UNIVERSITY OF ESSEX

Masters in Computer Science

Unit 12 Future trends in SEPM

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Robotic Process Automation: The Future of Software Engineering Project Management

As we stand on the precipice of a new decade, one technology stands out as a potential gamechanger for software engineering project management: Robotic Process Automation (RPA). This presentation delves into the transformative impact of RPA, exploring its evolution, benefits, and the challenges that lie ahead. Join us as we uncover why RPA is poised to be the most influential trend in shaping the future of software development projects.

Introduction

1- What is RPA?

Robotic Process Automation (RPA) employs software robots, or "bots", to automate repetitive, rule-based tasks within software applications. Imagine a tireless digital worker, mimicking human interactions to input data, generate reports, and streamline workflows, all while seamlessly integrating with your existing systems.

2 - Why it’s the #1 Future Trend?

Unlike traditional automation that often requires complex coding and system overhauls, RPA offers a non-intrusive approach. It operates on the surface layer of your existing software, interacting with applications just like a human user would, making deployment faster, easier, and more cost-effective.

3 - How it affects Project Management

Unlike traditional automation that often requires complex coding and system overhauls, RPA offers a non-intrusive approach. It operates on the surface layer of your existing software, interacting with applications just like a human user would, making deployment faster, easier, and more cost-effective.

3 factors for most influence

1

The global RPA market is experiencing explosive growth, fueled by the increasing demand for process automation across industries. With an estimated market size of $25.66 billion by 2027 and a projected annual growth rate of 40%, its influence on business operations, including software project management, is undeniable.

2

It has the ability to enhance operational efficiency, reduce costs, improve data accuracy, and integrate with emerging tech liek AI and Machine Learning. This convergence of factors positions RPA as a transformative force in the evolution of project management practices.

3

It is also considered to be very versatile, meaning it can be applied to diverse fields. This diversity of use cases also correlates to PM roles that happen to sit across these said industries, technology, finance, healthcare, et cetera.

How does it improve PM roles?

- ## It improves efficiency

  RPA frees project managers from repetitive and time-consuming tasks, such report generation, updating spreadsheets, and sending routine notifications. Consequently, this allows more dedication to things that matter the most for productivity and innovation inside a company.

  More time for strategic planning, risk management, and team collaboration, ultimately leading to smoother project execution and improved outcomes.

- ## Say no to costs

  Since it has the capacity to automate labor-intensive processes, RPA significantly reduces the need for manual intervention, leading to substantial cost savings. It comes down to it allowing for better resourse allocation, and more investments in the product, employee training and other factors that generate business growth.

Software Engineering Project benefits

It already is know to have great upsides for SE projects

1

Reduced Errors

By automating repetitive tasks, RPA significantly reduces the potential for human error, leading to higher quality code, faster development cycles, and improved overall project outcomes.

2

RPA -> Scale

RPA empowers SE teams to effortlessly scale theiro perations, handling larger projects without being bogged down by administrative overhead. This scalability is essential in today's dynamic tech landscape,where agility and rapid response times are paramount to success.

3

More Collaboration

By automating routine tasks, RPA frees up valuable time for software engineers and project managers to focus on more strategic and collaborative activities. This enhanced communication and knowledge sharing leads to a more cohesive team environment, fostering innovation and driving better project outcomes.

AI and RPA

The true power of RPA is unleashed when combined with AI and ML. This can transform RPA to the point where it can handle increasingly complex and more abstract tasks. Imagine it being capable of analysing real-time data, identifying potential risks, and even suggesting course corrections - all without human intervention.

Present

RPA is already streamlining project management by automating repetitive tasks, improving efficiency, and reducing costs.

This initial wave of automation is laying the groundwork for a more intelligent future.

Future

As AI and ML integration matures, RPA bots will become more sophisticated, capable of handling complex decision-making processes, analyzing large datasets for insights, and adapting to changing project dynamics.

Optimal Future

The next decade is envisioned to witness the rise of fully autonomous RPA bots, capable of managing entire projects end-to-end, from planning and resource allocation to risk assessment and quality assurance. (Scary, Exciting, right?)

