|  |  |
| --- | --- |
| **Employee Name**  Subramaniam Ramanathan Murugappan | **Employee No**  1865686 |

|  |  |
| --- | --- |
| **Client Name (complete legal name)**  Citibank, N.A. | **Worksite Address(es) (full address)** Citibank, N.A.  6400 Las Colinas Blvd,  Irving, TX - 75039. |

**All Questions MUST be answered**

**1. Petitioning Entity:** TCSL

**2. ROLE that associate will perform at the project**

Select **one role** from the appropriate Appendix at the end of this document that **best** describes the associate’s role on the US project.

*Do not list the role here – it must be indicated directly in the appendix by marking the appropriate box with an “X.” Do not highlight the box.*

NOTE: Most TCS roles are covered in these Appendices. ONLY If the associate’s role is not covered, provide the job title and detailed job description here so that we can determine the appropriate role.

**3. Please identify the JOB LEVEL** (*boxes are fillable – please mark the appropriate box with an “X.”*)

**Intermediate:** The job requires basic competency. The associate will receive moderate supervision and will continue to build skills and knowledge in the role (i.e. still developing). The associate will apply standard procedures to solve problems and will apply independence only with regard to straightforward problems/issues.

**Senior/Lead:** The job requires in-depth knowledge. In associate will handle complex issues and will perform the duties of the position independently with minimal supervision. The associate will apply new perspectives to solve non-standard problems where a precedent may not exist. Will act as a resource to colleagues with less experience.

**Master/Guru:**  The job requires specialized depth and/or breadth of expertise. The associate will serve as an expert within a discipline/function and will interprets internal or external business issues and recommend solutions/best practices. The associate will solve complex problems and will be expected to take a broad perspective to identify solutions. The associate will work independently, with guidance in only the most complex situations. May supervise other staff.

**4. Please list the core technologies, languages, and systems the associate will work with in the proposed role:**

**Languages** : Java, JavaScript, SQL, JQL, C++, C, Python, Visual Basic, HTML, PHP

**Database** **Systems** : Oracle Database, MySQL, PostgreSQL, MariaDB

**Operating** **Systems** : Linux, Windows, Android

**Technologies & Software** : Microservices, Spring Boot, RESTful web services, IntelliJ IDEA, Spring Tool Suite (STS), SonarQube, Release Lifecycle Management (RLM), Oracle SQL Developer, Pivotal Cloud Foundry (PCF), AppDynamics, Splunk, Jira, Jenkins, Source Tree, Bitbucket, GitHub, Postman, SoapUI, Confluence, Adobe Photoshop CS 6, Visual Studio, Eclipse, Android Studio

**5. Client description (3-4 sentences):**

Citi works tirelessly to provide consumers, corporations, governments and institutions with a broad range of financial services and products. It strives to create the best outcomes for our clients and customers with financial ingenuity that leads to solutions that are simple, creative and responsible.

Citi's mission is to serve as a trusted partner to our clients by responsibly providing financial services that enable growth and economic progress. Core activities are safeguarding assets, lending money, making payments and accessing the capital markets on behalf of our clients. Citi has 200 years of experience helping clients meet the world's toughest challenges and embrace its greatest opportunities. Citi, being the global bank, is an institution connecting millions of people across hundreds of countries and cities.

Citi protects people's savings and helps them make the purchases from everyday transactions to buying a home that improve the quality of their lives. Citi helps the client to understand how to invest for future needs such as their children's education and their own retirement, and help them buy securities such as stocks and bonds.

Citi works with companies to optimize their daily operations, whether they need working capital, to make payroll or export their goods overseas. By lending to companies large and small, Citi helps them grow, creating jobs and real economic value at home and in communities around the world. Citi provides financing and support to governments at all levels, so they can build sustainable infrastructure such as housing, transportation, schools, and other vital public works.

These capabilities create an obligation to act responsibly, do everything possible to create the best outcomes, and prudently manage risk. If it falls short, Citi will take decisive action and learn from our experience.

Citi strives to earn and maintain the public's trust by constantly adhering to the highest ethical standards. Citi asks the colleagues to ensure that their decisions pass three tests: they are in our client’s interests, create economic value, and are always systemically responsible. When we do these things well, we make a positive financial and social impact in the communities we serve and show what a global bank can do.

**6. Project description and Role of TCS (3-4 sentences):**

**Citi** aims to develop an enhanced in-house solution (Inter Institutional Transfer (IIT)) for transferring money between the customers internal (Citi) and external (Non-Citi) bank accounts which is also known as Me to Me Transfer. The project plans to allow customers to add external bank accounts through Yodlee (external solution) and other in-house solutions such as Early Warning System (EWS) and Trial Deposit (TD) and also plans to develop in-house solution for handling the transfer mechanism (ACH) across all channels of usage, which includes web and mobile devices. The aim is not just to provide a faster and better way of transferring money to the customers, but also to let the customers perform tasks with ease and reduce the need for more complications.

