQRW SRVLWLRQ D PRXVH LQ D PHDQLQJIX0 ZD\ ,Q RUGHU IRU E0LQG XVHUV WR KDYH DFFHVV WKH SDJHV RI DQ DSSOLFDWLRQ RI DVVLVWLYH WHFKQRORJ\ WKDW UHS0DFHV WKH JUDSKLF UHSUHVHQWDWLRQ RQ WKH VFUHHQ ZLWK D0WHUQDWLYH RXWSXWV H J VSHHFK EUDL00 PXVW EH DFFHVVLE0H 7KH FRQWHQW PXVW WKHUHIRUH EH DE0H WR EH UHDG FRUUHFW0\ E\ VR FD00HG VFUHHQ UHDGHUV RU RXWSXW FRUUHFW0\ E\ %UDL00H NH\ERDUGV ,PSRUWDQW FRQGLWLRQV IRU WKLV DUH H J % XVDE0H WH[W D0WHUQDWLYHV IRU QRQ WH[W FRQWHQW VXFK DV LPDJHV DQG YLGHRV 0LQHDUL]DEL0LW\ RI WKH SDJHV DQG D VHPDQWLFD00\ FRUUHFW PDUNXS XVH RI WKH *8, H0HPHQWV 7KH DSS0LFDWLRQ PXVW D0VR EH IX00\ FRQWUR00DE0H YLD NH\ERDUG

0RWRUL]HG XVHUV

8VHUV ZLWK PRWRU GLVDEL0LWLHV DUH XQDE0H WR PHHW WKH KLJK 0HYH0 RI ILQH PRWRU VNL00V DQG KDQG H\H FRRUGLQDWLRQ UHTXLUHG IRU PRXVH RSHUDWLRQ -XVW 0LNH E0LQG XVHUV WKH\ UH0\ RQ WKH IDFW WKDW WKH DSS0LFDWLRQ FDQ EH FRQWUR00HG HQWLUH0\ YLD WKH NH\ERDUG 2I FRXUVH YRLFH FRQWUR0 ZRX0G D0VR EH FRQFHLYDE0H +RZHYHU WKLV LV XVXD00\ QRW \HW RIIHUHG E\ EXVLQHVV DSS0LFDWLRQV

+HDULQJ ,PSDLUHG 8VHUV

+HDULQJ LPSDLUHG XVHUV FDQ EH PRUH RU 0HVV VHYHUH0\ UHVWULFWHG LQ WKHLU KHDULQJ DQG RU FRPS0HWH0\ GHDI 7KHVH XVHUV FDQQRW RU RQ0\ LQVXIILFLHQW0\ SHUFHLYH DFRXVWLF RXWSXWV DQG VLJQD0V)RU H[DPS0H LI DQ DSS0LFDWLRQ XVHV H J DXGLR VLJQD0V RU LQF0XGHV DXGLR RU YLGHR ZLWK DXGLR RXWSXW WKLV LQIRUPDWLRQ PXVW EH DYDL0DE0H WKURXJK D0WHUQDWLYH PHDQV H J DGGLWLRQD0 YLVXD0 LQGLFDWRUV RU VXEWLW0HV 'HSHQGLQJ RQ WKH W\SH RI DSS0LFDWLRQ DQG WKH FRQWHQW LW PD\ D0VR EH DGYLVDE0H WR LPS0HPHQW FRQWHQW LQ VLJQ 0DQJXDJH

