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' S Q T I X I R G] * V E Q I

A success pipeline from
college to university
and beyond

SEPTEMBER 2021



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The team is composed of members of the Dawson College and Concordia University communities who
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4 V S N I G X O I E H W

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Lindsay Vargas (E[WSR 'SPPIKI

% G O R S [P I H K I Q I R X W

;I I\TVIWW SYV KVEXMXYHI XS 4-PI QSRXV£EPEMW H...IRWIMKRIQIRX
JSV TVSZMHMRK E KVERX XS WYTTSVX XLI HIZIPSTQIRX SJ XLMW EV
3YV TVSNIGX IQFVEGIW 4-%...W QMWWMSR XS IRGSYVEKI LMKLIV IHY
VIWTSRH GSPPIGXZIP] MR EHHVIWWMRK XVEMRMRK ERH HIZIPSTQI
MRXIPPMKIRGI ¼IPH

The Concordia University and Dawson College project is one of 14 collaborative projects from partner universities and colleges to develop training and competency framework projects.

% WTIGMEP [SVH SJ XLEROW XS &IRSMX 4EK£ JSV LMW WYTTSVX XS

4 - % was created to ensure that college and university programs remain aligned with industry needs and to shed light on the social and ethical considerations related to the rise of AI. PIA supports post-secondary institutions to effectively create and YTHEXI EGEHIQMG TVSKVEQW MR SVHIV XS V AI needs.

;I EVI EPWS KVEXIJYP JSV XLI WYTTSVX VIGIMZIH JVSQ SYV MRWXM



' S R G S V H M E ' S R X M R Y M o r e s d i s t i n c t i o n e X M S R
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professional and organizational growth needs of our society.
3RI HE] EX E XMQI [I MRZMXI TISTPI JVSQ HM
and stages of life to take part in trend setting trainings that
generate concrete results.



(E [W S R ' S M W I K L I P E V K I W X G S P P I K I M R 5 Y I F
RIX[SVO LSQI XS WXYHIRXW MR ¼IPH
provide a welcoming and stimulating environment in which to
PIEVR ERH [SVO ERH [LIVI WXYHIRXW EVI TVI
role as productive and responsible citizens of the world.

% Y H M I R G I

The intended audience for this document includes:

4 V M Q E V]

1. Educators

y ,MKLIV IHYGEXMSR JEGYPX] XIEGLMRK MR XIGLRMGEP ¼
EVXM ¼ GMEP MRXIPPMKIRGI

y Higher education faculty looking at integrating AI competencies
in the curriculum

2. Program developers

- y Curriculum developers
- y Instructional designers
- y Course developers

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4 V S K V E Q E H Q M R M W X V E X S V W S J E V X M ¼ G M E P M R X I P P M

2. Student success centers looking at developing complimentary trainings for technical or
non- technical students

3. Training managers and human resource managers responsible for developing employees
[S V O M R K M R E V X M ¼ G M E P M R X I P P M K I R G I

4. Prior learning coordinators

y 6 I G S K R M X M S R S J E G U Y M V I H G S Q T I X I R G M I W 6 % ' G S S V H

y : E P M H E X M S R S J G S Q T I X I R G M I W : S ' G S S V H M R E X S V W

'SQTIXIRG] (SQEMRW EX E +PERGI

8LI KSEP SJ XLMW %- GSQTIXIRG] JVEQI[SVO MW XS SYXPMRI XLI (ERH EFMPMXMIW VIUYMVIH F] %- TVEGXXMSRIVW MR XLI XIGLRM MR XLI 1SRXVIEP %- GSRXI\X ;MXL IXLMGW FIMRK MRXIKVEP XS X IXLMGEP GSQTIXIRGMIW LEZI FIIR MRXIKVEXIH MRXS XLI XIGLRMG

8LMW GSQTIXIRG] JVEQI[SVO MW E XSSP JSV ZEVMSYW IHYGEXMSF HIZIPSTIVW ERH TVMSV PIEVRMRK GSSVHMREXSVW MRZSPZIH MR MRGITXMSR XS MQTPIQIRXEXMSR 8LMW QIERW XLEX XLI GSQTIXIR XLI GSQTIXIRGMIW VIUYMVIH JSV E WTIGM¼G VSPI MR %- WYGL E XLI GSQQR WIX SJ GSQTIXIRGMIW VIUYMVIH F] %- TVEGXXMSRIV

	8 I G L R M G E P	& Y W M R I W W	, Y Q E R
8 L I Q I	y Data	y AI Initiative and Project Planning	y Innovation
	y Mathematics and Statistics	y AI Initiative and Project Scaling	y Teamwork
	y Programming	y AI Technologies	y Professionalism
	y 1 E G L M R I 0 I E V R M R K		
	y (I I T 0 I E V R M R K		
	y Infrastructure		
	y 0 M F V E V M I W E R H * V E Q I [S V O W		

,S[XS 6IEH XLI 'SQTIXIRG] *VEQI[SVO

-R SVHIV XS FIWX WIVZI SYV RSR XIGLRMGEP EYHMIRGI IEGL HSQE AI competency framework has been divided into six sections. The division allows for our non-technical EYHMIRGI XS JEQMPMEVM^I XLIQWIPZIW [MXL XLI WTIGM¼G HSQEMR competencies at a more granular level.