**Citi** is also planning on integrating all transfer solution such as

1. Linked Account Transfer (LAT) - Transfer between internal (Citi) bank accounts.
2. Inter Institutional Transfer (IIT) - Transfer between internal (Citi) and external (Non-Citi) bank accounts.
3. Real Time Payment (RTP) - Transfer from external (Non-Citi) to internal (Citi) bank accounts and money is transferred instantly.

The above all modes of transfer is planned to be integrated into newly revamped LAT solution which is also in development. The project cuts across several features in the Citibank online application including but not limited to Login, Enrollment, Account Summary, Rewards, Payments and Transfers, Portfolio Finance Management, Promos and campaign, contextual offers and host of other features. Users will be offered a default schema of features by default. But there will be a way to customize that based on choice, behavioral learning, and customer profile attributes etc.

The services in the backend are also being developed to fit into trend Microservice architecture, which Citi is embarking on. So, the large monolithic application will be decomposed into miniature, far nimble micro services which will be cloud native in nature. This will also involve reengineering and re-architecting some of the existing systems at Citi to fit the distributed ecosystem.

Citi being a global enterprise, the services will be built keeping global needs in mind with required flexibility to adapt to the needs of markets. The project also aims to pioneer a fully automated Continuous Integration and Continuous Delivery (CI CD) pipeline to enable faster time to market and increase Citi’s overall agility.

TCS helps Citi by providing resources who can help in the development and delivery of the above-mentioned projects. Some of the duties performed by Subramaniam in the above projects are listed below.

Job Duties:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Duty** | **Description of Duty** | **Skills Required for Duty** | **% of Time** |
| 1 | Review epics and user stories, analyze impact on functionality and modules, perform feasibility analysis based on current architecture & design, bridge gaps in requirements by suggesting necessary modifications based on application knowledge. | Subramaniam will participate in the requirement discussion, User Story grooming sessions with Product Manager/Business Analyst and is responsible to come up with questions, elicit requirements etc.  He is also required to provide technical insight for Product Managers to create technical user stories required to complete the implementation. | Analytical Skills and subject matter expertise in relevant domains (banking & finance).  Familiarity with sprint planning and tools like Jira.  Experience with agile software development and scrum delivery methodology. | 10% |
| 2 | Define system architectural changes. | Subramaniam will have an understanding of the existing system architecture and will propose enhancements or modifications needed to cater to the requirements in hand based on that knowledge.  He will also perform an in-depth research of the proposed tech stack and hence determine feasibility of adopting the same or improvements/modification if any.  In some cases, depending on complexity of the requirement, he might also have to do proof of concept by implementing a part of the requirement in lower environments to ascertain that the proposed architecture indeed is valid. | Experience with & understanding of complex Enterprise architecture. | 5% |
| 3 | Perform impact analysis details mentioning all the components impacted due to new business requirements. | Based on enterprise architecture knowledge, Subramaniam will analyze impact for the given requirement on all systems and applications in order to prepare an estimate of the effort required.  Based on these estimates, proper capacity planning is then done for each impacted team. | Analytical skills, planning and subject matter expertise in relevant domains (banking & finance), planning skill. | 5% |
| 4 | Prepare high level and low-level design document. | Subramaniam will prepare high level & detailed level design documents, which will include algorithms, flow charts, UML diagrams, system constraints etc.  They might even include pseudo code from the proof of concept, which he would have done already.  He will apply his knowledge of industry proven technical frameworks and design patterns to come up with solution to the complex business requirements. | Argo UML, Microsoft Visio. | 10% |
| 5 | Write lines of code & develop programs to address the business requirement and satisfy the acceptance criteria as mentioned in the user story. | After requirement gathering and user stories are defined and assigned to the associate, Subramaniam is responsible to write code based on the technical design and integrate with the main stream of the software code.  Subramaniam will unit test his code to ensure that it meets all the acceptance criteria and achieves business objectives.  He will pay attention to reusability, maintainability by developing common components and bringing in modularity. | Extreme programming paradigm.  Proficiency in Java, Spring Boot, SQL.  Tools: IntelliJ, Spring Tool Suite (STS), Oracle SQL Developer, Bitbucket, Source Tree. | 30% |
| 6 | Get code review completed by self and from peers and engage technical lead for review of the code for final implementation. | Subramaniam will get the developed code reviewed by peers and tech leads as well as review code of his peers.  He will then resolve all the review comments as well as fix issues raised by static code analysis tools or quality gateways.  He will also update the coding standard guidelines as per recent learning and best practices. | Knowledge of design patterns, programming skill in Java latest versions and knowledge of relevant frameworks and libraries.  Good handle on application security and vulnerability loopholes.  Tools: SonarQube, Bitbucket, Source Tree. | 5% |
| 7 | Management of source code and project documents using designated tool. | Subramaniam will use enterprise source code management tool to check in working code from time to time, resolve merge conflicts if any, merge from one branch to another using CI CD triggers.  He will also ensure that proper code is transmitted into all necessary branches before triggering executables for deployment in different environments. | Experience with setting up continuous integration and continuous delivery pipeline for enterprises.  Tools: Bitbucket, Source Tree, Jenkins, Release Lifecycle Management (RLM), Confluence etc. | 5% |
| 8 | Define and write test cases satisfying the acceptance criteria mentioned in the user stories. | Subramaniam is responsible for writing and running all the unit test cases, ensuring that all the cases are passed.  Ensures apt test coverage and that the code successfully makes it through quality gates by covering as many scenarios during Test Driven Development (TDD) and Behavioral Driven Development (BDD) as possible.  Run the integration test cases in a lower environment and ensure they are passing. | Test Driven Development, Behavior Driven Development.  Junit (TDD) & TestNG (BDD).  Tools: IntelliJ, Postman, SoapUI. | 15% |
| 9 | Perform analysis of the defects injected due to new code, provide a fix and validate all the defects. | Subramaniam will take end-to-end responsibility of all the user stories assigned to him starting from development to production cutover.  He will ensure that all the defects detected during testing in various environments such as Development, System Integration, User Acceptance are fixed and validated before deployment.  He will also implement recommendations provided by load testing and component testing teams to fix outstanding issues if any to ensure sound performance. | Tools: Jira, IntelliJ, Splunk, PCF.  Code review & understanding skills.  Identify the root cause of the issue. | 5% |
| 10 | Establish working knowledge of new modules in the system and thereby broaden overall system knowledge within the team. | Subramaniam is responsible to gain knowledge of all the systems, which is impacted by his scope of work.    He will host technical and design review meetings to make sure his deliverables are not affecting other systems or vice versa. | Subject matter expertise in relevant domains and technical writing skill. | 5% |
| 11 | Associate needs to take care of the readiness and availability of the Test/PROD environment where the new code will be deployed. | Subramaniam will be responsible for configuration management and deployment of executables across all lower environments as well as work with appropriate stakeholders for the production environment.  He will also fix system integration issues if any and maintain application sanity at all times. | Organization and time management skills, planning skills, configuration management, and server runtime knowledge. | 5% |