)L0H QDPH -HQNLQVB$FFHVVLEL0LW\,QYHVWLJDWLRQB5HSRUW GRFP

9HUVLRQ

: DV VDDQGLQJ

6WDWXV)LQD0

3URMHFWLRQ F0DVV

,QIHUQD0

7KH IR00RZLQJ GHFLVLRQ JUDSK L00XVWUDWHV WKH FDWHJRUL]DWLRQ RI WKH ILQGLQJV

)LJXUH   ' HFLVLRQ JUDSK IRU FDWHJRUL]LQJ LGHQWLILHG DFFHVVLELOLW\ LVVXHV

' HSHQGLQJ RQ WKH UH0HYDQFH RI WKH SURE0HP IRU D VSHFLILF XVHU JURXS RU WKH VRXUFH LW FDQ EH GRZQJUDGHG RU XSJUDGHG

) ' HF0DUDWLRQ RI ,QGHSHQGHQFH

7KH WHVWV IRU XVDELOLW\ VXLWDELOLW\ IRU XVH RU DFFHVVLELOLW\ IUHHGRP IURP EDUULHUV RI SURGXFWV VHUYLFHV DQG DSS0LFDWLRQ VR0XWLRQV FDUULHG RXW E\ WKH 8VDELOLW\ $FFHVVLELOLW\ 7HDP RI 'HXWVFKH 7H0HNRP ,7 *PE+ ('7237   WDNH S0DFH RQ WKH EDVLV RI ',1 ,62   WKH 5HJX0DWLRQ IRU WKH FUHDWLRQ EDUULHU IUHH LQIRUPDWLRQ WHFKQR0RJ\ LQ DFFRUGDQFH ZLWK WKH 'LVDELOLW\ (TXD0LW\ $FW %,79   DQG WKH :HE &RQWHQW $FFHVVLELOLW\ *XLGH0LQHV   :&$*   DQG DUH LPSDUWLD0 DQG LQGHSHQGHQW UHJDUG0HVV RI ZKHWKHU WKH SURGXFWV DQG VR0XWLRQV DUH IURP 7 6\VWHPV RU 7H0HNRP FRPSDQLHV *URXS RU RWKHU FRPSDQLHV

