



# Personal Career Manager Software Agent Chatbot

## Project Report

Team Name: Team10

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NUS-ISS Master of Technology in Intelligent Systems

ISY5001 Cognitive System

## **1. Executive Summary**

The team has successfully implemented a Personal Career Manager Software Agent which is deployable on Facebook Messenger platform. The Software Agent can help professionals develop a personalised career roadmap as well as recommending suitable jobs and training opportunities. It is also able to answer questions regarding jobs available in the market. The Software Agent takes a persona-based approach in its interaction with its users. A context management approach has been implemented to allow the Software Agent to hold the context of the conversation from start to end and to allow flexibility for the user to branch away from the predefined conversation flow.

## **2. Project Scope**

### **a. Opportunity Statement**

According to a McKinsey&Company Report<sup>1</sup>, it was estimated that globally between 400 million and 800 million individuals could be displaced by automation and need to find new jobs by 2030. And according to a separate LinkedIn Report<sup>2</sup>, by 2020, it is expected that 42 percent of the core skills required for a job will change.

This makes it timely to empower individual with a Personal Career Manager Software Agent which will help with managing their career by recommending training courses to acquire market demanded competency and to constantly look out for better job opportunities.

### **b. Value Proposition**

The Personal Career Manager Software Agent provides personalised career management and answers questions regarding jobs available in the market. When deployed live, it is accessible 24/7 and it constantly works in the background to help clients look out for high relevancy training courses and better job opportunities. The conversational user interface provides a personified representation of a human career manager which makes it more natural for the user to interact with.

### **c. Capabilities**

The Personal Career Manager has the below capabilities:

- i. Answers queries on jobs available in the market
- ii. Elicit user employment details
- iii. Elicit career preferences
- iv. Determine career aspiration
- v. Develop personalised career road map
- vi. Elicit user competency
- vii. Recommend training courses

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<sup>1</sup> Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation December 2017, McKinsey Global Institute

<sup>2</sup> Future of Skills 2019: Anticipating what's next for your business, LinkedIn Talent Solutions

- viii. Recommend jobs
- ix. Answers FAQ on the services provided
- x. Sign up new clients

### 3. Solution Design

#### a. Goal of Software Agent

The software agent is designed with two end goals. The first goal is to guide the user to develop a personalised career roadmap while recommending jobs and courses that are relevant for his current or future jobs in the roadmap. The second goal is to encourage the user to sign up an account so that the software agent can follow up on new job and training opportunities.

#### b. Persona-Based Approach

A persona-based approach has been taken to better address individual latent needs. The below 5 personas has been identified. Users will be categorised into a persona type based on the statements or questions they posted.

Persona Type	Profile Description	Latent Needs
Jaded Employee	In mid-thirties, has been working for 5 to 8 years in the same company and does not feel appreciated by his boss. Has been passed for promotion in the recent 1 to 2 years.	A career road map that can guide him on how to progress in this career and a new job that can set him up in the right career path.
Unemployed Job Seeker	Have been looking for job for the past 3 to 6 months to no avail. Becoming increasingly disappointed as the day goes by without receiving job offers.	Urgently needs to find a job.
Eager Learner	In mid-twenties, has been working for 4 to 5 years. Enjoys learning new things and has completed several online courses.	Suitable training courses to upgrade himself.
Go Getter	Driven and ambitious young working professional. Has a clear career goal and regularly performs self-reflection on his work performance.	A career road map that can guide him on how to reach his career goals.
Curious Explorer	Generally happy with his career. Just looking around to explore the services that the software agent can provide.	Interested to see the available training courses and job opportunities.

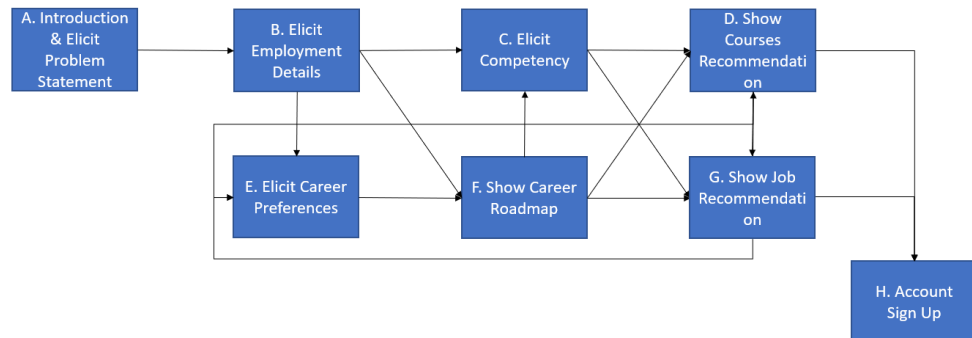
### c. Engagement Tactics

The following engagement tactics were implemented to maximise the success rate of the software agent achieving its goals.

- i. **Lead the conversation** – The software agent will lead the conversation by asking appropriate follow up questions based on the context of the conversation.
- ii. **Give users (a bit of) what they want first** – if user do not get what they want fast enough, they may not have the patience to continue the conversation. The user needs will be based on their identified persona type and will be addressed first before the software agent leads the conversation to other areas.
- iii. **Show empathy** – it is expected that some of the users are currently having some frustration in their career. Where applicable, empathetic tones will be used to make the user feel better.

### d. Conversation flows

Pre-defined conversation flows have been designed for each persona type to sequence addressing their needs from most pressing to least pressing.