- * S G Y W % V I E high-level terms used to describe the category of competencies presented.
- * S V I \ E Q T A Is a focus area for the technical domain
- * S G Y W % V I E 8 L I Q I

% - ' S Q T I X I R G] * V E C
8 I G L R M G E P (S Q E M R





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 1 EXLIQEX M G W
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 Q M F V E V
 V E O

)\EQTPIW SJ PMFVEVMIW ERH JVEQI[SVOW
4]XLSR 6 ' ' .EZE .YPME
Data Preprocessing
Prepare features for use in supervised or non-supervised learning tasks
'SQTYXI JIEXYVIW JSV HMJJIVIRX X]TIW SJ HEXE WYGL EW
1.1.1.1 Encode categorical data
1.1.1.2 Identify and correct errors in categorical data
1.1.1.3 Normalize/standardize features
1.1.1.4 Reduce dimensionality of high-dimension datasets
1.1.1.5 Compute features in time windows
'VIEXI E HEXE HMGXMSREV] EPWS GEPPIH GSHIFSSO XS HSGYC
pretations of features in the dataset
)ZEPYEXI JIEXYVIW JSV YWI MR 10 QSHIPW
1.1.2.1 Compute feature correlation matrices
1.1.2.2 Detect outliers from features
1IEWYVI JIEXYVI MQTSVXERGI JVSQ 10 QSHIPW
1.2 Establish data pipelines
Connect data sources to models
1.2.2 Use data structures native to machine learning libraries
Resample large datasets
Supervised Learning
Manage a supervised learning framework
(MZMHI HEXE MRXS XVEMR XIWX ERH ZEPMHEXMSR WIXW
2.1.1.1 Apply k-fold validation
2.1.1.2 Apply leave-one-out validation
2.1.1.3 Apply validation in a multi-class context
2.1.2 %TTP] GSVVIGX TIVJSVQERGI QIEWYVIW JSV VIKVIWWMSR ERH FMR
2.1.2.1 Identify correct measures
2.1.2.2 Evaluate model performance
8YRI L]TIVTEVEQIXIVW SJ GPEWWM¼GEXMSR ERH VIKVIWWMSR QIXL
2.1.3.1 Apply grid search
2.1.3.2 Apply optimization methods
Handle class imbalance
2.1.4.1 Resample the training set to adjust class distributions
2.1.4.2 Simulate entries in the minority classes
%HNYWX GPEWW [IMKLXW MR GPEWWM¼GEXMSR QIXLSHW
%TTP] WYTIVZMWIH PIEVRMRK XS WTIGM¼G XEWOW
4EVEQIXVM^I ERH ETPP] GPEWWM¼GEXMSR QIXLSHW
'SRXVEWX GPEWWM¼GEXMSR QIXLSHW
7IPIGX GPEWWM¼GEXMSR QIXLSH JSV XEWO
4EVEQIXIVM^I GPEWWM¼GEXMSR QIXLSH
2.2.1.4 Apply ensemble methods
2.2.1.5 Apply semi-supervised learning methods
9WI QEGLMRI PIEVRMRK PMFVEVMIW JSV GPEWWM¼GEXMSR

(EXE
 ERH 1EXL
 7XEXM MG
 WSKY
 WQOMR
 KEGLMR
 R
 OIEVR
 RK
 OIEVR
 RK
 R
 JVEW
 XY
 YGERH
 QM
 FVEV
 VEO

-HIRXMJ] XLI VSPI XLEX E LYQER GER TPE] JVSQ E ,YQER MR XLI P and when to defer to human in the context of the AI system to make a decision WE] [LIR XLI %- W]WXIQ MW YRGIVXEMR MR MXW HIGMWMSR
Evaluate the relevance and representativeness of synthetic data to avoid issues of bias GSRWYPX [MXL HSQEMR I\TIVXW
%VXM¼GMEP 2IYVEP 2IX[SVOW
Use general multi-layer neural networks
Build multi-layer neural networks
2.1.1.1 Apply perceptrons
2.1.1.2 Build multi-layer neural networks
2.1.1.3 Select activation functions
2.1.1.4 Select loss functions
2.1.1.5 Understand optimizers
Apply multi-layer neural networks for supervised learning
2.1.2.1 Tune neural network hyperparameters 'SR¼KYVI HVSTSYX ERH VIKYPEVM^EXMSR
2.1.2.3 Evaluate multi-layer perceptrons
2.1.2.4 Apply multi-layer perceptrons to regression problems %TTP] QYPXM PE]IV TIVGITXVSRW XS GPEWWM¼GEXMSR TVSFPI
9WI WTIGM¼G HIIT PIEVRMRK QSHIPW
1SHIP HEXE [MXL 'SRZSPYXMSREP 2IYVEP 2IX[SVOW '22W
2.2.1.1 Build Convolutional Neural Networks
2.2.1.2 Build graph convolutional networks
2.2.1.3 Train convolutional networks
2.2.1.4 Apply convolutional networks to image data
2.2.1.5 Apply convolutional networks to video data 1SHIP HEXE [MXL 6IGYVVIRX 2IYVEP 2IX[SVOW 622W
2.2.2.1 Build Recurrent Units
2.2.2.2 Build long/short term memory units
2.2.2.3 Build Transformers
2.2.2.4 Train RNNs
2.2.2.5 Apply RNNs to textual data
2.2.2.6 Apply RNNs to time series data
2.2.2.7 Apply RNNs to sensors data
Generate data with deep learning models
2.2.3.1 Build autoencoders
2.2.3.2 Build generative adversarial networks
2.2.3.3 Generate textual data +IRIVEXI WMKREPW WYGL EW MQEKI ZMHIS WSYRH OIEVR FILEZMSVW [MXL HIIT VIMRJSVGIQIRX PIEVRMRK 60 %TTP] ZEPYI FEWIH QIXLSHW JSV HIIT 60 %TTP] TSPMG] KVEHMIRX QIXLSHW JSV HIIT 60 %TTP] QSHIP FEWIH QIXLSHW JSV HIIT 60 &IRGLQEVO HIIT 60 %TTP] HIIT 60 XS ZEVMSYW HSQEMRW WYGL EW VSF SXMGW ZM
)\EQTPIW SJ PMFVEVMIW ERH JVEQI[SVOW
4]XSVGL 8IRWSV½S[/IVEW