/LVW RI)LJXUHV

)LJXUH   ([DPSOH VFUHHQVKRW RI WKH DSSOLFDWLRQ

)LJXUH   6NLS OLQN QRW YLVLEOH ZKHQ PDLQWDLQLQJ IRFXV

)LJXUH   -XPS WDUJHW RI WKH VNLS OLQN QRW FRUUHFWO\ UHIHUHQFHG

)LJXUH   0LVVLQJ LGHQWLILFDWLRQ RI WKH PDLQ FRQWHQW DUHD DV D SDJH DUHD

)LJXUH   )RFXV GRHV QRW FKDQJH WR FRQWHQW DUHD DIWHU VHOHFWLQJ D PHQX LWHP
VHW EXW WKH WRS RI WKH SDJH

)LJXUH $IWHU VHOHFWLQJ D UDGLR EXWWRQ WKH IRFXV LV RQ WKH WRS RI WKH SDJH
VHW

)LJXUH   6KRUW UHSRUW RQO\ DFFHVVLEOH YLD WRROWLS YLD : HDWKHU LFRQ

)LJXUH   2SHQ 0RJV LQ 6WDJH 9LHZ WDEOH RQO\ DFFHVVLEOH YLD WRROWLS

)LJXUH   2SHQ 0RJV LQ 6WDJH 9LHZ WDEOH RQO\ DFFHVVLEOH YLD WRROWLS

)LJXUH   /HJHQGV IRU WKH WUHQG FKDUWV RQO\ DFFHVVLEOH YLD WRROWLS

)LJXUH   &RQWH[W PHQXV ZLWKLQ WKH WDEOHV RQO\ DFFHVVLEOH YLD WRROWLS

)LJXUH   &RQWH[W PHQXV ZLWKLQ WKH EUHDGFUXPE RQO\ DFFHVVLEOH YLD WRROWLS   )LJXUH
0HQX VHOHFWRUV DUH QRW YLVLEOH

)LJXUH   EXW FDQ EH RSHUDWHG ZLWK WKH PRXVH DQG EULQJ LQ
&RQWH[W PHQX IRU YLHZ

)LJXUH   2YHUYLHZ RI FRPPLWV RQO\ DFFHVVLEOH YLD WRROWLS

)LJXUH   8QXVXDO NH\ERDUG QDYLJDWLRQ EHWZHHQ WDEV

)LJXUH   &RQIXVLQJ QDYLJDWLRQ PHQX KHUH EUDQFK 0HYH0 YV EXLOG
/HYH0

)LJXUH   3RVLWLYH 3DWK VSHFLILFDWLRQ VXSSRUWV WKH RULHQWDWLRQ

)LJXUH   +H0S LFRQV DUH DW WKH EHJLQQLQJ RI WKH IRFXV RUGHU   ([DPSOH
3HUVRQD0 VHWWLQJV SDJH

)LJXUH   +H0S LFRQV DUH DW WKH EHJLQQLQJ RI WKH IRFXV RUGHU   ([DPSOH
&RQILJXUH SDJH

)LJXUH   9LVXD0 KHDG0LQH QRW VHPDQWLFD00\ VWUXFWXUHG

)LJXUH   &RUUHFW UR0HV IRU WDEV DUH PLVVLQJ

)LJXUH   0LVVLQJ FR0XPQ GHVLJQDWLRQ   ([DPSOH ' DVKERDUG ! 7DE0H

)LJXUH   0LVVLQJ FR0XPQ GHVLJQDWLRQ   H[DPSOH WHVW SURMHFW XVDEL0LW\
' DVKERDUG ! 8VDEL0LW\ IR0GHU ! 7DE0H

)LJXUH   0LVVLQJ FR0XPQ 0DEH0   ([DPSOH ' DVKERDUG !)R0GHUV
8VDEL0LW\ ! 3URMHFW 8VDEL0LW\ ! 7DE0H

)LJXUH $EEUHYLDWHG QRQ VH0I GHVFULSWLYH FR0XPQ KHDGLQJV H[DPSOH
' DVKERDUG ! 8VDEL0LW\ IR0GHU ! 8VDEL0LW\ SURMHFW ! 7DE0H