Conversation flow for each persona type:

<b>Jaded Employee</b>	A	>	B	>	E	>	F	>	C	>	G	>	D	>	H
<b>Unemployed Job Seeker</b>	A	>	B	>	C	>	G	>	E	>	F	>	D	>	H
<b>Eager Learner</b>	A	>	B	>	C	>	D	>	E	>	F	>	G	>	H
<b>Go Getter</b>	A	>	B	>	F	>	C	>	G	>	D	>	H	>	
<b>Curious Explorer</b>	A	>	B	>	E	>	F	>	C	>	D	>	G	>	H

### e. Context Management

The context of the conversation is managed by differentiating global context and local context. Global context is defined as the overall context of the conversation and the context is maintained by using data variables in the backend system. Local context is defined as context in the recent interaction (e.g. would you like to find out more? Answer can be yes or no). Local context is implemented using DialogFlow's built-in

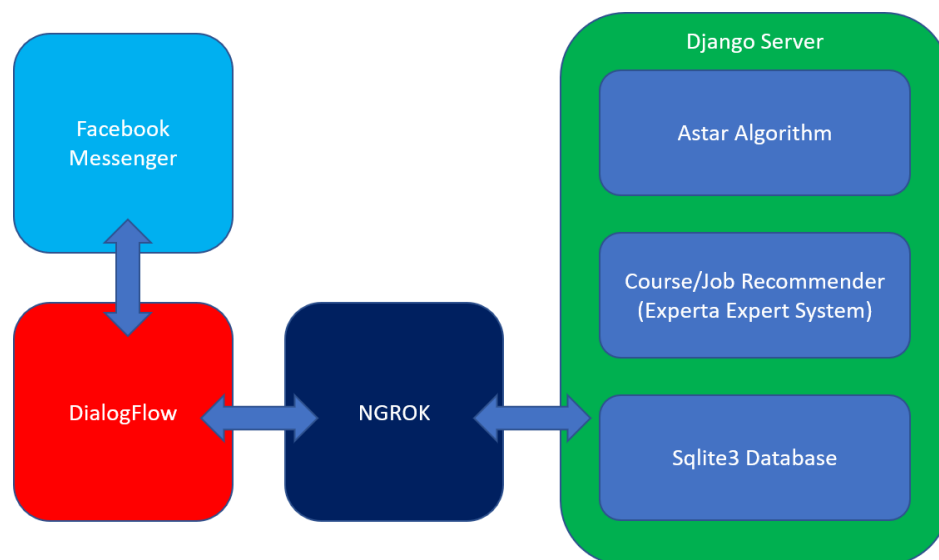
follow up intents. Such a structure has given the flexibility for the user to branch out of any pre-defined conversation flow and continue interacting with the Software Agent.

**f. Robustness**

- i. **Synonym for Entity** – Synonyms are defined to handle acronym and the different terms used to refer to a job title.
- ii. **Required Entities** – Required Entities feature in Dialogflow is utilised to prompt users for missing entity inputs.
- iii. **Persistent Entities** – In case of network timeouts, we have created persistent storage for entity values within our database to prevent the conversation flow from breaking.

**4. System Architecture**

The overall system architecture includes a Django server backend consisting of a Sqlite 3 database (Course, Job, Career data, etc), a Courses and Job Recommender and a search module (Astar search) for searching career paths<sup>3</sup>. All intent's fulfilments are managed by the Django server, webhook connection between Dialogflow and the Django server is handled by tunnelling with ngrok. Lastly, Dialogflow is integrated with Facebook messenger for the front end.



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<sup>3</sup> The Courses and Job Recommender and the search module (Astar search) for searching career paths is developed for the IRS MS-RS project.

## 5. Data Source

Data was sourced from the public websites and was pre-processed before being stored in the database.<sup>4</sup>

- i. **Data Transformation** - Curriculum Vitae and course data obtained from the public website were unstructured and had to be transformed to fit into a structured format before being stored in the system.
- ii. **Data Selection** - Low frequency words were removed from the job description data while high frequency words were filtered against an IT bag of words to select only related words for job competencies.

## 6. Conclusion

The team has overcome a few technical challenges to successfully delivered the agreed scope of the project and has gained much experience and confidence in implementing a chatbot application. User testing was carried out with a few classmates and the feedbacks were generally positive. Below are a listing of the limitations and future enhancements.

### Limitations

- i. Given limited time and resources, the current dataset only contains traditional Information Technology jobs

### Future Enhancements

- i. Expand the dataset to cover jobs in all major industries
- ii. Enhance user interface with buttons for yes/no questions

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<sup>4</sup> Refer to Annex D for full list of career positions available