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& Y W M R I W W (S Q E M R

(1¼RI [LEX MW GSRWMHIVI (deparIRg na pEject) ^RSX HSRI%
1.4.3. Consolidate the project roadmap
(1¼RI TVSNIGX TLEWIW ERH OI] QMPIWXSRIW
2IKSXMEXI JVIUYIRG] SJ I\IGYXMZI WXIIVMRK GSQQMXXII PIZIP and presentations
4VIWIRX TVSNIGX TPERRMRK XS HMZIVWI EYHMIRGIW WYGL EW
4VIWIRX XLI IRZMWMSRIH EKMPI QIXLSHSPSK] WYGL EW MXW E
1.4.3.4. Incorporate insights from external stakeholders for ethics considerations in the project roadmap
Data and AI Project Execution
Manage internal technical and multidisciplinary teams
2.1.1. 0IEH %- MQTPIQIRXEXMSRW
(1¼RI VSPIW ERH VIWTSRWMFMPMXMIW
2.1.1.2. Facilitate discussions on high-level working agreements
2.1.1.3. Monitor overall project progress
2.1.1.4. Monitor individual contributor workload
2.1.1.5. Establish working group on ethics considerations
2.1.2. Overcome existing and new roadblocks
2.1.2.1. Negotiate workarounds
2.1.2.2. Justify need for new resources
2.1.2.3. Establish channels between departments for ethics considerations
2.1.3. Establish project management artifacts and tools
2.1.3.1. Facilitate agile/scrum ceremonies
7IX YT TVSNIGX QEREKIQIRX ERH TVSHYGXMZMX] IRZMVSRQIRX
2.1.4. Coach individual contributors
)WXMQEXI VIUYMVIH WYTTSVX FEWIH SR WMXYEXMSREP PIEHIV
2.1.4.2. Prepare action plan for customized support per member/role
'LIGO MR SR GSRXVMFYXSVW MRHMZMHYEPP] SR E VIKYPEV FE
2.1.4.4. Ensure completion of ethics training prior to start of project work
Manage external and other business stakeholders
2.2.1. Establish realistic expectations amongst stakeholders
2.2.1.1. Communicate AI project outcomes using language that is appropriate to the target stakeholder
(1¼RI OI] %- TVSNIGX QIXVMGW ERH EGGITXEFPI XLVIWLSPHW
%PMKR I\TIGXEXMSRW [MXL XLI SVKERM^EXMSRW...W WXVEXIKM
)WXEFPMWL TVSGIWWIW WYGL EW WYVZI]W ERH JSGYW KVSYT feedback
3TIVEXMSREPM^I VIUYMVIQIRXW YWMRK XSSPW WYGL EW 5YEP
2.2.2. Implement a project status tracking system
(IZIPST HEWLFSEVHW JSV /4- EREP]WMW
2.2.2.2. Maintain project and sprint backlog
2.2.3. 1EREKI GVMWW L]TI ERH RSMWI EVSYRH XLI %- TVSNIGX
4VITEVI QYPXM WXEOILSPHIV TVSEGXMZI TVSNIGX GSQQYRMG
2.2.3.2. Identify potential risks related to miscommunication
Deliver AI solutions
2.3.1. 3VKERM^I TVSNIGX EWWIXW JSV HIPMZIV] WYGL EW GSHI ERH HSG
&YMPH GSHI VITSWMXSVMIW WYGL EW MR +MXPEF ERH +MX,YF
4VITEVI ORS[PIHKI QEREKIQIRX TPEXJSVQW WYGL EW 'SR½YIR
2.3.2. Establish DevOps foundation for AI project lifecycle

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, Y Q E R (S Q E M R



4.2.1.4 Score how each user felt about the prototype
4.2.1.5 Implement mechanisms to report feedback anonymously to offer testers protections in sensitive use-case violations
4.2.2 Assess the proposed prototype
-HIRXMJ] GSRWXVEMRXW ERH ½E[W FEWIH SR XIWX VIWYXPXW W SV VI¼RIH
-HIRXMJ] RSZIP ERH GSRZIRMIRX JIEXYVIW WYGL EW [LEX [SVO 9THEXI XLI TVSXSX]TIW FEWIH SR JIIHFEGO WYGL EW F] YWMRK WY¼GMIRX VI¼RIQIRX MW EGLMIZIH
+VSYT JIIHFEGO MRXS WSGMSPSKMGEP WYGL EW GYPXYVI LM GSRWMHIVEXMSRW WYGL EW WXVIRKXL SJ TVMZEG] XLVSYKL XLI ZE ETTSTVMEXIRIWW SJ XLI JEMVRIWW QIXVMGW IUYEPM^IH SHHW VINI
4.2.2.5. Prioritize sociological and technical considerations to address according to project budget
-HIRXMJ] VIH PMRIW RS KS ^SRIW [LMGL EVI HIXIVQMRIH XS FI EVI WLS[WXSTTIVW WYGL EW XLI YWI SJ JEGMEP VIGSKRMXMSR MR T