)LJXUH   ([S0DQDWLRQ RI : GLVS0D\HG RQ PRXVH RYHU ([DPS0H ' DVKERDUG
!)R0GHU 8VDEL0LW\ ! 3URMHFW 8VDEL0LW\ ! 7DE0H

)LJXUH   0LVVLQJ KHDGLQJ PDUNXS ([DPS0H 'DVKERDUG !)R0GHU

8VDEL0LW\ ! 3URMHFW 8VDEL0LW\ ! 5HSRVLWRU\ MHQNLQV GHPR ! %UDQFK GRFNHU

%UDQFK 9LHZ 7DE0H 6WDJH 9LHZ

)LJXUH   6WUXFWXUH PDUNXS XVHG IRU 0D\RXW WDE0H ([DPS0H 'DVKERDUG !)R0GHU

8VDEL0LW\ ! 3URMHFW 8VDEL0LW\ ! 7DE0H

)LJXUH   /LQNHG JUDSKLF QRW F0HDU0\ 0DEH0HG H[DPS0H WH[W JUDSKLF

-HQNLQV LQ WKH KHDGHU

)LJXUH   /LQNHG JUDSKLF QRW F0HDU0\ 0DEH0HG H[DPS0H +H0S LFRQ LQ

6HDUFK ILH0G

)LJXUH $PELJXRXV 0LQN 0DEH0 LQ WKH PHQX H[DPS0H EXL0G SDJH

)LJXUH   (PSW\ 0LQNHG FR0XPQ KHDGLQJV H[DPS0H SURMHFW WDE0H

)LJXUH   8QPDUNHG IDYRULWHV LFRQ H[DPS0H SURMHFW WDE0H

)LJXUH   /LQNHG FR00DSVH DQG H[SDQG LFRQV DUH QRW FRPS0HWH

DQG FRUUHFW0\ 0DEH0HG

)LJXUH   +H0S LFRQV DQG IDYRULWHV LFRQV DUH QRW 0DEH0HG H[DPS0H

8VHU 3URIL0H ! 6HWWLQJV

)LJXUH   +H0S LFRQV DUH QRW 0DEH0HG H[DPS0H WHVW SURMHFW XVDEL0LW\

'DVKERDUG ! 8VDEL0LW\ IR0GHU ! 8VDEL0LW\ SURMHFW ! &RQILJXUH

)LJXUH   /DEH0V DUH QRW UHFRJQL]HG E\ WKH VFUHHQ UHDGHU H[DPS0H

3HUVRQD0 VHWWLQJV SDUW

)LJXUH   /DEH0V DUH QRW UHFRJQL]HG E\ WKH VFUHHQ UHDGHU H[DPS0H

3HUVRQD0 VHWWLQJV SDUW

)LJXUH   *UDSKLF FRQWHQW ZLWKRXW WH[W D0WHUQDWLYHV 8VDEL0LW\ SURMHFW

)LJXUH   'HFRUDWLYH JUDSKLF EHIRUH WKH K ! KHDGLQJ QRW PDUNHG DV VXFK

([DPS0H %XL0G KLVWRU\ RI UHSRVLWRULHV

)LJXUH   'HFRUDWLYH JUDSKLF LQ IURQW RI DJHQW 0LQN VGF0RXG MHQNLQV   QRW DV VXFK

([FH00HQW ([DPS0H 1RGH 9LHZ

)LJXUH   9DULRXV GHFRUDWLYH JUDSKLFV QRW PDUNHG DV VXFK

([DPS0H %XL0G 9LHZ

)LJXUH   'HFRUDWLYH JUDSKLFV LQ WKH ILUVW FR0XPQ RI WKH WDE0H DUH QRW DV VXFK

H[FH00HQW H[DPS0H XVHU RYHUYLHZ

)LJXUH   'RXE0H WH[W D0WHUQDWLYH ZLWK GHFRUDWLYH JUDSKLFV QRW DV VXFK

H[FH00HQW H[DPS0H -HQNLQV 0RJR LQ WKH KHDGHU

)LJXUH   3RVLWLYH LPSRUWDQW FRQWHQW LV QRW RYHU0DLG DW   PDJQLILFDWLRQ

)LJXUH   0HQX DW   PDJQLILFDWLRQ 3DUW

)LJXUH   0HQX DW   PDJQLILFDWLRQ 3DUW

)LJXUH   0HQX DQG EXL0G KLVWRU\ DW   PDJQLILFDWLRQ 3DUW

)LJXUH $IWHU WKUHH VFUHHQ SDJHV ILQD00\ FRQWHQW DW   PDJQLILFDWLRQ   )LJXUH

3RVLWLYH FRUUHFW EUHDN DW   PDJQLILFDWLRQ

)LJXUH   0LVVLQJ YHUWLFD0 0HJHQG DW   PDJQLILFDWLRQ

)LJXUH   'LIILFX0W WR VHH LQIRUPDWLRQ LQ WKH WLPH0LQH LQ WKH EXL0G KLVWRU\

)LJXUH   %DG0\ UHFRJQL]DE0H VL]HV RI WKH EXL0G DUWLIDFWV LQ WKH EXL0G VWDWXV

)LJXUH   'LIILFX0W WR VHH LQIRUPDWLRQ LQ WKH 6WDJH 9LHZ WDE0H %UDQFK 'RFNHU

)LJXUH   : DUQLQJV DUH KLJK0LJKWHG LQ \H00RZ IRQW

)LJXUH   'LIILFX0W WR VHH GLIIHUHQFH EHWZHHQ IRFXVHG DQG QRW
    IRFXVHG EXWWRQV

)LJXUH   'LIILFX0W WR VHH GLIIHUHQFH EHWZHHQ IRFXVHG DQG QRW
    IRFXVHG EXWWRQV

)LJXUH   *UDSKLF FRQWHQW LV FRQYH\HG H[F0XVLYH0\ E\ FR0RU SURMHFW
    8VDEL0LW\

)LJXUH   7KH KWP0! H0HPHQW GRHV QRW KDYH D 0DQJ DWWULEXWH

)LJXUH   1RW D00 PHQX LWHPV DUH WUDQV0DWHG

)LJXUH   1RW D00 WH[WV RQ WKH EXL0G SDJH DUH WUDQV0DWHG D0VR KDV WKH
    %XWWRQ DQ (QJ0LVK GHVLJQDWLRQ   'RQ W NHHS

)LJXUH   0L[RI *HUPDQ DQG (QJ0LVK LQ WKH XVHU VHWWLQJV

)LJXUH   0L[RI *HUPDQ DQG (QJ0LVK ZKHQ FUHDWLQJ \RXU RZQ YLHZ

)LJXUH   'HFLVLRQ JUDSK IRU FDWHJRUL]LQJ GHWHU PLQHG
    $FFHVVLEL0LW\ ,VVXHV

/LVW RI 7DE0HV

ELE0LRJUDSK\

>$&B+H00EXVFK@ $FFHVVLEL0LW\ FKHFN0LVW -DQ +H00EXVFK KWWS
ZZZ KH00EXVFK GH DFFHVVLELOLW\ FKHFN0LVWH

>%*B*@ $FW RQ (TXD0 2SSRUWXQLWLHV IRU 3HRS0H ZLWK 'LVDEL0LWLHV 'LVDEL0LW\
(TXD0LW\ $FW %*B*
KWWSV ZZZ JHVHWJH LP LQWHUQHW GH EXQGHVUHFKW EJJ JHVDPW SGI

>%,79B@ 2UGLQDQFH RQ WKH FUHDWLRQ RI EDUULHU IUHH LQIRUPDWLRQ WHFKQR0RJ\ LQ
DFFRUGDQFH ZLWK WKH 'LVDEL0LW\ (TXD0LW\ $FW %DUULHU IUHH ,QIRUPDWLRQ
7HFKQR0RJ\ 2UGLQDQFH %,79
KWWS ZZZ JHVHWJH LP LQWHUQHW GH ELWYB B %-15 KWP0