## Annex A – Dialogflow Intents

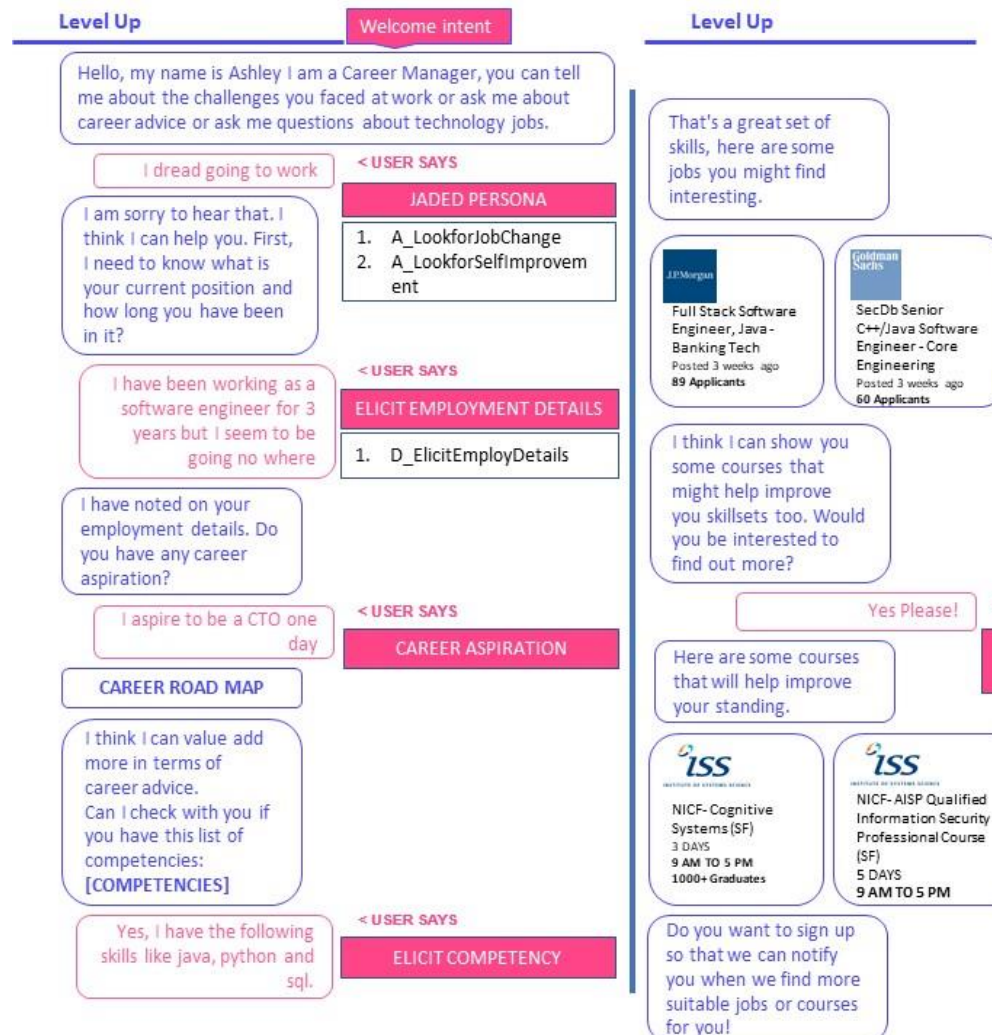
S/N	Intent Name	Intent Description
1	A_GetCareerRoadMapInfo	Ask for information on what is a career road map and how is it generated
2	A_GetHighestDemandJob	Ask for information on what is currently the most highly demanded job
3	A_GetJobCompetency	Ask for information on competencies required for a specific job
4	A_GetJobDifference	Ask for information on the difference between 2 different jobs
5	A_GetJobEducation	Ask for information on the required education level for a specific job
6	A_GetJobPath	Ask for information on a career path given a specific career end goal
7	A_GetJobSalary	Ask for information on salary amount for a specific job
8	A_GetJobScope	Ask for information on job description for a specific job
9	A_GetJobYears	Ask for information on the minimum number of years of experience for a specific job
10	A_GetServiceInfo	Ask for information on what services the Personal Career Manager Software Agent offers
11	A_LookforCareerPath	Look for Career Path
12	A_LookforJob	Look for Job
13	A_LookforJobChange	Look for Change in Job
14	A_LookforSelfImprovement	Look for Training Courses
15	D_ElicitEmployDetails	Captures the user's response on job details in various Persona and to lead them on towards their respective paths
16	D_GetAspiration	We use this intent to capture user's Aspiration to act as a goal for our A*Search algorithm in finding the user's career roadmap
17	K_GetCareerPref	Should the user has no current Aspiration, we ask the user about his preference on job type he prefers to work on to suggest the user's career roadmap
18	Wang_elicit_comp	This intent captures the competencies of the users to help in providing relevant jobs and course recommendations based on their current skill set and missing skills to fulfil their career roadmap
19	K_signup	Captures user's intent to signup and get their full name and email address for our response

## Annex B – Utility Functions

S/N	Function Name	Function Description
1	getJobCompetency(jobtitle)	Query database and return list of competencies required for input job title
2	getHighestDemandJob()	Query database and return the job title with the highest count
3	getJobEducationLevel(jobtitle)	Query database and return the minimum education level for input job title
4	getJobSalary(jobtitle)	Query database and return the salary range for the input job title
5	getJobDescription(jobtitle)	Query database and return the job description for the input job title
6	getJobMinYearsExperience(jobtitle)	Query database and return the average minimum working years required to achieve the level for input job title
7	getCareerPath(currentjobtitle, aspiredjobtitle)	Perform an Astar search across a knowledge graph of career position and their next available career progression position until the aspired career position is reached. Returns a list of all career positions between input current job title and aspired job title.
8	elicit_competence_with_endgoal(currentjobtitle, aspiredjobtitle)	Query database and return a list of competencies for the input aspired job title which are not included in the list of competencies for the input current job title.
9	elicit_competence_without_endgoal(currentjobtitle)	Query database and return a list of competencies for all next immediate career position for input job title which are not included in the list of competencies for the input job title.
10	jobsrecommendation_with_endgoal(currentjobtitle, aspiredjobtitle, userCompetence)	Query database and return a list of recommended jobs for their next available career progression position which required skillset from the list of user competencies.
11	Jobrecommendation_without_endgoal(currentjobtitle, userCompetence)	Query database and return a list of recommended jobs for all next available career progression position which required skillset from the list of user competencies.
12	courserecommendation_with_endgoal(currentjobtitle, aspiredjobtitle, userCompetence)	Query database and return a list of recommended courses for their next available career progression position which required skillset from the list of user competencies.
13	courserecommendation_without_endgal(currentjobtitle, userCompetence)	Query database and return a list of recommended courses for all next available career progression position which required skillset from the list of user competencies.



## Annex C – Example Conversations for each Personal Type



## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

I dread going to work

< USER SAYS

JADED PERSONA

1. A\_LookforJobChange
2. A\_LookforSelfimprovement

I am sorry to hear that. I think I can help you. First, I need to know what is your current position and how long you have been in it?

I have been working as a senior project manager for 3 years

< USER SAYS

ELICIT EMPLOYMENT DETAILS

1. D\_ElicitEmployDetails

I have noted on your employment details. Do you have any career aspiration?

No one really.

< USER SAYS

CAREER ASPIRATION (NO)

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I enjoy managing a team.

< USER SAYS

CAREER PREFERENCE

I will suggest you gunning for the Managing Director. Sounds good?

