

Critical Success Factors for Citizen Development

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Abstract

The purpose of the research was to assess the impact of Citizen Development activities on digital transformation. The research identified eight categories that contribute to the success of Low-code No-code (LCNC) projects: 1) Strategy; 2) Infrastructure; 3) Technology; 4) Processes & Procedures; 5) Governance; 6) Culture; 7) People; 8) Goals & Metrics and selected six critical success factors from these categories: 1) Operational Efficiency; 2) Time Savings; 3) Timeframe to Realize Value; 4) Employee Engagement; 5) Participation; 6) Number of Sponsored Ideas. End users of the digital transformation efforts through Citizen Development were asked to assess the six critical success measures in terms of performance and importance criteria. The research results identified that focus should be applied to improving “Timeframe to Realize Value”, on “Operational Efficiency”, and on “Time Savings” to deliver success.

Keywords

Citizen Development, Low-Code No-Code Application Development, Digital Transformation, Timeframe to Realize Value, Employee Engagement

1. Introduction

1.1. The Citizen Development Initiative

Microsoft Business Operations (MBO) is a multi-faceted team responsible for the global operations of the Commercial, Consumer, Services, Original Equipment Manufacturers (OEM), Cloud Partner, and 1st Party Device lines of business. MBO has set up a Centre of Practice (CoP) to develop and support a community of Citizen Developers using Low-code No-code (LCNC) platforms in order to accelerate Digital Transformation leveraging LCNC technologies. For

MBO, Citizen Development is not about solving all IT application requirements across the enterprise, rather it is about automating operational processes and in doing so reducing the time Operations professionals are spending focused on manual repeatable tasks.

MBO wanted to understand the Critical Success Factors for the Citizen Development Initiative, informing decisions around the successful creation of this community of Citizen Developers.

1.2. What Is a Citizen Developer?

Citizen Developers play a significant role in shaping the future of application development. 41% of employees “outside” of IT departments are building technology and data solutions within enterprises [1]. Citizen Developers are defined as “an employee who creates application capabilities for consumption by themselves or others, using tools that are not actively forbidden by IT or business units,” (Gartner, 2019). Employees are given the tools, trust, and expertise to drive change, innovation, and digital transformation.

Within MBO the intention is to design, build, and implement solutions to deliver greater productivity and operational efficiency. MBO has designed their Citizen Development activities as a team process (Figure 1) in which Citizen Developers collaborate with IT to identify a problem and find solutions; known as Fusion Development. Citizen Developers create applications using LCNC technology, with IT developers providing support for more complex logic as required.

1.3. LCNC Applications

LCNC applications allow the development of custom applications and systems without engaging teams of developers—enabling and driving large-scale digital transformation in response to changing business environments. Benefits include a reduction in development time by 50% - 90%, compared to traditional coding methods [2].

LCNC applications provide the opportunity for organizations to lower barriers to innovation, and in doing so increase user-driven innovation and creativity [3]. Promoting open innovation in this way allows for new and expanded ways to create value and solve problems while providing the tools to allow employees to operate autonomously and drive innovation [4] [5].

1.4. Why Now?

86% of IT decision-makers say shortage of software developers is the biggest obstacle to digital transformation [6]. Software developer supply is falling behind demand, with the US alone facing an expected shortage of 500,000 software developers by 2024 [7].

LCNC platforms offer a solution to meet this growing demand in the face of huge talent shortages, opening innovation to more people by allowing users outside of the traditional IT department to solve their daily process challenges [8].