**7. Duration of project:** 36 months

**8. Name and effective date of MSA under which your project will fall (do not include copy of MSA):**

MSA between CITICORP CREDIT SERVICES INC. (USA) and TATA Consultancy Services Limited dated on July 17, 2015.

**9. TCS Employee’s direct TCS supervisor information:**

|  |  |
| --- | --- |
| **Name** | Nabarun Konar |
| **Job title** | Project Manager |
| **TCS Employee ID** | 201723 |
| **TCS Email address** | [nabarun.konar@tcs.com](mailto:nabarun.konar@tcs.com) |
| **Contact Number** | +1 (469) 203-1790 |

**10. Will the above-named TCS supervisor work on site at the same location as the TCS employee?**

YES  NO

**11.** **On a day-to-day basis, will TCS managers be responsible for directly supervising the technical aspects of the associate's activities?**

YES  NO

**12. ONLY If you answered “NO” to question 12, please explain how TCS management will communicate with the client about the associate and monitor the work the associate is doing, and how TCS will provide feedback to the associate:**

**13. Will TCS have the right to control the associate at all times while working in the US in H-1B status?**

YES  NO

**14.** **Will TCS management have responsibility for providing performance reviews to the associate?**

YES  NO

**15.** **Will TCS management have responsibility for removing the associate from the project and/or assigning the associate to other projects?**

YES  NO

**16.** **Will the client have the right to remove the associate from the project?**

YES  NO

**17.** **Will the client have the right to assign the associate to other projects?**

YES  NO

**18**. **Name and contact details of TCS onsite Manager/Coordinator responsible for LCA posting.**

|  |  |
| --- | --- |
| **Name** | Nabarun Konar |
| **Job title** | Project Manager |
| **TCS Employee ID** | 201723 |
| **TCS Email address** | [nabarun.konar@tcs.com](mailto:nabarun.konar@tcs.com) |
| **Alternate e-mail ID (if not accessing TCS email)** | [nabarun.konar@citi.com](mailto:nabarun.konar@citi.com) |
| **Contact Number** | +1 (469) 203-1790 |

*Note:* During H1B processing, details of the LCA (Labor Condition Application) must be displayed either electronically or at two locations at the proposed US worksite. If the end client requires physical posting, the notice will be sent by the US Visa team via e-mail to the TCS onsite Manager/Coordinator of the concerned project. This document must be printed and displayed at two locations at the proposed US worksite. Please provide the details of TCS onsite manager/coordinator above who will be responsible for this activity. LCA posting e-mail will be sent to the Manager’s TCS e-mail ID by default. If the Manager/Coordinator is not accessing TCS e-mails, provide alternate e-mail ID above.