## Level Up

Yes, sounds good

< USER SAYS

CAREER PREF - YES

Great to hear that.

CAREER ROAD MAP

Based on the role, do you have the following competencies today? [COMPETENCIES]

Yes, I know C, .net, Scrum and R..

< USER SAYS

ELICIT COMPETENCY

That's a great set of skills, here are some jobs you might find interesting.

 Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants

 SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

I think I can show you some courses that might help improve your skillsets too. Would you be interested to find out more?

Yes Please!

< USER SAYS

ELICITY COMPETENCY - FOLLOW UP (YES)

## THE JADED EMPLOYEE - CA (NO)

Here are some courses that will help improve your standing.

 NICF- Cognitive Systems (SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

 NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Do you want to sign up so that we can notify you when we find more suitable jobs or courses for you!

Yes.

< USER SAYS

ELICITY COMPETENCY - FOLLOW UP (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.

## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

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JADED PERSONA

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< USER SAYS

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I have noted on your employment details. Do you have any career aspiration?

No one really.

< USER SAYS

CAREER ASPIRATION (NO)

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I enjoy managing a team.

< USER SAYS

CAREER PREFERENCE

I will suggest you gunning for the Managing Director. Sounds good?

## Level Up

Not really

< USER SAYS

CAREER PREF - NO

I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies?  
[COMPETENCIES]

Yes, I have the following skills like java, python and sql.

< USER SAYS

ELICIT COMPETENCY

That's a great set of skills, here are some jobs you might find interesting.

  
Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants

  
SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

I think I can show you some courses that might help improve you skillsets too. Would you be interested to find out more?

< USER SAYS

ELICIT COMPETENCY - FOLLOW UP (YES)

Yes Please!

## THE JADED EMPLOYEE – CA (NO)

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1000+ Graduates

  
NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Do you want to sign up so that we can notify you when we find more suitable jobs or courses for you!

Yes.

< USER SAYS

ELICIT COMPETENCY - FOLLOW UP (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.



## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

What kind of services do you provide?

< USER SAYS

CURIOUS EXPLORER PERSONA

1. A\_GetServicesInfo (GSI)
2. A\_GSI\_YES/NO
3. A\_LookforCareerPath

I can help you develop a personalised career road map and help you look for suitable jobs and training courses. Would you like to give it a go?

Yes, sure.

< USER SAYS

GET SERVICES (YES)

Great! First, I need to know what is your current position and how long you have been in it?

I am a software engineer and have been at it for 2 years

< USER SAYS

ELICIT EMPLOYMENT DETAILS

1. D\_ElicitEmployDetails

I have noted on your employment details. Do you have any career aspiration?

I wish to become a technical lead

< USER SAYS

CAREER ASPIRATION (YES)

CAREER ROAD MAP

I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies: [COMPETENCIES]

## Level Up

Yes, I know about microservices.

< USER SAYS

ELICIT COMPETENCY

That's some awesome skills you have, here are some courses that might be interesting for you.

**ISS**  
INSTITUTE OF SYSTEMS SCIENCE  
NICF- Cognitive Systems (SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

**ISS**  
INSTITUTE OF SYSTEMS SCIENCE  
NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

I think there are some jobs waiting for talented people like you. Would you be interested to find out more?

Yes sure.

< USER SAYS

ELICIT COMPETENCY – FOLLOW UP (YES)

Here are some jobs you might find interesting:

**JPMorgan**  
Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants

**Goldman Sachs**  
SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

Would you be interested to sign up and keep in touch when we get more information?

## THE CURIOUS EXPLORER – CA (YES)

Yes.

< USER SAYS

ELICIT COMPETENCY – FOLLOW UP (NO)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.

## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

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Yes, sure.

< USER SAYS

GET SERVICES (YES)

Great! First, I need to know what is your current position and how long you have been in it?

I am a software engineer and have been at it for 2 years

< USER SAYS

ELICIT EMPLOYMENT DETAILS

1. D\_ElicitEmployDetails

I have noted on your employment details. Do you have any career aspiration?

No one really.

< USER SAYS

ELICIT-EMPLOYMENT DETAIL - NO

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I love to sell concepts and present ideas.

< USER SAYS

CAREER PREFERENCE

## Level Up

I will recommend to aim for the Sales Director. Do you think that's great?

Yes, that's great

< USER SAYS

CAREER PREF - YES

Great to hear that.

CAREER ROAD MAP

Based on the role, do you have the following competencies today? [COMPETENCIES]

Yes, I know SAP, System Integration Testing and matters about UI, BI and ETL.

< USER SAYS

ELICIT COMPETENCY

That's some awesome skills you have, here are some courses that might be interesting for you.



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3 DAYS  
9 AM TO 5 PM  
1000+ Graduates



NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

I think there are some jobs waiting for talented people like you. Would you be interested to find out more?

## THE CURIOUS EXPLORER – CA (NO)

Yes sure.

< USER SAYS

ELICITY COMPETENCY – FOLLOW UP (YES)

Here are some jobs you might find interesting:



Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants



SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

Would you be interested to sign up and keep in touch when we get more information?

Yes.

< USER SAYS

ELICITY COMPETENCY – FOLLOW UP (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.

## Level Up

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Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

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< USER SAYS

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2. A\_GSI\_YES/NO
3. A\_LookforCareerPath

I can help you develop a personalised career road map and help you look for suitable jobs and training courses. Would you like to give it a go?

Yes, sure.

< USER SAYS

GET SERVICES (YES)

Great! First, I need to know what is your current position and how long you have been in it?

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No one really.

< USER SAYS

ELICIT-EMPLOYMENT DETAIL - NO

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I love to sell concepts and present ideas.

< USER SAYS

CAREER PREFERENCE

## Level Up

I will recommend to aim for the Sales Director. Do you think that's great?