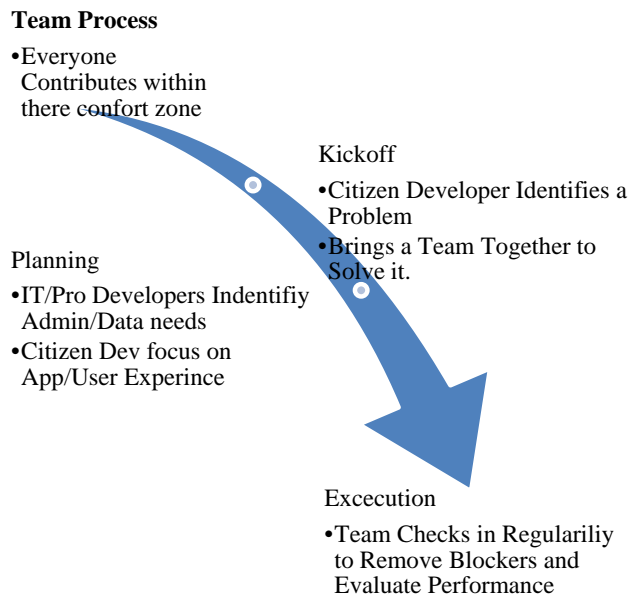


Figure 1. Citizen development team process (Microsoft, 2021:6).

Citizen Development provides a cost-effective solution to take the pressure off the IT department while ensuring business initiatives are not slowed down by limited developer supply. Rather than sending requirements to IT and waiting for prioritization and capacity to develop solutions, Citizen Development increases organizational agility, end user professionals to spin up digital transformation solutions quickly. 80% of applications are expected to be built by LCNC tools by 2024 [1].

2. Defining & Measuring Critical Success Factors for Citizen Development

Defining and measuring success is challenging in defining organizational performance. It is a dynamic, multidimensional, and on-going concept which is at the core of management research.

We developed a framework for measuring success in 2 stages:

- A review of the existing literature identifying citizen development success factors and classifying into eight categories
- From this, narrowing down to six Critical Success Factors to be surveyed by end users of the citizen development initiatives, ranked by performance and importance criteria.

Search Definitions

The literature review was used to create a proposed framework of categories for Citizen Development Success Criteria. The focus was on studies of large multi-national corporations and efforts to implement similar initiatives, including peer reviewed Participatory Action and Case Study Research. Participatory Action and Case Studies take a responsible approach which balances the academic

and practical impact on businesses [9]. Henriette *et al.* (2016) [10] support this highlighting that case studies and action research can enable an improved understanding of the digital transformation process, gaining valuable and real-world insights into the complex questions such as those being explored by MBO. The literature review was then categorised thematically.

As “Citizen Development,” and “Citizen Developer” are relatively new terms, finding relevant literature to review was a challenge, namely due to:

- limited life span of keywords due to fast-paced technology changes
- use of “buzzwords” within the literature which appear and disappear.

Despite the attention of practitioners, it is yet to achieve significant research interest from academia [11].

A wide range of databases and key word search criteria were consulted, given the lack of academic research on the area. These are

- Business Source Complete
- ABI/Inform Global
- Web of Science
- Scopus
- Google Scholar

Given the limited academic literature available, Nexis database was used to search for practitioner literature.

There is a widely acknowledged overlap between Citizen Development and various types of Digital Transformation, Software Development and Business Innovation communities. **Table 1** shows relevant keyword search combinations for searching on these databases recommended by [12] [13] [14].

3. Literature Derived Categories of Success

The following eight categories were identified from the literature review.

3.1. Strategy

Citizen Development promotes a digital business strategy which fuses business and IT strategy.

Pisano (2015) [15] defines strategy as a “commitment to a set of coherent, mutually reinforcing policies or behaviours aimed at achieving a specific competitive goal,” (p. 46).

Bughin *et al.* (2019) [16] showed that clear priorities and focused themes that align with business outcomes achieve better results. It is important that transformation initiatives be grounded in current business objectives with clear and focused priorities [15] [17] [18] [19] [20].

3.2. Infrastructure

Infrastructure for Digital Transformation should support the needs of business units, while promoting effective governance [20]. Wong *et al.* (2019) [21] suggest that adopting a Centre of Practice (CoP) approach enables self-governing practices for Citizen Development.

Table 1. Keyword combinations.