**19. Person to contact with questions about PRD:**

|  |  |
| --- | --- |
| **Name** | Nabarun Konar |
| **Job title** | Project Manager |
| **TCS Employee ID** | 201723 |
| **TCS Email address** | [nabarun.konar@tcs.com](mailto:nabarun.konar@tcs.com) |
| **Contact Number** | +1 (469) 203-1790 |

**\*\*REQUIRED PRIOR TO SUBMISSION\*\***

**Declaration from the Manager who reviewed the PRD**

*I hereby confirm that I personally reviewed the completed PRD and the information provided in the PRD, in particular the end client name, worksite address, job role, and job level, is accurate.*

Name, title of TCS manager who has reviewed the information above and confirms its accuracy.

Manager Name: Nabarun Konar\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Manager Title: Project Manager\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**APPENDIX A**

**IT Development, Design & Analysis Roles**

The below roles require at least a Bachelor’s degree or its equivalent in Computer Science, Computer Engineering, Information Systems, or a directly related specialty Information Technology field

*Boxes are fillable – please mark the appropriate box with an “X.”*

**Software Developer, Applications (Software Developer, Applications, 15-1132)**

Develop, enhance, customize, and/or maintain client/industry-specific computer applications software using scientific analysis and mathematical models based on client/industry-specific needs. Analyze user needs and software requirements to determine design feasibility and system performance standards. Store, retrieve, and manipulate data for analysis of system capabilities and requirements. Upgrade existing applications and/or integrate applications with new/existing applications and databases to improve performance and optimize operational efficiency. Create and use reusable technology components. Schedule codes, process codes, and monitor codes per technical design specifications. Perform unit testing per test plans and test cases and document results of validation efforts. Resolve application-related issues experienced by end-users. Provide consulting and/or pre-sales support as needed via initial consulting based on practice solutions offerings, input on RFPs/RFIs/client presentations, and technical reviews of contracts and service agreements. Follow project methodology and documentation processes and adhere to coding standards.

**Software Developer, Systems (Software Developers, Systems Software 15-1133)**

Develop industry-specific solutions based on client needs and manage and upgrade existing systems. Carry out detailed analysis to understand requirements and create code and/or build solutions as per requirements in development/maintenance projects in accordance with coding standards. Perform unit testing per test plans and test cases. Develop and manage systems, upgrade existing systems, and/or integrate systems with any new/existing applications, systems, and databases. Resolve systems related issues experienced by end-users. As needed, provide consulting and/or pre-sales support through initial consulting to engagements based on practice solutions offerings, through input on RFPs/RFIs/client presentations, and through technical reviews of contracts and service agreements.

**Developer (Computer Programmers, 15-1131)**

Develop industry-specific solutions based on client needs and manage and upgrade existing applications. Carry out detailed analysis to understand requirements and create code and/or build solutions as per requirements in development/maintenance projects in accordance with coding standards. Perform unit testing per test plans and test cases. Develop and manage applications, upgrade existing applications and/or integrate application with any new/existing applications and databases. Resolves application related issues experienced by end-users. As needed, provides consulting and/or pre-sales support through initial consulting to engagements based on practice solutions offerings, through input on RFPs/RFIs/client presentations, and through technical reviews of contracts and service agreements.

**Developer User Interface (Web Developers, 15-1134)**

Design, develop, modify, test and maintain robust, scalable website systems. Utilize mark-up and scripting languages as well as programming languages on various platforms to integrate the Internet, database technology and current trends in Web technology with other computer applications and enterprise systems. Design, develop and implement new software components to ensure system-wide efficiency, reliability and compatibility and to maximize system performance. Analyze user needs to implement website content, graphics, performance, and capacity.

**Analyst (Computer Systems Analysts, 15-1121)**

Responsible for requirements gathering and requirements analysis in area of specialization. Networks with internal and external stakeholders, conducts interviews and gathers data for analysis. Assists with identifying reports, journals and other market data for incorporation into overall analysis. Work with stakeholders to understand current state and to identify the future state for the proposed solution. Analyze data and identify gaps in the proposed solution, make recommendations for resolving gaps, and monitor results. Responsible for overall coordination of user acceptance testing and training.

