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| Microsoft logo, gray text version | |
| **Microsoft Intern Program** |  |
| **Intern Project Plan Template** | |
| This template is intended to be used to prepare for you incoming intern. | |

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| Project Title |
| Real-time inventory routing and rerouting towards long-term fulfillment cost/time minimization |

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| Basic Contact Information | |
| Intern Name | Ryan Wickman |
| Manager Name | Junxuan Li <junxuanli@microsoft.com> |
| Mentor Name | Andrew Ganje <aganje@microsoft.com> |
| Admin Name | Jessica Vereau Herrera <Jessica.Vereau@microsoft.com> |
| Group | Dynamics 365 |
| Team | SCM/IOM Data and Applied Science |

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| Project Summary |
| Traditional distributed order fulfillment has several drawbacks: long order accumulation time, longer order turnover time and myopic decision. We target to develop a novel fulfillment decision engine to tackle the listed drawbacks. More specifically, we target to use state-of-art reinforcement learning to solve the real-time order fulfillment problem. Such decision engine should: (1) require less or negligible order accumulation interval; (2) achieve long-term optimality or near-optimality.  The project consists of four major tasks: (1) problem definition; (2) simulator development; (3) state/action/reward formulation and mapping; (4) RL algorithm tests. |
| Project Goals |
| Sufficient outcome to quality a return offer: (1) clear understanding of the problem; (2) usable simulator; (3) rigorous DP formulation; (4) testing results of at least two RL/DRL algorithms. |

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| Detailed Objectives and Managers Comments |
| List each goal/objective. Goals should be listed in priority order and labeled with P0-P2. For Managers Comments, summarize what success looks like for each goal. Include measurable outcomes to be successful and any deadlines. |

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| Priority Level | Goals | Manager Comments |
| *P0* | *Clear understanding of the problem* | *Intern’s ability to learn and adapt to a product group and understand business requirements* |
| *P0* | *Usable simulator* | *Intern’s coding capability, demonstratable component* |
| *P1* | *Rigorous dynamic programming (MDP/POMDP) formulation* | *Intern’s mathematical modeling capability* |
| *P1* | *Testing results of at least two RL/DRL algorithms* | *Intern’s problem solving ability to search and use state-of-art methodologies.* |

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| Project Plan |
| Below is a plan of milestones for the project, describing the deliverable for each milestone. It is critical to include a Checkpoint milestone mid-way through the internship allowing ample time for adjustments based on progress and feedback. Remember to leave enough time to complete a final report and/or presentation of the project before the end of the internship. |

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| Weeks | Project Milestone Description | Category\* | Deliverable |
| 1 | Onboarding and problem definition sync |  | Know the team, know the problem |
| 2 | Research proposal |  | Preliminary proposal |
| 3-5 | Simulator building |  | Simulator |
| 6 | Midpoint simulator demo |  |  |
| 7 | DP formulation |  | Model doc |
| 8 | Action space mapping |  | Model doc |
| 9-11 | Implement RL algorithms |  | Code + testing result |
| 12 | Presentation |  | Slides |
| 12 | Documentation, code review |  | Final doc + codes |

*\* Categories include the following program elements. These are required as a part of the project evaluation process.*

* *Design and Spec writing*
* *Implementation and coding*
* *Integration and partner management*
* *Presentation and Documentation*

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| Project Contacts |
| Individuals the intern will be working with on a day-to-day basis. |

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| Email Alias | Role | Description |
| junxuanli | Intern Manager | Primary contact, project identification and commitment setting, conducts and writes checkpoint and final connect |
| aganje | Intern Mentor | Day-to-day support, helps access resources needed for the project, provides feedback to manager about progress |
| jevereau | Administrative Assistant | Provides assistance with workplace resources – office setup, special needs, equipment, events, etc… |
| qipengwu | Quality/Development Manager | Responsible for the team ensuring the software is high quality |
| lcash | Group Program Manager | Responsible for the team describing the software to develop |
|  | Recruiter | Primary recruiting contact, monitors overall experience, discusses future employment options at MS, invites to school intern events, etc... |
|  | Onboarding Buddy | Responsible for making intern feel welcome, and for other questions and learn the ropes. |

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| Other Helpful Information |
| Additional resources that may help the intern with their project. |

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| Description | URL/Alias |
| Intern Web Site (including Resource Links) | <https://dev.azure.com/dynamicscrm/OneCRM/_wiki/wikis/OneCRM.wiki/9696/Intelligent-Order-Management> |
| Team Alias |  |
| Team Website |  |
| Related PM Spec |  |
| Related Dev Spec |  |
| Related Quality Spec |  |
| Microsoft Vision |  |
| Redstone Framing Doc |  |
| Project Schedule |  |