Keywords			
LCNC Development	Citizen Development	Digital Transformation	Critical Success
Alternative Search Terms			
Low-Code	Citizen IT/Embedded IT	Digital	CSFs
Low Code	Citizen Developer	Transformation	Issues
Low-Code Application	Business-Unit IT	Digitalization	Challenges
Low-Code Development	Business-Managed IT	Digital Innovation	Requirements
Platforms			
LCAP	Business-Driven IT		Capabilities
LCDP	User-Driven IT		Implementation
No-Code	Business-Driven Innovation		Barrier
No Code	User Driven Innovation		Success
Low-code no-code	Innovation Communities		
LCNC	Communities of Practice		
	Open Innovation		
Source			
Prinz <i>et al.</i> (2021)	Kopper <i>et al.</i> (2020, 2019)	Hanelt <i>et al.</i> (2020); Osmunden <i>et al.</i> (2018)	Al-Sai <i>et al.</i> (2020)

A key benefit of a CoP is the support for a cross collaboration effort across Technology and the Business. Lee-Kelley and Turner (2016) [22] define a CoP as, “a community designed and implemented as an organizational intervention, utilizing multiple synchronous and asynchronous electronic platforms to enable local, project and organizational peer-to-peer engagement and mutual learning,” (p. 66)

Many definitions assume that CoP’s, “can facilitate effective problem solving, practice improvement and self-renewal” [23] [24] [25].

A CoP can provide autonomy and avoid overcontrol with a light-touch approach. Khanna *et al.* (2020) [20] reinforce this and advocate close collaboration and mutual accountability within a joint business-IT effort—highlighting the importance of designing infrastructure in a way that balances autonomy and the level of leadership guidance. To promote this balance, they suggest leadership define the mission up front and then step back to provide autonomy for teams to figure out how to deliver and implement the initiative.

3.3. Technology

MBO is fortunate to have access to Microsoft’s own Power Platform, which is a strong choice, for delivering Digital Transformation.

There is an additional benefit as MBO is supporting the “dogfooding” of this

technology. Dogfooding tests quality control of product offerings in an Operational Live Environment. This offers opportunities for testimonials of real-world practice, showing the market that Microsoft has confidence in its own product.

3.4. Processes & Procedures

Correct processes and procedures are essential to plan for change, monitor, learn, make decisions quickly and modify in collaboration with stakeholders [17] [18] [19].

Organizations can manage the inherent uncertainty of Digital Transformation by starting small and using a pilot program to evaluate the initiative. This allows enterprises to gain quick wins, identify barriers, get buy in, and gather important feedback prior to scaling and launching formally [17].

Consideration is needed as to ensure ideas and development opportunities are prioritized effectively. Davenport and Redman (2020) [26] recommend prioritizing the problems which are of the greatest need. An alternative is to promote communication and prioritize ideas is through cross-functional or regional teams vetting each other’s applications prior to adoption. This can help Citizen Developers foresee issues while encouraging the sharing of ideas, collaboration and communication across regions, teams, and departments [17].

3.5. Governance

Governance is essential to ensure the development of LCNC applications is compliant within the boundaries of Data Loss Prevention policies established by the enterprise, protecting the enterprise against Shadow IT and data breaches.

Governance is complex requiring a thorough yet flexible strategy open to iteration. Clearly defined governance ensures correct use of resources and effective data security. Ahmed *et al.* (2017) [27] provide four questions for stakeholders to ask when developing their governance framework for Citizen Development see **Table 2**.

Table 2. Key governance questions for stakeholders. Source: [27].

#	Key Governance Questions
1	Who are the Citizen Developers, and how will they be trained?
2	What toolsets should developers use to solve what problems? For instance, it makes sense to choose an LCNC platform so users can openly collaborate.
3	How can we eliminate shadow IT without smothering innovation? One way is to choose tools that meet central organization requirements but foster and encourage problem solving at the point where the problems exist.
4	How can we create and maintain healthy tension between central IT and Citizen Developers? IT should select enterprise-wide platforms such as security, and its core developers should build and maintain core applications. Citizen Developers should leverage the functionality and capability of LCNC to rapidly test, deploy, tweak, or abandon point solutions that may then scale.