Communication	
Develop a communication strategy for the AI project team	
1.1.1 Investigate the AI team project context	
4VSHYGI PMWX SJ EPP WXEILSPHIVW XLEX [MPP GSPPEFSVEXI HIZIPSTIV HEXE IRKMRIIV HEXE WGMIRXMXW WGVYQ QEWXIV TVSNI	
(I¼RI PMWX SJ IITIGXIH HIPMZIVEFPIW JSV IEGL WXEILSPHIV EVGLMXIGXYVI HIWGVMTXMSR EGXMZMXMIW VSEHQET GSHI HSGYQI	
(I¼RI PMWX SJ HIGMMSRW XLEX RIIH XS FI GSQQYRMGEXIH W EVGLMXIGXYVI TIVJSVQERGI QIXVMGW	
(I¼RI PMWX SJ TSXIRXMEP MWWYIW XLEX [MPP RIIH XS FI GSQQ WYGL EW ERXMGMTXIH HIPE]W XIGLRMGEP HM¼GYPXMIW	
1.1.1.5. Evaluate the list of stakeholders to include a diverse group of internal and external participants that matches the target audience of the project	
1.1.1.6. Evaluate baseline knowledge of selected stakeholders for base issues in ethics considerations WYGL EW TVMZEG] JEMVRIWW XVERWTEVIRG]	
(I¼RI PMWX SJ VIWSYVGIW WYGL EW ZMHISW TETIVW LERHFS WXEILSPHIVW XS ¼PP ORS[PIHKI KETW SR IXLMGW GSRWMHIVEXMSR	
1.1.2 Design the communication strategy	
4VSHYGI E 6IWTSRWMFPI %GGSYRCEFPI 7YTTSVXMRK 'SRWYP] 6IWTSRWMFMPMX] 1EXVM\ YWMRK PMWX SJ HI¼RIH VIWTSRWMFMPMX MWWYIW ERH WXEILSPHIVW	
1.1.2.2 Identify groups involving stakeholders with similar responsibilities	
(I¼RI E WIX SJ XIEQ MRXIVEGXMSRW WYGL EW QIIXMRKW HMW MHIRXM¼IH KVSYTRMKW MR XLI 6%7'- VIWTSRWMFMPMX] QEXVM\	
(I¼RI JVIUYIRG] SJ IEGL XIEQ MRXIVEGXMSR	
0MWX EZEMPEFPI GSQQYRMGEXMSR QIXLSHW WYGL EW TLSRI MR TIVWSR QIIXMRKW	
(I¼RI GSQQYRMGEXMSR QIXLSHW JSV IEGL XIEQ MRXIVEGXMSR GLEX SV I QEMP [IIOPI] XIEQ QIIXMRKW YWMRK ZMHISGSRJIVIRGMRK	
1.1.2.7. Identify limitations of technical and cost barriers for having inclusive participation from all stakeholders	
1.1.3 Implement the communication strategy	

7IPIGX XIGLRSPSKMIW XS YWI JSV IEGL GSQQYRMGEXMSR QIXLS . - 6% 'SR½YIRGI
1.1.3.2 Communicate the strategy design and implementation details to all stakeholders before the WXEVX SJ E TVSNIGX WYGL EW XLI VIWTSRWMFMPXMIW QIIXMRK JVS
1.1.3.3. Gather feedback from stakeholders to identify any concerns on communication styles and JVUIUYIRGJ KMZIR GSRWMHIVEXMSRW WYGL XLIMV TIVWSREP GMVGYQ
Apply active listening when engaging users and stakeholders
1.2.1 Engage in the stakeholder communication
9WI RSR ZIVFEP GYIW WYGL EW SGGEWMSREP RSHHMRK IJI GS
%WO WTIGM¼G UYIWXMSRW XS IRWYVI E GSQQSR YRHIVWXERHM
1.2.2 Identify key concepts from the stakeholder message
1.2.2.1 Restate the key ideas of the conversation to validate understanding of what is conveyed
7YQQEVM^I OI] GSRGITXW SJ WXEOILSPHIV QIWWEKI YWMRK W JVII LERH HMEKVEQW GSRGITXYEP QSHIPW YWMRK FS\IW ERH EVVS[V
1.2.3 -RXIVTVIX XLI WXEOILSPHIV...W QIWWEKI
)QTEXLM^I [MXL XLI WTIEOIV...W QIWWEKI
1.2.3.2 Identify the existing cognitive biases and team communication practices for stakeholders WYGL EW TVMQMRK FMEW E¼RMX] FMEW GSR¼VQEXMSR FMEW
1.2.4 React to the stakeholder message
1.2.4.1 Share similar experiences to show understanding of speaker message
%WO STIR IRHIH UYIWXMSRW XS WXMQYPEXI JYVXLIV GSRZIVWE
4VIWIRX HEXE YWMRK WXS\XIPP MRK XIGLRMUYIW
Prepare the narrative
(SGYQIRX XLI MRXMEP FYWMRIWW TVSFPIQ ERH FEGOKVSYRH V ERXMGMTXIH FYWMRIWW ZEPYI HIVMZIH JVSQ MRWMKLXW SFXEMRIH
(IXIVQMRI]SYV EYHMIRGI X]TI WYGL EW XIGLRMGEP FYWMRIW XLI SVKERMWEXMSR
4VIHMGX T`°İWYG ñ“Đ@`IW epĐ