**Designer (Computer Systems Analysts, 15-1121)**

Responsible for system design efficiency and for creating system design specifications and/or database specifications. Participates in scenario discussions to clearly understand business requirements for implementation and assists with product planning and effort estimation. Identifies high level process flows by conducting detailed analysis on requirements and formulates functional/technical design documents. Defines high/low level designs and the relationships between various modules with respect to security and interdependencies. Conducts design reviews and contributes to design automation to improve design efficiency and optimization. As needed, responds to RFPs and RFIs to meet client requirements.

**Architect (Computer Systems Engineers / Architects, 15-1199)**

Strategically architect, design, develop, and implement efficient information systems and/or operations systems in support of core enterprise functions. Understand business requirements, study existing application landscape, and identify redundant/ineffective systems. Conceptualize technical solutions to complex problems and maximize benefit of IT systems investments. Work closely with clients to gain organizational commitment for all systems and software plans, as well as evaluate and guide the selection of technologies required to complete those plans. Coordinate with offshore development team(s) to identify priorities and update scope and delivery schedule. Create data migration/system integration strategies. Monitor system performance to detect and resolve problems during deployment and support change management.

**Analyst – Testing (Software Quality Assurance Engineers & Testers, 15-1199)**

Responsible for testing of applications. Develop and execute software test plans in order to identify software problems and their causes. Develop testing programs that address areas such as database impacts, software scenarios, regression testing, negative testing, error or bug retests, or usability. Document software defects, using a bug tracking system, and report defects to software developers. Plan test schedules or strategies in accordance with project scope or delivery dates.

**Data Warehouse Specialist (Data Warehousing Specialists, 15-1199)**

Design, develop and implement enterprise data warehouse and datamart models, logical data model, and physical data model. Analyze requirements, program and configure warehouses of database information, and provide support to warehouse users. Review data mart/warehouse deliverables, and suggest and co-create standards and guidelines. Perform data quality and profiling activities, advise on data quality issues, and provide analysis on data collection, mapping, aggregation and balancing functions. Develop mappings, define workflows and tasks, monitor sessions, export and import mappings and workflows and perform backup and recovery. Liaise with business users and enterprise architects as needed.

**Analyst – Information Security (Information Security Analysts, 15-1122)**

Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. Responsible for requirements gathering and requirements analysis in area of specialization. Networks with internal and external stakeholders, conducts interviews and gathers data for analysis. Assists with identifying reports, journals and other market data for incorporation into overall analysis. Work with stakeholders to understand current state and to identify the future state for the proposed solution. Analyze data and identify gaps in the proposed solution, make recommendations for resolving gaps, and monitor results. Responsible for overall coordination of user acceptance testing and training.

**Business Analyst (Computer Systems Analysts, 15-1121)**

Assist with analysis of trends and customer scenarios and generate business/industry focused reports. Support project scoping and planning by defining problem and developing a consulting methodology and analysis template. Collect, analyze, and synthesize pertinent data. Apply business/industry insights to draw conclusions and formulate strategic recommendations. Write reports/develop presentations on findings and develop and articulate clear value propositions.

**Functional Consultant (Computer Systems Analysts, 15-1121)**

Provide functional expertise in a sub-line of business and leverage domain knowledge and experience to facilitate the most appropriate solution design. Analyze customer needs, perform impact analysis, participate in designing business process requirements, and ensure completeness and quality of the functional design. Investigate, analyze, and solve software/business/functional requirements related problems. Liaise with technical teams and client throughout development/implementation. Provide go-live support to ensure solution performs and is delivered as expected, and support software testing and configuration. Analyze gaps after assessing customer requirements. Prepare test scripts and simulate in the form of a prototype. Create end user manual and user training materials. Create functional designs and produce business process documentation to support future development, design, and building of applications. Assist in defining business process and change management. Develop and publish white papers. Collaborate with other domains to develop solution based offerings.

**Embedded Systems Design Engineer (Software Developers, Systems Software, 15-1133)**

Design and implement solutions for the development high-performance and robust embedded platforms. Develop systems, software, firmware, device drivers, components and computing systems software to be applied to and integrated with engineering, scientific and manufacturing requirements.  Debug and optimize code to ensure superior system performance. Assist in maintaining existing code (in terms of functionality, reliability, and performance). Create and maintain software design documentation.  Work with client teams and functional, quality assurance and offshore teams to ensure development of integrated solutions.