Wong *et al.* (2019) [21] have an adaptive governance framework for defining Citizen Developer Safe Zones based on the complexity of the application and the business criticality (Figure 2). This framework can help enterprises determine if the use of Citizen Development is appropriate and the correct level of IT support and governance is applied.

Having clear governance, training, compliance guidelines and accountability, organizations can help address security concerns about Citizen Development. Checkpoints also ensure that output from Citizen Development is quality controlled with the appropriate level of monitoring [28].

3.6. Culture

Culture is shown to impact the outcome of Digital Transformation efforts with 63% of organizations surveyed ranking culture as the biggest challenge to drive forward transformation [19].

Ensuring success requires a culture which promotes collaboration, transparency, adaptability, inclusivity, and community. A culture of support is needed to ensure joint IT and Business Initiatives succeed [29].

The importance of adopting a culture which makes time and supports celebrating learnings, experimentation, and knowledge sharing, encouraging a growth mindset of innovation with openness to change is noted [17] [19] [30].

3.7. People

3.7.1. Leadership and Management

Senior leadership commitment is essential to sustain any type of Digital Transformation, including developing specialized leaders who understand digital and analytical capabilities [16].

Lee-Kelley and Turner (2016) [22] highlight the need for sensitive leadership to avoid the Citizen Developers losing interest as crowd sourced participants, applicable for the MBO Citizen Development Initiative which relies on a crowd source model of resourcing. Volunteers are enlisted from across MBO offering stretch assignments and on the job enrichment.

Talent and Capabilities

Citizen Developers need a combination of the right talent and capabilities to drive success. Davenport and Redman (2020) [26] recommend creating teams with individuals who have previous experience and success executing transformation in the following 4 skills areas shown in Table 3.

3.7.2. Employee Motivation

Motivations for participating in an organizational community are often complex, multi-level and dynamic [17] [22]. Members should be empowered through clear roles, responsibilities, and a shared sense of accountability [16].

The setting up and structuring of a CoP is intrinsic in the motivation and participation of members—it is a chance for CoP members to develop an identity, contribute, broaden networks and to connect and develop ideas with others [31].

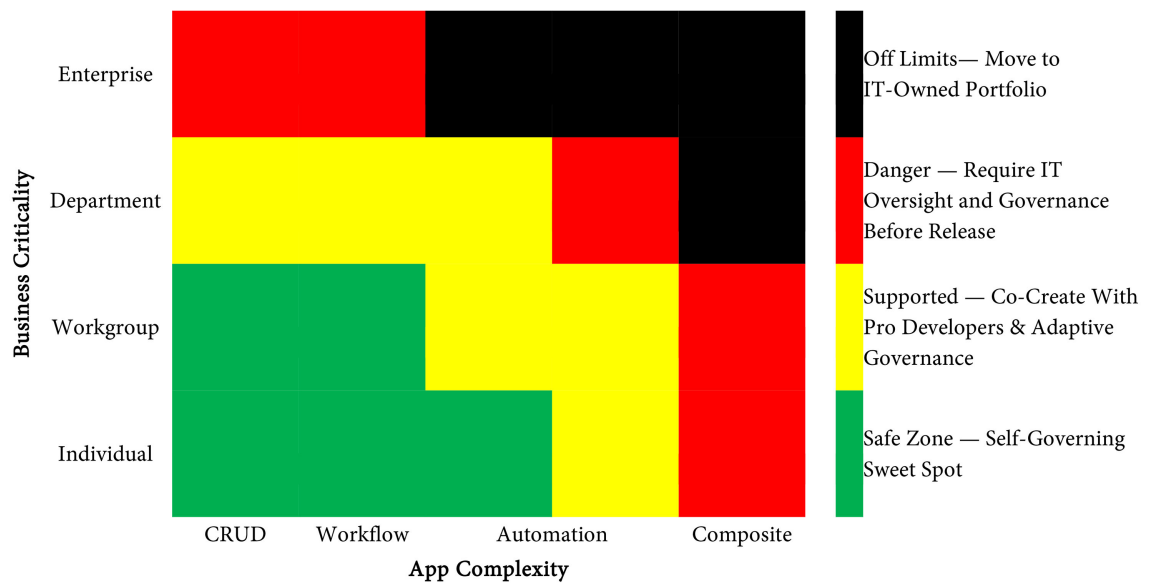


Figure 2. Adaptive governance framework for defining citizen developer safe zones Source: [21].