No, that's not really what I want

< USER SAYS

CAREER PREF - NO

I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies? [COMPETENCIES]

Yes, I know SAP, System Integration Testing and matters about UI, BI and ETL.

< USER SAYS

ELICIT COMPETENCY

That's some awesome skills you have, here are some courses that might be interesting for you.



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NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

I think there are some jobs waiting for talented people like you. Would you be interested to find out more?

## THE CURIOUS EXPLORER – CA (NO)

Yes sure.

< USER SAYS

ELICITY COMPETENCY – FOLLOW UP (YES)

Here are some jobs you might find interesting:

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Full Stack Software Engineer, Java - Banking Tech  
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Posted 3 weeks ago  
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Would you be interested to sign up and keep in touch when we get more information?

Yes.

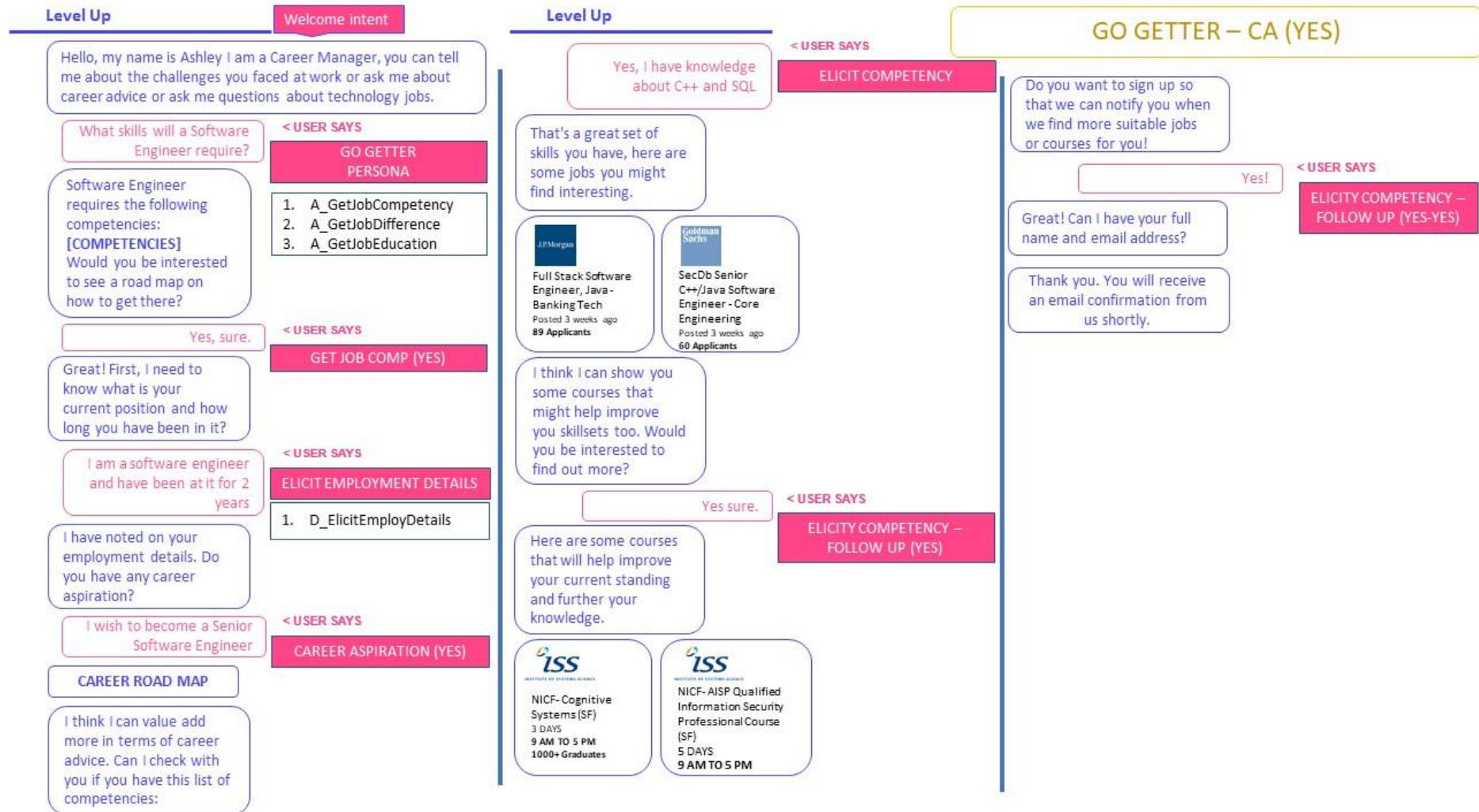
< USER SAYS

ELICITY COMPETENCY – FOLLOW UP (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.





## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

What skills will a Software Engineer require?

< USER SAYS

GO GETTER PERSONA

1. A\_GetJobCompetency
2. A\_GetJobDifference
3. A\_GetJobEducation

Software Engineer requires the following competencies: [COMPETENCIES]. Would you be interested to see a road map on how to get there?

Yes, sure.

< USER SAYS

GET JOB COMP (YES)

Great! First, I need to know what is your current position and how long you have been in it?

I am a software engineer and have been at it for 2 years

< USER SAYS

ELICIT EMPLOYMENT DETAILS

1. D\_ElicitEmployDetails

I have noted on your employment details. If given an opportunity, who do you aspire to be?

No one really.

< USER SAYS

CAREER ASPIRATION (NO)

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I prefer to manage a team.

< USER SAYS

CAREER PREFERENCE

## Level Up

I will suggest you gunning for the Senior Director. Sounds good?

Yes, that is great!

< USER SAYS

CAREER PREFERENCE - YES

Great to hear that.

### CAREER ROAD MAP

Based on the role, do you have the following competencies today? {COMPETENCIES}

Yes I have knowledge about SAP, System integration testing, data migration and data mining

< USER SAYS

ELICIT COMPETENCY

That's a great set of skills, here are some jobs you might find interesting.