K %ĐP p P `@€•đ @ 0Đ@P€•€@`•@•Å4VIW epĐ

'LEPPIRKI XLI FEWMW JSV GLSSWMRK XLI TVMQEV] KSEP JSV TY EWOMRK MW MX VSSXIH MR E TEWWMSR SV KIRYMRI MRXIVIWX XS PIE E WYTIV¼GMEP GYVMSYWMX] FIGEYWI MX MW TSTYPEV
0MWX WYFNIGXW EVIEW ERH WOMPPW XLEX]JSY EVI TEVXMGYPE MR WYGL EW GSQTYXIV ZMWMSR EYXSRSQSYW ZILMGPIW VSF SXMG EGGSYR XEFMPMX] KSZIVRERGI
0MWX VIUYMVIH WYFNIGX EVIEW ERH WOMPPW XS PIEVR FEWIH WYGL EW GSRWYPXMRK E HSQEMR I\TIVX GEVIIV EHZMWSV NSF HIW
4VSHYGI E ¼REP PMWX SJ WYFNIGX EVIEW ERH WOMPPW XS PIE ERH KSEP VIUYMVIQIRXW
6IZMI[XLI GSQTMPIH PMWX [MXL WSGMEP WGMIRGIW ERH XIGLFR
1.1.2 7IPIGX VIUYMVIH PIEVRMRK EGXMZMXIW XS TYVWYI JSV PMJIPSRK
0MWX PIEVRMRK VIWSYVGIW XLEX WYTTSVX IHYGEXMSR JSV XL WYGL EW SRPMRI PIEVRMRK [IFWMXIW GSRJIVIRGIW TVSJIW WMSREP TVSJIW WMSREP GIVXM¼GEXMSRW
-HIRXMJ] WTIGM¼G PIEVRMRK EGXMZMXMIW F] GSRWYPXMRK P VIKMWXIVMRK XS E WIVMIW SJ [IFMRE VW SV WTIGM¼G GSYVWIW SR E
'PEWWMJ] XLI MHIRXM¼IH PIEVRMRK EGXMZMXMIW EW IMXLIV W GPEWWIW GSRJIVIRGIW SV WIPJ TEGIH ER][LIVI ER]XMQI WYGL EW
4VSHYGI E GEPIRHEV SJ PIEVRMRK EGXMZMXMIW PMJIPSRK PI WIPJ TEGIH EGXMZMXMIW XS TYVWYI MR E WTIGM¼G XMQI JVEQI WY XS HIHMGEXI XS PIEVRMRK SZIV XLI RI X]IEV
1.1.2.5 Determine your level of time commitment to learning
1.1.2.6. Determine case studies for ethical considerations to gain hands-on experience with applying GSRGITXW WYGL EW TVMZEG] FMEW XVERWTEVIRG] EGGSYR XEFMP
Implement the lifelong learning plan
1.2.1 Perform self-paced learning activities
*SPPS[XLI PEXIWX HIZIPSTQIRXW F] VEHMNRK [IIFKEVXMM SRHW FMEWIW TETIVW [MXL GSHI
1.2.1.2 Complete self-paced online learning activities as per established calendar WYGL EW SR (EXE'EQT 4PYVEP7MKLX /EXE'SHE 'SYVWIVE IH\ SVK ;EXGL ZMHIS VIZMI[W JVSQ I\TIVXW MR XLI ¼IPH SJ %- WYGL E
'SPPEFSVEXI SR STIR TVSNIGXW WYGL EW MR QEGLMRI PIEVRM WYGL EW F] YWMRK STIR WSYVGI TVSNIGXW SR +MX,YF
1.2.2 Perform scheduled learning activities
4EVXMGMT EXI EX WGLIHYPH KVSYT QIIXYTW WYGL EW MR %- G
4EVXMGMT EXI MR [IFMRE VW ERH [IFGEWXW WYGL EW /H2YKKIX
%XXIRH GSRJIVIRGIW WYGL EW 3TIR (EXE 7GMIRGI 'SRJIVIRGI ;SVPH 7YQQMX %- 2IYV-47
1.2.2.4 Enrol in a formal education program in AI
1.2.2.5 Present at conferences or to communities of practice
1.2.2.6. Participate in online communities that are centered on ethical considerations of AI WYGL EW 1(7+ 1SRXVIEP %-)XLMGW -RWXMXYXI

Goal Setting
2.1 (I¼RI XLI FYWMRIWW SFNIGXMZI JSV XLI %- TVSNIGX
2.1.1 Formulate the business objective