Table 3. 4 Key talent areas for digital transformation after [26].

Talent	Skills
Technology	Technological Depth and Breadth; Ability to work with the business; Leaders who have strategic sense and are strong communicators.
Data	Data Depth and Breadth; Ability to convince people to adopt new data customer/creator roles
Process People	End-to-end mindset: Ability to align silos and to assess what is needed— incremental process improvement or radical process reengineering?
Organizational Change	“Leadership, teamwork, courage, emotional intelligence...change management”

Other determinants of motivation include

- the opportunity to showcase personal competence [22] [31] [32]
- autonomy and the opportunity for personal recognition [22] [31] [33]
- networking across the organization, creates a positive motivation impact through contribution of ideas and enhanced reputation [17] [22] [31].

3.7.3. Knowledge, Learning and Social Capital

Knowledge Retention and the growth of expertise is important in motivating and sustaining participation in a community. [17] [31]. Lee-Kelley and Turner (2016) [22] found that as CoP’s evolve, so does the knowledge share amongst the community—from tactical and informational only to strategic leading to informed choices. This demonstrates a virtuous cycle of knowledge sharing in which members actively seek to learn more about the broader organization.

Learning encourages self-selection within communities. Wendelken *et al.* (2014) [31] found that required learning within an organizational community helps to ensure members were limited to individuals who were genuinely interested in

learning about the topic.

3.8. Goals & Metrics

Perception leads to a high degree of subjectivity in determining success. However, organizations that have measurable business outcomes report that their results surpassed expectations 1.7 times greater than those who did not [16].

Financial metrics are impractical as a measure of the performance of a CoP and metrics such as increased employee engagement, increased customer satisfaction and internal process improvement should be used instead [22].

Carroll *et al.* (2020) [34] however take a differing view, taking a Return on Investment (ROI) approach to balance resources while enabling lean IT and sustained operational effectiveness.

Key Performance Indicators (KPI's) provide the best measures of success, including

- customer loyalty.
- operational efficiency.
- growth/revenue [19].

Table 4 summarizes the different metrics and goals suggested within the literature.

Table 4. Summary of suggested Metrics and KPI's within the Literature.

#	Metric	Reference
1	Customer Loyalty/Satisfaction	Walker (2020); Dahl <i>et al.</i> (2011)
2	Operational Efficiency/Time Savings	Walker (2020); Dahl <i>et al.</i> (2011)
3	Growth/Revenue Generation	Walker (2020)
4	Market Position vs Competitors	Walker (2020)
5	Employee Satisfaction/Engagement	Walker (2020); Lee-Kelley and Turner (2016); Dahl <i>et al.</i> (2011)
6	Number of ideas sponsored	Dahl <i>et al.</i> (2011)
7	Timeframe to realize value	Dahl <i>et al.</i> (2011)
8	Cultural Change	Walker (2020)
9	Profitability	Walker (2020); Dahl <i>et al.</i> (2011)
10	Attendance	Lee-Kelley and Turner (2016)
11	Members	Lee-Kelley and Turner (2016)
12	Participation	Lee-Kelley and Turner (2016)
13	Outputs	Lee-Kelley and Turner (2016)
14	Reusability	Carroll <i>et al.</i> (2020)
15	Scalability	Carroll <i>et al.</i> (2020)
16	Total Cost of Ownership	Carroll <i>et al.</i> (2020)
17	Potential Risks	Carroll <i>et al.</i> (2020)
18	ROI	Carroll <i>et al.</i> (2020)

3.9. Conceptual Framework of Categories from Literature Review

The authors developed a conceptual framework from the literature review above. Eight main categories of concepts identified are shown in **Figure 3**, illustrating the clustering and relationships between categories from the literature (after [14]).