**JPMorgan**  
Full Stack Software Engineer, Java - BankingTech  
Posted 3 weeks ago  
89 Applicants

**Goldman Sachs**  
SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

I think I can show you some courses that might help improve your skillsets too. Would you be interested to find out more?

## GO GETTER – CA (NO)

Yes sure.

< USER SAYS

ELICITY COMPETENCY – FOLLOW UP (YES)

Here are some courses that will help improve your current standing and further your knowledge.

**ISS**  
INSTITUTE OF SYSTEMS SCIENCE  
NICF- Cognitive Systems (SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

**ISS**  
INSTITUTE OF SYSTEMS SCIENCE  
NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

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Yes!

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ELICITY COMPETENCY – FOLLOW UP (YES-YES)

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Thank you. You will receive an email confirmation from us shortly.



## Level Up

Welcome intent

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What skills will a Software Engineer require?

< USER SAYS

GO GETTER PERSONA

1. A\_GetJobCompetency
2. A\_GetJobDifference
3. A\_GetJobEducation

Software Engineer requires the following competencies: [COMPETENCIES]. Would you be interested to see a road map on how to get there?

Yes, sure.

< USER SAYS

GET JOB COMP (YES)

Great! First, I need to know what is your current position and how long you have been in it?

I am a software engineer and have been at it for 2 years

< USER SAYS

ELICIT EMPLOYMENT DETAILS

1. D\_ElicitEmployDetails

I have noted on your employment details. If given an opportunity, who do you aspire to be?

No one really.

< USER SAYS

CAREER ASPIRATION (NO)

Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I prefer to manage a team.

< USER SAYS

CAREER PREFERENCE

## Level Up

I will suggest you gunning for the Senior Director. Sounds good?

Not really great

< USER SAYS

CAREER PREFERENCE - YES

I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies? [COMPETENCIES]

Yes, I have knowledge about C++ and SQL

< USER SAYS

ELICIT COMPETENCY

That's a great set of skills, here are some jobs you might find interesting.



Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants



SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

I think I can show you some courses that might help improve your skillsets too. Would you be interested to find out more?

Yes sure.

< USER SAYS

ELICIT COMPETENCY - FOLLOW UP (YES)

## GO GETTER - CA (NO)

Here are some courses that will help improve your current standing and further your knowledge.



NICF- Cognitive Systems (SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates



NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Do you want to sign up so that we can notify you when we find more suitable jobs or courses for you!

Yes!

< USER SAYS

ELICIT COMPETENCY - FOLLOW UP (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.

## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

I cannot get a job

< USER SAYS

UNEMPLOYED JOB SEEKER PERSONA

1. A\_LookforJob

I know, its tough finding a job these days. Let me help you find a suitable job! First, I need to know what was your last position and how long you had been in it?

I use to work as a software engineer for about 3 years.

< USER SAYS

ELICIT EMPLOYMENT DETAILS

I have noted your employment details. I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies: [COMPETENCIES]

I know Node.js and have PMP and IOT knowledge.

< USER SAYS

ELICIT COMPETENCY

1. D\_ElicitEmployDetails

That's a great set of skills, here are some jobs you might find interesting.



Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants



SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

## Level Up

UNEMPLOYED JOB SEEKER – CA (YES)

If given an opportunity, who do you aspire to be?

I will love to be the CTO one day

< USER SAYS

CAREER ASPIRATION (YES)

CAREER ROAD MAP

You can consider some of these courses to achieve your goal!

  
NICF- Cognitive Systems(SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

  
NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Will you be interested to signup with us to learn more?

Yes sure.

< USER SAYS

GETASPIRATION – FOLLOW UP (YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.

## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

I cannot get a job

< USER SAYS

UNEMPLOYED JOB SEEKER PERSONA

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I know, its tough finding a job these days. Let me help you find a suitable job! First, I need to know what was your last position and how long you had been in it?

I use to work as a software engineer for about 3 years.

< USER SAYS

ELICIT EMPLOYMENT DETAILS

I have noted your employment details. I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies: [COMPETENCIES]

I know Node.js and have PMP and IOT knowledge.

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ELICIT COMPETENCY

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1. D\_ElicitEmployDetails



Full Stack Software Engineer, Java - Banking Tech  
Posted 3 weeks ago  
89 Applicants



SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

## Level Up

If given an opportunity, who do you aspire to be?

No one really

< USER SAYS

CAREER ASPIRATION (NO)

That's alright. Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I will want to work in management roles

< USER SAYS

CAREER PREFERENCE

I will suggest you gunning for the Senior Director. Sounds good?

Sounds good!

< USER SAYS

CAREER PREFERENCE - YES

CAREER ROAD MAP

You can consider some of these courses to achieve your goal!



NICF- Cognitive Systems (SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates



NICF- AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Will you be interested to signup with us to learn more?

## UNEMPLOYED JOB SEEKER – CA (NO)

Yes sure.

< USER SAYS

CAREER PREFERENCE (YES-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.



## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

I cannot get a job

< USER SAYS

UNEMPLOYED JOB SEEKER PERSONA

1. A\_LookforJob

I know, its tough finding a job these days. Let me help you find a suitable job! First, I need to know what was your last position and how long you had been in it?

I use to work as a software engineer for about 3 years.

< USER SAYS

ELICIT EMPLOYMENT DETAILS

I have noted your employment details. I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies: [COMPETENCIES]

I know Node.js and have PMP and IOT knowledge.

< USER SAYS

ELICIT COMPETENCY

1. D\_ElicitEmployDetails

That's a great set of skills, here are some jobs you might find interesting.



Full Stack Software Engineer, Java-Banking Tech  
Posted 3 weeks ago  
89 Applicants



SecDb Senior C++/Java Software Engineer - Core Engineering  
Posted 3 weeks ago  
60 Applicants

## Level Up

If given an opportunity, who do you aspire to be?