**Engineering Analyst (Computer Systems Analysts, 15-1121)**

Perform engineering analysis based on math models to evaluate the performance of components, systems, or subsystems of a product. Understand analysis/validation requirements and perform effort estimation. Obtain inputs from other engineers and vendors for product analysis/validation. Define analysis methods and math modeling requirements, perform analysis, and review math models per applicable standards/guidelines. Review analysis results, perform design calculations, and prepare analysis report with suggestions/alternative designs. Perform peer analysis review as needed. Suggest or update standards, process, and checklists for quality assurance. Create project documentation and maintain project status report. Deliver analysis to client or releases for manufacture. Participate in the evaluation of new software functionality for feasibility and conversion to new systems. Identify challenges and opportunities to meet business needs, optimize and streamline operations, and ensure appropriate controls. Identify, investigate, and resolve complex business process and system problems. Prepare appropriate procedures and documentation/diagrams to support client/users. Apply knowledge of process control tools, statistical sampling, and other analytical techniques to maximize the quality and flow of the product through the production line. Identify, analyze, and manage risk through the product lifecycle. Review the accuracy of work progress to ensure quality services and products. Research and develop innovative techniques for analyzing and measuring quality and for modeling end user behavior. Develop and implement time studies to compile data utilized to build multi variable standards.

**Anti-Money Laundering Analytics Expert (Statisticians, 15-2041)**

Apply knowledge of data analytics, Anti-Money Laundering (AML) systems, analytical advancements, and regulatory guidelines to design, build, test, and review AML analytics frameworks. Study client Anti-Money Laundering (AML) framework, needs, and objectives; develop stochastic models; and perform threshold tuning to generate AML alerts

**Senior Data Scientist (Computer Information Research Scientists, 15-1111)**

Perform optimization, forecasts, recommendations based on Machine Learning algorithms, analysis and derive insights. Provide recommendations based on Deep Neural Network such as tensorflow/keras. Program in Python, R, Spark to perform Deep Learning and Machine Learning based models. Work on time series and perform predictions on time series using Time Series based models and Deep Learning models. Generate visualizations using matplotlib, seaborn, D3JS. Work any database, NoSQL, Hadoop components like Hive, HBase and scripts like shell, perl, javascripts.

**Technical Lead (IT Project Managers, 15-1199)**

Provide technology inputs and technical leadership for the design, development, and delivery of products and services. Lead the technical implementation and functions as a point of escalation for the resolution of technical matters. Identify technical risks and plan contingency / mitigation actions. Plan project deliverables and monitor progress against plan. Liaise with client and internal teams to identify routine issues and keep stakeholders updated on project. Ensure verification of deliverables per quality assurance plans and ensure the delivered solution meets technical specifications and design requirements. Identify and assign roles to team members, set project goals, and ensure optimum utilization of resources, including infrastructure and manpower.

**Project Lead (IT Project Managers, 15-1199)**

Responsible for project planning and delivery within agreed timeframes and for enhancing the quality of deliverables through analytical and intellectual leadership. Perform requirements analysis and develop estimates based on feasibility and impact analysis. Participate in project meetings and assume responsibility for tracking activities, stages, and deadlines. Identify and assign roles to team members and set project goals. Maintain project quality through reviews, metrics, and quality control measures and ensure optimum utilization of resources, including infrastructure and manpower.

**APPENDIX B**

**Administration & Support Roles**

The below roles require at least a Bachelor’s degree or its equivalent in Computer Science, Computer Engineering, Information Systems, or a directly related specialty Information Technology field.

*Boxes are fillable – please mark the appropriate box with an “X.”*

**System Administrator (Network and Computer Systems Administrators, 15-1142)**

Responsible for ensuring the reliability, stability and recoverability of specific server environment. Perform server administration through server set up, periodic checks and through analysis and implementation of fault tolerant systems. Remotely manage server and disk space. In addition, perform web based administration through daily FTP uploads. Sets up firewalls and authorizes systems, and performs periodic back-up of data and automates reporting tasks. Executes hardware and software updates when necessary. Monitors and optimizes databases as appropriate, and performs capacity planning and roll-out planning for tool/system upgrades. Incorporates new systems and upgrades existing systems, and installs, configures and troubleshoots as needed.

**Network Administrator (Network and Computer Systems Administrators, 15-1142)**

Responsible for installing, configuring and supporting an organization’s local area network (LAN), wide area network (WAN), and internet system or segment of a network system. Monitor network to ensure network availability to all system users, and perform necessary maintenance to support network availability. Supervise network support and client/server specialists. Maintain and administer computer networks and related computing environments including computer hardware, system software, application software and all configurations. Maintain control records. Plan, coordinate, and administer network security measures in order to protect data, software, and hardware. Monitor the performance of computer systems/networks and coordinate computer network access and use. Design and implement network configurations, network architecture (including hardware and software technology, site locations and integrations of technologies) and systems. Responsible for remote management of network by handling incident/request escalations, and providing solutions using remote management tools.