*SVQYPEXI E FYWMRIWW ZEPYI TVSTSWMXMSR XLEX XLI %- TVSI RYQFIV SJ HMWIEWIH XVIIW XLEX LEZI XS FI GYX HS[R SR ER EERRYEP
2.1.1.2 Reframe the value proposition as a business objective that can be realised by an AI project WYGL EW HITPS]MRK E TVIHMGXMZI QSHIP XLEX HIXIGXW HMWIEWIH .
6I¼RI XLI WXEXIQIRX XS GSRZI] ER MRWTMVEXMSREP XSRI XLE>
)\TVIWW XLI FYWMRIWW SFNIGXMZI WXEXIQIRX UYEPMXEXMZIP] ERH RSX TVIGMWI RYQFIVW SV UYERXMXMIW
7IX E WTIGM¼G XMQI JVEQI JSV EGLMIZMRK XLI FYWMRIWW SFN TVIHMGXMZI QSHIP XLEX HIXIGXW HMWIEWIH XVIIW YWMRK ZMHIS GEO XLEX GSZIV XLI IRXMVI GMX] SR E HEMP] FEWW F] IRH SJ XLI XLMVH
(I¼RI XLI WSGMIXEP I\XIVREPMXMIW JSV IXLMGEP GSRWMHIVEX that may arise from trying to achieve the business objective
2.1.2 :EPMHEXI XLI FYWMRIWW SFNIGXMZI
:IVMJ] XLEX XLI SFNIGXMZI TVSZMHIW FYWMRIWW ZEPYI JSV WX HIXIGXMRK HMWIEWIH XVIIW XLI FYVHIR SR MRWTIGXS VW MW PMKLI HEMP]
:IVMJ] XLEX XLI SFNIGXMZI MW JIEWMFPI VIEPMWXMG ERH EX GER FI VIEGLIH [MXLMR E WTIGM¼G XMQI JVEQI
:IVMJ] XLEX XLI SFNIGXMZI MW GSRXVSPPEFPI F] XLI XIEQ WY I\IGYXI XLI OI] EGXMZMXMIW VIUYMVIH XS EGLMIZI XLI SFNIGXMZI
:IVMJ] XLEX XLI WXEXIQIRX MW I\TVIWWIH UYEPMXEXMZIP]
:IVMJ] E GSRXMKIRG] TPER MR GEWI XLI W]WXIQ RIIHW XS FI X such a takedown on critical services for vulnerable people
(I¼RI XLI I\TIGXIH OI] VIWYPXW JSV EGLMIZMRK XLI FYWMRIWW SFNIG
2.2.1 Formulate the expected key results that will ascertain the business objective has been met
(I¼RI E PMWX SJ TSXIRXMPE OI] VIWYPX WXEXIQIRXW YWMRK T GER FI IZEPYEXIH WYGL EW ER MRJIVIRGI PEXIRG] SJ PIWW XLER X[S JSSXTVMRX ¼XW SR E QSFMPI TLSRI
(I¼RI E PMWX SJ TSXIRXMPE OI] VIWYPX WXEXIQIRXW YWMRK U GER FI IZEPYEXIH WYGL EW F] HIXIVQMRMRK EGGYVEG] YWMRK QIER

<p>:IVMJ] XLEX OI] VIWYPXW HIWGVMI SYXGSQIW ERH RSX EGXMZ SJ XEWOW FYX GSRZI]MRK E GSRGVIXI WYFWXERXMED ERH QIEWYVE</p>	
<p>:IVMJ] XLEX OI] VIWYPX WEXEQIRXW EVI HIQSRWXVEXEFP MR X TSWWMFMPMX] XS UYERXMJ] TVSKVIWW [MXL ER EGGYVEG] VEXI QIEV</p>	
2.2.2.4 Assign an owner for the key result statements	
Monitor the progress of the business objective using key results	
2.3.1 Assess progress during check-ins	
<p>%WWIWW XLI GSR¼HIRGI PIZIP JSV GSQTPIXMRK IEGL OI] VIWYP WYGL EW ! YRPMOIP] ! LMKL VMWO SJ JEMPYVI ! HM UYMGOP] ! SR XVEGO</p>	
<p>(I¼RI E PMWX SJ TVMSVMX] EGXMZMXMIW XS JSGYW SR JSV WYI ERRSXEXIH MQEKIW YTKVEHMRK WIVZIV LEVH[EVI</p>	
'SQQYRMGEXI TVMSVMXM^IH EGXMZMXIW JSV WYFWIUYIRX XEWO	
<p>(I¼RI E QIXLSH SJ MRGSVTSVEXMRK JIIHFEGO JVSQ WXEOILSPH GSRWMHIVEXMSRW WYGL EW XLI IQIVKIRGI SJ RI] GEXIKSVMIW SJ LE F] XLI GSRXIRX QSHIVEXMSR W]WXIQ</p>	
Perform grading of key results to stay on track	
2.3.2.1 Assess the progress of the business objective against each key result statement using	
<p>TVIZMSYWP] EKVIIH YTSR WGSVMRK GVMXIVME WYGL EW ! I\XVIQ ! QIHMSGVI ! JEPPIRK WLSVX ! RS TVSKVIWW</p>	
<p>%WWIWW [LMGL GSQTSRIRXW HIPMZIVEFPIW SV VMWOW QYWX (I¼RI E PMWX SJ TVMSVMX] EGXMZMXMIW XS FI TIVJSVQIH JSV</p>	
1@LpRiC@DVRQpFpV@E@D@E@R@W@S@BMR@NW@Y@V@E@"@XG@%@F@P@Q@S@G@A@D@E	

2 EVVEXMZIW

The goal for this section is to provide users of the AI competency framework with different contexts MR [LMGL XLI MHIRXM¼IH ORS[PIHKI WOMBSP EUGSQR#PEVMIIPM&MWW GGB characters based on interviews have been developed for program developers and educators. -R XLI WEQI [E] XLEX WXYHIRXW EVI HMZIVWI IEGL [MXL XLIMV S[R the context is critical for these narratives.