No one really

< USER SAYS

CAREER ASPIRATION (NO)

That's alright. Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I will want to work in management roles

< USER SAYS

CAREER PREFERENCE

I will suggest you gunning for the Senior Director. Sounds good?

Not Really...

< USER SAYS

CAREER PREFERENCE - NO

Sure, no worries. I hope I have helped you. Maybe you can consider some of these courses to improve your skills?

  
NICF-Cognitive Systems(SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

  
NICF-AISP Qualified Information Security Professional Course (SF)  
5 DAYS  
9 AM TO 5 PM

Will you be interested to signup with us to learn more?

## UNEMPLOYED JOB SEEKER – CA (NO)

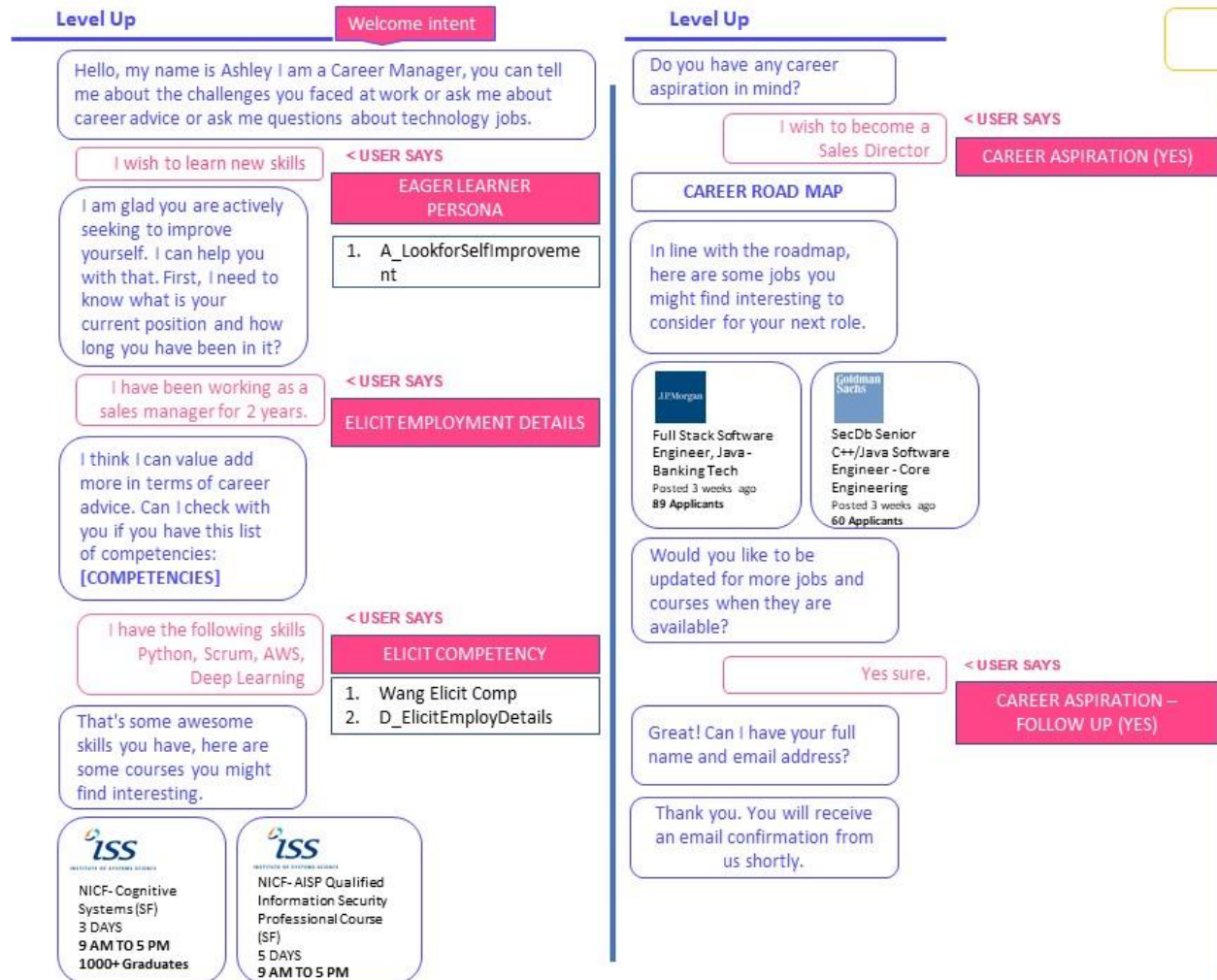
Yes sure.