**Database Administrator (Database Administrators, 15-1141)**

Responsible for administering one or more databases in a production environment. Installs and upgrades servers and application tools. Allocates system storage and plans for future allocations. Creates primary objects (tables, indexes, views) after an application has been designed, and creates storage once an application is developed. Enrolls users and ensures system is secure; monitors user level access to database(s); and monitors database performance optimization. Plans for backup and recovery of the database and clusters, replicates and normalizes data as required. Responsible for high end database design and modelling including performance tuning, input/output tuning, and capacity planning.

**APPENDIX C**

**Engineering & Industrial Services Roles**

The below roles require at least a Bachelor’s degree or its equivalent in Mechanical Engineering, Electronics Engineering, Computer Engineering, or a directly related specialty field.

*Boxes are fillable – please mark the appropriate box with an “X.”*

**Design Engineer (Mechanical Engineers, 17-2141)**

Analyze and design components or subsystems of a product. Perform technical requirements collection and effort estimation. Review design instruction or end-client objectives and clarify as needed. Obtain inputs from other engineers and vendors for product design/analysis. Perform design calculation and design/analysis per applicable standards/guidelines. Develop alternative design/suggestion and analyze design solution to identify best-fit solution. Review designs to ensure designs meet stated or implied requirements, including international standards. Perform peer design/analysis review as needed. Suggest or update standards, process, and checklists for quality assurance. Create project documentation and maintain project status report. Deliver design to client or releases for manufacture.

**Product Engineer (Mechanical Engineers, 17-2141)**

Design and develop new products and/or the systems used to produce them with the goal of improving the efficiency and performance of existing designs, machinery and equipment, systems and/or products. Perform technical requirements collection, project estimation, resource scheduling, and cost control. Apply software technology to iteratively design optimal profiles to achieve superior performance of products or device systems taking into account materials selection, cost, maintenance, safety regulations, legal stipulations, the environment, quality and other production guidelines. Generate concepts, performance and production criteria for design synthesis and transfer for downstream development of final product specifications and technical design reviews. Validate design layouts, dimensions and feature call outs in engineering specification drawings. Design, model and test prototypes. Responsible for defects tracking, root cause analysis and abatement plan implementation to prevent defects in various modeling, drafting and engineering change order related projects.

**Analysis Engineer (Mechanical Engineers, 17-2141)**

Responsible for validating the engineering design for mechanical, thermal and flow elements using finite element methods. Analyze data using finite element analysis, computer-aided engineering, computational fluid dynamics, etc., run simulations, and provide performance verification with the goal of streamlining all aspects of the engineering design process.

**Validation Engineer (Validation Engineer, 17-2199.02)**

Apply engineering analysis and expertise to validate that mechanical, electromechanical, and/or embedded products or systems meet requirements and specifications and they fulfill their intended purpose. Design or plan protocols for equipment or processes to produce products meeting internal and external purity, safety and quality requirements. Prepare, maintain, or review validation and compliance documentation, such as engineering change notices, schematics, or protocols. Prepare detailed reports or design statements based on results of validation and qualification tests or reviews of procedures and protocols.

**Automotive Engineer (Automotive Engineers, 17-2141.02)**

Develop new or improved designs for vehicle structural members, engines, transmissions, or other vehicle systems, using computer-assisted design technology. Perform technical requirements collection, project estimation, resource scheduling, and cost control. Apply software technology to iteratively design optimal profiles to achieve superior performance of products or device systems taking into account materials selection, cost, maintenance, safety regulations, legal stipulations, the environment, quality and other production guidelines. Generate concepts, performance and production criteria for design synthesis and transfer for downstream development of final product specifications and technical design reviews. Validate design layouts, dimensions and feature call outs in engineering specification drawings. Design, model and test prototypes. Responsible for defects tracking, root cause analysis and abatement plan implementation to prevent defects in various modeling, drafting and engineering change order related projects.

**Manufacturing Engineer (Manufacturing Engineer, 17-2199.04)**

Analyze and define production processes to achieve product requirements. Set up, test, and adjust manufacturing machinery or equipment, using any combination of electrical, electronic, mechanical, hydraulic, pneumatic, or computer technologies. Contribute to production automation to improve manufacturing efficiency and optimization.

**Embedded Hardware Design Engineer (Computer Hardware Engineers, 17-2061)**

Design and implement solutions in the development of high-performance and robust embedded platforms. Responsible for embedded multi-layer hardware design, including component selection, schematics, and layout.Work with client teams and functional, quality assurance and offshore teams to ensure development of integrated solutions.

**Product Engineer – Embedded (Electronics Engineers, Except Computer, 17-2072)**

Support the design of subsystems for high-performance and robust embedded platforms. Layout, build, test, troubleshoot, repair, and modify developmental and production electronic components, parts, equipment, and systems, applying principles and theories of electronics, electrical circuitry, engineering mathematics, electronic and electrical testing, and physics.