8LI REVVEXMZIW HIWGVMFI XLI VSPI SJ E TVSKVEQ HIZIPSTIV ERH E ERH E GSRXMRYMRK IHYGEXMSR 'SRGSVHME 'SRXMRYMRK)HYGEXM VIPIZERX ETTPMGEXMSRW SJ XLI GSQTIXIRG] JVEQI[SVO EVI MHIRXM developer and educator responsibilities. This is useful to direct users of this document working in similar contexts to different applications of the framework for their own roles.

4 VSKVEQ (IZIPSTIV

>SI PIEHW TVSKVEQ HIZIPSTQIRX EW ER MRWXVYGXMSREP HIWMKRI 8LI] HIZIPST ERH YTHEXI TVSKVEQW MR %- EX XLI GSRXMRYMRK IHY

)HYGEXSV

.YPMIR MW ER I\TIVMIRGIH IHYGEXSV [LS XIEGLIW ERH HIZIPSTW GS continuing education levels in Montreal. Julien interacts directly with their students and attempts to translate complex concepts inherent in AI into easy-to-understand content for a diverse group.

.YPMIR EHLIVIW XS XIEGLMRK WTIGM¼G GSYVWI PIZIP PIEVRMRK SY YWIW XLIWI XS GVIEXI VIPIZERX PIEVRMRK EGXMZMXMIW %HHMXMS GSQTIXIRGMIW ERH PIEVRMRK SYXGSQIW F] GVIEXMRK E WTIGM¼G V in additional research on content and teaching strategies to curate content for students after YRHIVWXERHMRK XLI WXYHIRX RIIHW -R ~~GESR WMRLYMRKVIFYZERXMRH~~ experience to the classroom and even coaches students on approaching the job market and connecting students to industry.

%PXL SYKL .YPMIR EHLIVIW XS E GYVVMGYPYQ XLI] ¼RH GVIEXMZI [[LIR WXYHIRXW EVVMZI XS [LEX XLI] QYWX FI EFPI XS HS [LIR XLI] P QMKLX FIKMR [MXL IWXEFPMWLIH GSYVWI SYXPMRIW ~~GSQTIXIRGMIW~~ VIUYMVIH XS XVERWJSVQ XLSWI MRXS E PIEVRMRK I\TIVMIRGI JSV V

Julien also takes on additional responsibility by developing courses in AI and emerging technologies.

;LIR .YPMIR HIZIPSTW GSYVWIW XLI] EVI VIWTSRWMFPI JSV

- y Understanding the goal of the course meaning what we ultimately want to accomplish
- y Developing course learning outcomes
- y

'SQTIXIRG] *VEQI[SVO

8LI %- GSQTIXIRG] JVEQI[SVO MW E GSQQSR WIX SJ GSVI GSQTIXIRG]
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FIGEYWI XLI JVEQI[SVO GSZIVW EPP SJ XLI GSVI GSQTIXIRGMIW ER
select the competencies that are relevant to their context and that respect their constraints including
XMQI FYHKIX ERH MRWXMXYXMSREP TVSGIWWIW XS ETPP] MR XLI
,IVI EVI X[S EVIEW MR .YPMIR...W VSPI EW ER IHYGEXSV [LIVI XLI %-
meaningfully contribute:

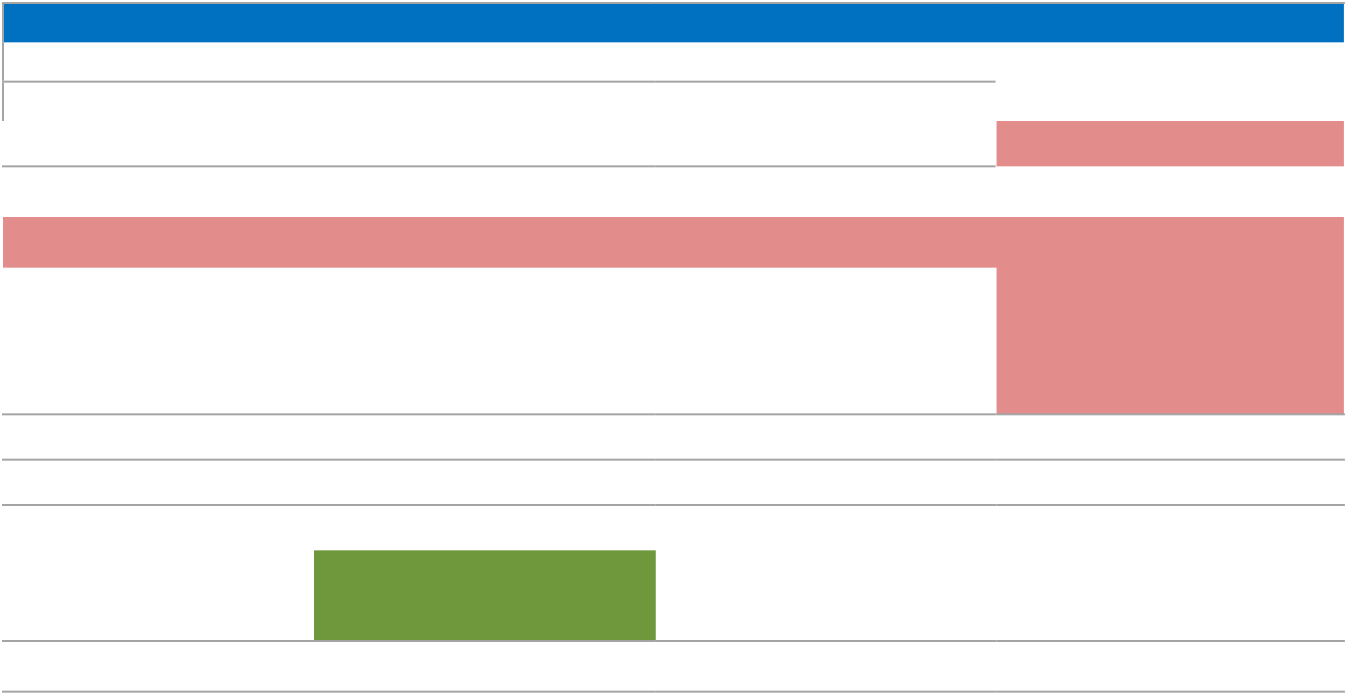
1. Creating learning activities for students
 - y In practical terms this involves combining several sub-competencies and sub-sub competencies from the framework to help develop an activity
2. Developing assessments based on course learning outcomes and competencies