4. Research Methodology

Freund (1988) [35] recommends a top-down approach to ensure the selected critical success factors are appropriate to the business objectives. Eighteen potential measures of success identified from the literature review (**Table 4**) were reviewed with two senior leaders within MBO, who then identified 6 factors of significant importance for the successful deployment of LCNC within their organisation. These were subsequently treated as the 6 Critical Success Factors.

- Operational Efficiency
- Time Savings
- Timeframe to Realize Value
- Participation
- Employee Engagement
- Number of Sponsored Ideas.

These 6 Critical Success Factors align to the overall objectives of the MBO Citizen Development effort—the need to develop better applications, faster, against a backdrop of software developer shortages.

These six CSFs are used to understand output in terms of importance and performance through surveying end users of these LCNC Digital Transformation techniques.

A brief definition of each of the 6 Critical Success Measures follows.

4.1. Operational Efficiency

Operational efficiency enables organizations to be more agile, leaner, and profitable through the efficient allocation of resources. This could involve optimizing people, processes, and inventory to reduce waste [36]. Citizen Development can boost productivity and operational efficiency across organizations by providing end-users with the tools and capabilities to innovate, address pain points, automate processes, and design solutions to drive forward Digital Transformation [37].

For MBO, Operational Efficiency was highlighted as particularly important in aligning these goals, and in helping to translate the benefits to senior sponsors within the wider organization.

4.2. Time Savings

The dictionary definition for timesaving is, “making it possible to do something quickly: causing something to happen or end faster” [38]. This Critical Success Factor refers to the automations of operational processes reducing time spent on