>%,79HVW@ 7KH %,79 WHVW 0LVW RI WHVW VWHSV KWWSV ZZZ ELWYWHVW GH ELWYWHVW
GDVBWHVWYHUIDKUHQBLPBGHWDL0 SUXHIVFKULWWHQ KWP0

>*3,,BB'HY6SDFH@ 'HYH0RSHU 6SDFH RI WKH *0RED0 3XE0LF ,QF0XVLYH ,QIUDVWUXFWXUH 7KH
RQHVWRS S0DFH WR ILQG UHVRXUFHV FRPSRQHQWV DQG SHRS0H WR FRQFHLYH
GHYH0RS WHVW DQG PDUNHW QRYH0 DFFHVVLE0H VR0XWLRQV
KWWSV GV JSLL QHW

>,62BB@ ',1 (1 ,62 (UJRQRPLFV RI KXPDQ PDFKLQH LQWHUDFWLRQ
3DUW 8VDEL0LW\ UHTXLUHPHQWV

>,62BB@ ',1 (1 ,62 (UJRQRPLFV RI KXPDQ PDFKLQH LQWHUDFWLRQ
3DUW 3ULQFLS0HV RI LQIRUPDWLRQ SUHVHQWDWLRQ

>,62BB@ ',1 (1 ,62 (UJRQRPLFV RI KXPDQ PDFKLQH LQWHUDFWLRQ
3DUW 3ULQFLS0HV RI GLD0RJXH GHVLJQ

>,62BB@ ',1 (1 ,62 (UJRQRPLFV RI KXPDQ PDFKLQH LQWHUDFWLRQ
3DUW *XLGH0LQHV IRU WKH DFFHVVLEL0LW\ RI VRIWZDUH

>,62BB@ ,62 ,(,QIRUPDWLRQ WHFKQR0RJ\ : & : HE &RQWHQW
$FFHVVLEL0LW\ *XLGH0LQHV : &$*

>:&$*B@ : HE &RQWHQW $FFHVVLEL0LW\ *XLGH0LQHV : &$*
KWWSV ZZZ Z RUJ 75 : &$*

>:&$*B@ : HE &RQWHQW $FFHVVLEL0LW\ *XLGH0LQHV : &$*
KWWSV ZZZ Z RUJ 75 : &$*

>:&$* 8QGHUVW@ 8QGHUVWDQGLQJ : &$* $ JXLGH WR XQGHUVWDQGLQJ DQG LPS0HPHQWLQJ
: HE &RQWHQW $FFHVVLEL0LW\ *XLGH0LQHV
KWWSV ZZZ Z RUJ 75 81'(567$1',1* : &$*

&KDQJH +LVWRU\   5H0HDVH 1RWHV

1RWH 7KH 0DWHV YHUVLRQ LV YD0LG 20GHU YHUVLRQV ZL00 DXWRPDWLFD00\ EHFRPH LQYD0LG

YHUVLRQ	VWDWXV	$XWKRU (GLWRU	&KDQJHV FRPPHQW
II	,Q 3URJUHVV	&RUGX0D 80EULFKW	,QLWLD0 FUHDWLRQ DQG RQJRLQJ DGGLWLRQ RI FRQWHQW
	7R WKH UHYLHZ	&RUGX0D 80EULFKW	&RPS0HWH 4XD0LW\ $VVXUDQFH ' RFXPHQW
	FRPPHQWHG	)UDQN %UHLGHQVWHLQ	' RFXPHQW LQF0XGLQJ UHYLHZ FRPPHQWV
	)LQD0	&RUGX0D 80EULFKW	3XE0LVKHG ' RFXPHQW

GLVWULEXWLRQ 0LVW

6XUQDPH	IXQFWLRQ FRPSDQ\
$[H0 /DQJZD0G	&0LHQW 7 6\VWHPV ,QWHUQDWLRQD0 *PE+
.0DXV .¾QNH0H	&0LHQW UHSUHVHQWDWLYH 7 6\VWHPV ,QWHUQDWLRQD0 *PE+
,0GLNR 6]HNH0\	7HFKQLFD0 FRQWDFW ' HXWVFKH 7H0HNRP 6\VWHPV 6R0XWLRQV +XQJDU\ .IW
0DUFXV /RQJ	3URGXFW 2ZQHU IRU ' HY2SV DV D 6HUYLFH 7 6\VWHPV ,QWHUQDWLRQD0 *PE+
%RULV)0HJHPDQ	6HUYLFH 0DQDJHU IRU ' HY2SV DV D 6HUYLFH 7 6\VWHPV ,QWHUQDWLRQD0 *PE+