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EX XLI GSPPIKI PIZIP MW XS ¼RH [E]W XS WGEPI %- SJJIVMRKW ERH
XLMW (E[WSR 'SPPIKI MW EGXMZIP] FYMPHMRK GETEGMX] XS WYTT
in curricula. The goal is to expose as many students as possible to AI concepts through both general
IHYGEXMSR ERH MR GSYVWIW EGVSWW XLI WGMIRGIW XLI WSGMEP
-R XLI WTIGM¼G GEWI SJ XLI '^+)4 PIZIP 7GMIRGI 4VSKVEQ WSQI %
EPVIEH] TVIWIRX MR XLI GYVVMGYPYQ RSXEFP] XLI QENSVMX] SJ X
EVIE 1SVISZIV SXLIV GSQTIXIRGMIW EVI IEWMP] MRXIKVEXIH EW P
JSVQEP TVSKVEQ VIZMWMSR XS MQTPIQIRX *SV KIRIVEP IHYGEXMS
I\TPSVEXMSR MR XLI LYQERMXMIW ERH MW ER ETTIEPMRK WYFNIGX
JSV E ½I\MFPI QYPXMHMWGMTMPREV] ETTVSEGL XS %- XLIQIW

Below is a sketch of how technical competencies from the framework could be integrated into
XLI GYVVIRX 4YVI %TTPMIH 7GMIRGI TVS¼PI EX (E[WSR 'SPPIKI [M
1EXLIQEXMGW 7XEXMWXMGW GSQTIXIRGMIW ERH E TVSNIGX FEWI
the technical details needed for working with data and building models.



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addresses considerations for other users of the competency framework to take into account when implementing your use case.

Program administrators of AI courses and programs

- y Identify growth opportunities such as new programs and courses
- y Evaluate the relevance of current programs and offerings

Student success centers looking at developing complimentary trainings for technical or non-technical students

- y Provide students with career counselling:
 - à Support students in selecting the appropriate degree that meets their goals
 - à Assist students in developing an education plan
 - à 7YTTSVX WXYHIRXW MR I\TPSVMRK XLIMV WXVIRKXLW MRX
- y Provide students with career advising:
 - à Assist with resume writing
 - à Help students prepare for interviews
- y Develop resources for students to explore career pathways
- y Develop career development workshops to introduce AI pathways

Training managers and human resource managers

- y Identify knowledge and skills gaps in current organizations to develop training programs for internal employees or create recruitment strategies for internal and external hiring
- y Identify goals and formal and informal experiences for career development planning

y Baseline main and supporting objectives for performance planning

y -HIRXMJ] XLI WOMPPW ORS[PIHKI I\TIVMIRGI ERH EXXMYI

Prior learning coordinators

y Use the framework as a baseline to validate and certify competencies

y -HIRXMJ] XLI GSQTIXIRGMIW VIUYMVIH JSV E WTIGM¼G ¼IPH
previous experience and knowledge

y Use it as a reference document for competencies that a candidate should master

Concordia University and Dawson College leveraged the opportunity to collaborate on this project as
E [E] XS GSRXMRYI SYV [SVO MR EPMKRMK %- VIPEXIH XIEGLMRK E
ORS[PIHKI ERH EFMPMXMIW WXYHIRXW EVI I\TIGXIH XS TSWWIWW E
This AI competency framework also supports a success pipeline for learners from college to university
XS PMJI PSRK PIEVRMRK [LS EVI EPP EX HMJJIVIRX WXEKIW MR XLIM
address the evolving AI talent needs and serves as a base for curriculum development to balance
XIGLRMGEP FYWMRIWW LYQER ERH IXLMGEP GSQTIXIRGMIW MR %
of prior learning.

;I RIIH XS GSRXMRYI XS FVIEO HS[R XLI WMPSW MR XLI [E] [I GSRGI
NYWX EFSYX HIZIPSTM RK XIGLRMGEP GSQTIXIRGMIW FYX VIUYMVIW
human skills along with ethical skills.

8LI GLEPPIRKI ELIEH MW XS QSZI FI]SRH WMQTP] GVIEXMRK XLMW G
the core competencies AI practitioners should possess in a Montreal context to understanding and
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where builds and tests then run. Automated tools are used to assert the new
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machine learning algorithms to analyze and cluster unlabeled datasets. These
algorithms discover hidden patterns or data groupings without the need for human
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Adopted at 175 universities <https://github.com/d2l-ai/d2l-en>

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