RPA in restaurant industry

Small context

Primanti Brothers is an 89-year-old restaurant chain. After the COVID pandemic, they identified major inefficiencies in their back-office operations, where regional managers were spending a significant amount of time on manual administrative reporting instead of focusing on operational decision-making, highlighting the need for a more scalable and efficient solution.

They chose RPA integration with IBM

RPA in Restaurant Industry

- ## What it streamlined

  The implementation of RPA automated the daily generation of sales and labour reports, eliminating repetitive manual tasks such as copying, pasting and validating spreadsheet data. Tasks that previously required eight regional managers to spend up to 45 minutes each day, were reduced to an automated process executed in approximately three minutes.

- ## What it enhanced

  By automating report generation, Primanti Brothers saved approximately 2,000 working hours per year, improved reporting accuracy and consistency, and ensured reliable delivery of reports by fixed deadlines. Most importantly, the organisation achieved a full return on investment within three months, while allowing managers to redirect their time towards analysis, planning, and higher-value activities.

Future OF RPA in PM

1 Imagine RPA bots analyzing real-time project data to identify potential bottlenecks, predict risks, and recommend optimal solutions before issues even arise. This level of intelligent automation will empower project managers to make proactive decisions, ensuring projects stay on track and within budget.

2 RPA, powered by AI and ML, will equip project managers with data-driven insights and predictive analytics, enabling them to make informed decisions regarding resource allocation, risk mitigation, and project scheduling. This data-centric approach will minimize guesswork and optimize project outcomes.

3 Rather than replacing project managers, RPA can augment their capabilities, freeing them from mundane tasks and empowering them to focus on strategic thinking, stakeholder management, and driving innovation.

Challenges related to RPA

1

Security Risks

As software bots often require elevated system access and process sensitive operational or personal data. Without proper governance, bots can increase the attack surface, bypass segregation of duties, and replicate data across logs or intermediate files, creating risks in regulated environments such as GDPR or financial reporting.

2

Human Resources

Workers can be resistant due to perceived job threats and disruption to established workflows. Employees may distrust automation or develop workarounds, while organisations are often forced to confront inconsistencies in processes that were previously informal or person-dependent.

3

More Collaboration

Integration remains a significant technical limitation of RPA, particularly when bots rely on user interface interactions with legacy systems instead of stable APIs. UI-based automation is inherently fragile, as minor system updates or performance issues can break workflows and increase maintenance costs. In addition, real-world processes often involve exceptions that are difficult to fully automate using rule-based logic.

Conclusion

As we've explored, Robotic Process Automation will transfrom the way software is built, maintained and managed, influencing software engineering project management. Its ability to streamline workflows, reduce errors, enhance scalability, and integrate with AI, ensures that it will impact the way Project Managers work, especially when security, governance and integration issues are mitigated.

It will allow orgs to be far more efficient, focuse on innovation, and navigate the future of software development with confidence.

References

van der Aalst, W. M. P., Bichler, M., & Heinzl, A. (2018). Robotic Process Automation. Business & Information (s12599-018-0542-4)-272. https://doi.org/10.1007/s12599-018-0542-4.

Grand View Research. (2020). Robotic Process Automation Market Size & Share Report. Retrieved from https://www.grandviewresearch.com .

Accenture. (2021). RPA: AI and Cognitive Technologies*. Retrieved from https://www.accenture.com .

Gartner. (2019). Hype Cycle for Emerging Technologner Research Reports .

Deloitte. (2020). Automation with Intelligence: RPA and AI Integration Trends. Deloitte

Forrester. (2019). The Impact Of RPA On Employee Experience.

PwC. (2020). RPA Risks and Opportunities: Securing Automated Solutions. Pricewaterhouse

Coopers any. (2021). How RPA Is Driving Operational Efficiency. Retrieved from https://www.mckinsey.com

IBM (2022) Primanti Brothers modernizes back-office processes with an RPA bot: AI clocks in – how bots are streamlining restaurant operations. Armonk, NY: International Business Machines Corporation.