< USER SAYS

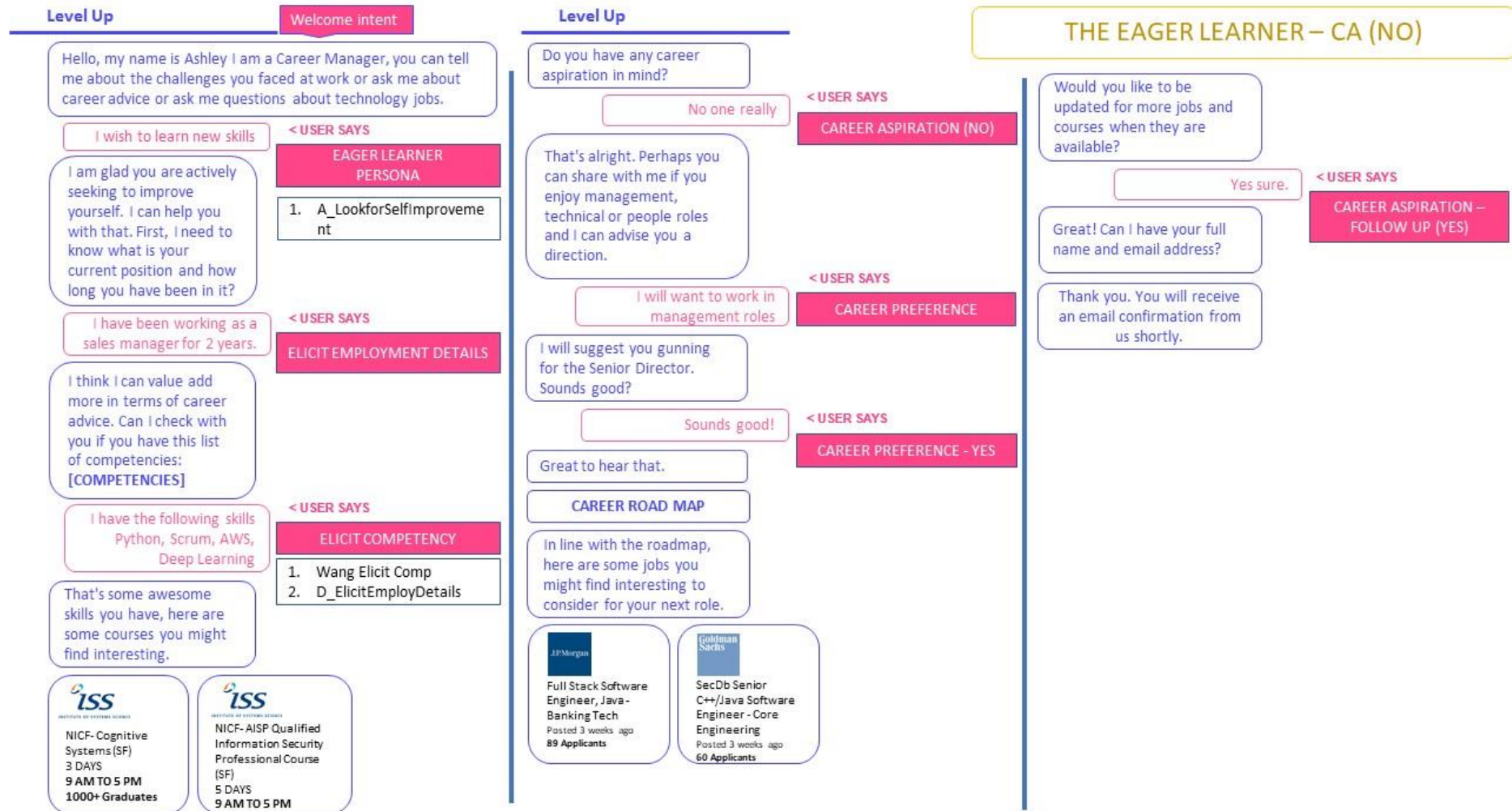
CAREER PREFERENCE (NO-YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.



## THE EAGER LEARNER – CA (YES)



## Level Up

Welcome intent

Hello, my name is Ashley I am a Career Manager, you can tell me about the challenges you faced at work or ask me about career advice or ask me questions about technology jobs.

I wish to learn new skills

< USER SAYS

EAGER LEARNER  
PERSONA

1. A\_LookforSelfimprovement

I am glad you are actively seeking to improve yourself. I can help you with that. First, I need to know what is your current position and how long you have been in it?

I have been working as a sales manager for 2 years.

< USER SAYS

ELICIT EMPLOYMENT DETAILS

I think I can value add more in terms of career advice. Can I check with you if you have this list of competencies:  
[COMPETENCIES]

I have the following skills  
Python, Scrum, AWS,  
Deep Learning

< USER SAYS

ELICIT COMPETENCY

1. Wang Elicit Comp
2. D\_ElicitEmployDetails

That's some awesome skills you have, here are some courses you might find interesting.

  
NICF- Cognitive  
Systems(SF)  
3 DAYS  
9 AM TO 5 PM  
1000+ Graduates

  
NICF- AISP Qualified  
Information Security  
Professional Course  
(SF)  
5 DAYS  
9 AM TO 5 PM

## Level Up

Do you have any career aspiration in mind?

No one really

< USER SAYS

CAREER ASPIRATION (NO)

That's alright. Perhaps you can share with me if you enjoy management, technical or people roles and I can advise you a direction.

I will want to work in management roles

< USER SAYS

CAREER PREFERENCE

I will suggest you gunning for the Senior Director. Sounds good?

No.

< USER SAYS

CAREER PREFERENCE - NO

Sure, no worries. I hope I have helped you. Maybe you can consider some of these jobs next?

  
Full Stack Software  
Engineer, Java -  
BankingTech  
Posted 3 weeks ago  
89 Applicants

  
SecDb Senior  
C++/Java Software  
Engineer - Core  
Engineering  
Posted 3 weeks ago  
60 Applicants

## THE EAGER LEARNER – CA (NO)

Would you like to be updated for more jobs and courses when they are available?

Yes sure.

< USER SAYS

CAREER ASPIRATION –  
FOLLOW UP (YES)

Great! Can I have your full name and email address?

Thank you. You will receive an email confirmation from us shortly.



## Annex D – List of career positions

List of Career Positions		
Software Engineer	Solution Architect	Head
Senior Software Engineer	Senior Solution Architect	Senior Head
Principal Software Engineer	Consultant	Senior Project Manager
Software Manager	Senior Consultant	Technical Manager
Senior Software Manager	Analyst	Senior Technical Manager
Software Director	Senior Analyst	Programme Manager
Senior Software Director	Sales Manager	Technical Lead
Chief Technology Officer	Senior Sales Manager	Project Manager
Chief Information Officer	Sales Director	Chief Operating Officer
Intern	Senior Sales Director	Manager
Engineer	President	Presales Consultant
Senior Engineer	Vice President	Operation Manager
Principal Engineer	Professor	Senior Manager
Software Developer	Director	Product Manager
Senior Software Developer	Senior Director	Senior Presales Consultant