**Mechanical Modeler (Mechanical Drafters, 17-3013)**

Develop detailed design drawings and specifications for mechanical equipment, dies, tools, and controls, using computer-assisted drafting (CAD) equipment. Lay out and draw schematic, orthographic, or angle views to depict functional relationships of components, assemblies, systems, and machines. Coordinate with and consult other workers to design, lay out, or detail components and systems and to resolve design or other problems. Review and analyze specifications, sketches, drawings, ideas, and related data to assess factors affecting component designs and the procedures and instructions to be followed. Modify and revise designs to correct operating deficiencies or to reduce production problems. Compute mathematical formulas to develop and design detailed specifications for components or machinery, using computer-assisted equipment.

**Electromechanical Modeler (Mechanical Drafters, 17-3013)**

Support computer-based process control, instrumentation, and/or machine design of machines and devices which combine electronic and mechanical parts. Develop detailed design drawings and specifications for electromechanical equipment, tools, and controls, using computer-assisted drafting (CAD). Layout and draw schematic or angle views to depict functional relationships of components, assemblies, systems, and machines. Assist the planning of work flow, conduct statistical studies, and analyze production costs.

**Electronic/Electrical Modeler (Electronic Drafters, 17-3012.01)**

Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment. Consult with engineers to discuss and interpret design concepts, and determine requirements of detailed working drawings. Examine electronic schematics and supporting documents to develop, compute, and verify specifications for drafting data, such as configuration of parts, dimensions, and tolerances. Draft detail and assembly drawings of design components, circuitry and printed circuit boards, using computer-assisted equipment or standard drafting techniques and devices. Review work orders and procedural manuals and confer with vendors and design staff to resolve problems and modify design

**Radio Frequency Engineer (Radio Frequency Identification Device Specialists, 17-2072.01)**

Design and implement radio frequency identification device systems using analog and digital communication for passive and active sensing/tracking with application in manufacturing, pharmaceuticals, shipping, construction and agriculture.

**Engineering Lead (Architectural and Engineering Managers, 11-9041)**

Provide engineering inputs and engineering leadership for the delivery of engineering design and analysis. Perform engineering requirements analysis, establish effort estimation, and prepare projections and schedules. Create project documentation and guidelines, such as design instructions and end-client objectives. Liaise with client and internal teams to identify routine issues and keep stakeholders updated on project. Ensure verification of deliverables per quality plans and ensure the delivered solution meets technical specifications and design/analysis requirements. Identify and assign roles to team members, set project goals, and ensure optimum utilization of resources, including infrastructure and manpower.

**Product Consultant (Sales Engineers, 41-9031)**

Understand product capabilities from a functional/business perspective, support existing projects, and support the development of winning solution proposals. Research and evaluate products. Create re-usable knowledge assets through documenting product’s present and future capabilities as well as developing best practices, checklists, procedures, guidelines, and estimations. Provide product solutions for project proposals and identify opportunities for up-selling and cross-selling. Conduct product demonstrations to support client engagements as well as product training to build teams’ competency in product features. Analyze return on investment post-implementation of product. Evaluate the product’s capabilities with respect to similar products available in the market. Evaluate the enhancements being made available in new product releases. Provide product solutions for requests for proposals, including functionality mapping with product features. Monitor progress while keeping key stakeholders updated on customer expectations. Represent product at industry events, make representations to analysts, and evangelize the product. Collaborate with product teams and service organization. Stay current with respect to product features, roadmap, and competitive landscape.

**APPENDIX D**

**Additional Roles**

The below role requires a Bachelor’s degree or its equivalent in Business Administration, Information Systems, Computer Science, or a directly related specialty field.

*Boxes are fillable – please mark the appropriate box with an “X.”*

**Value Consultant (Management Analyst, 13-1111)**

Provide guidance and expert advice to management or other groups on systems or process-related topics. Capture and evaluate business processes on a weekly and bi-weekly basis. Identify the nature and scope of various business problems that arise and facilitate synergy between different groups affected. Understand the business, define technical issues, and analyze, design, and propose solutions to identified problems. Collect business data to create process maps, perform time & motion analyses and process comparisons. Organize review and governance meetings to discuss progress, risks, challenges, and accomplishments. Create proof of concepts to assess stability, interoperability, portability, security, or scalability of proposed design solutions. Conduct process re-engineering studies and provide both tactical and strategic solutions. Interview personnel and conduct on-site observation to ascertain unit functions, work performed, and methods, equipment, and personnel used. Prepare manuals and train workers in use of new reports, procedures or systems according to organizational policy.