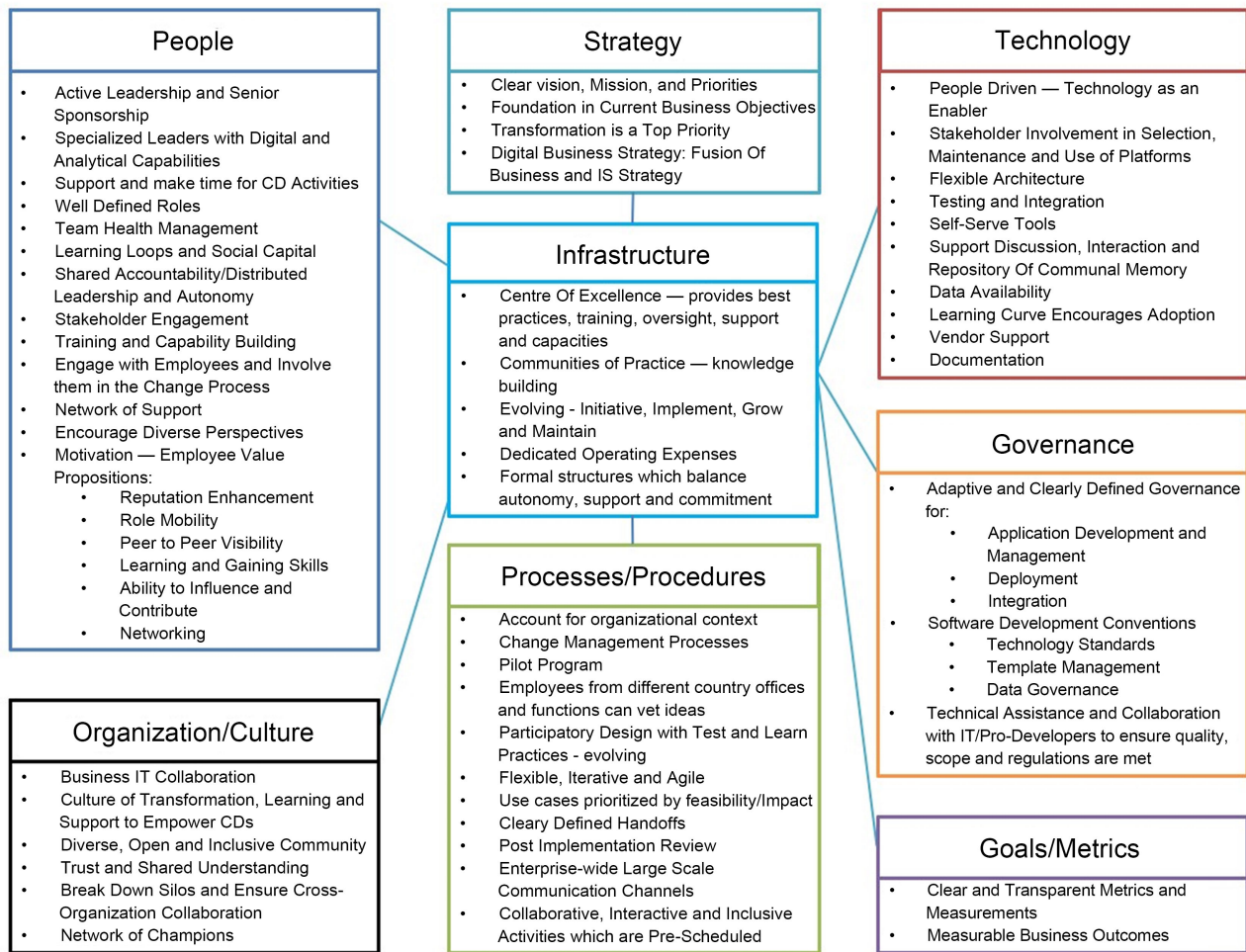


Figure 3. Proposed framework of success factors for citizen development (after [14]).

manual tasks. This is important for reporting on success, as it quantifies the benefits to senior leadership.

4.3. Timeframe to Realize Value

Timeframe to realize value addresses some of the challenges with measuring time savings, as time savings may not occur immediately as there may be a delay in operationalising new processes, tools and capabilities before the benefits are realized. Dahl *et al.* (2011) [17] discusses the importance of monitoring the time horizon for realizing the value of opportunities and proposes an approach which measures the value over the near term (0 - 2 years) and the long term (2+ years).

For MBO, the faster value can be realized the better to help build momentum and ensure benefits are reaching end-users within the department. Speed is a key benefit of using LNC tools which attracted MBO to deploying Citizen Development across the wider enterprise, and so ensuring this benefit is being realized is important. Through monitoring this measure, MBO can ensure they are prioritizing the right projects that balance the potential time savings with the expected timeframe to realize these benefits.

4.4. Employee Engagement

Employee engagement is the heightened emotional and mental connection an employee feels towards their workplace or organization, and can promote business success and longevity through engaged employees demonstrating high levels of energy, motivation, and enthusiasm [39].

Highly Engaged Employees in Citizen Development for MBO are more likely to participate in the community and bring motivation and enthusiasm to the completion and success of LCNC projects. As employees develop their skills, they are essential for developing more LCNC applications and educating new participants to the Citizen Developer Community.

4.5. Participation

Lee-Kelley and Turner (2016) [22] discuss participation as an outcome and performance metric for CoP's. The importance of participation as a social interaction is central to creating a cohesive and effective community which can develop innovative solutions—something which is important for MBO. MBO set up the Citizen Development Initiative to address the shortfall in available software developers to support application development. Without empowering and motivating employees to participate, it will be impossible to realize this benefit [40].

4.6. Number of Sponsored Ideas

Measuring the number of sponsored ideas is a way of assessing the importance and impact of the Citizen Development Initiative to the MBO Leadership. “Number of ideas” and “number of ideas adopted” can also be considered as key measures of success for an innovation community [17].

For MBO this metric indicates Leadership engagement with the initiative, ensuring there is motivation to participate and submit ideas.

5. Data Gathering

5.1. Selection of Primary Data

Primary data is collected for a specific purpose of the research, whereas secondary data involves data from sources which already exist and were originally collected for another research purpose [41]. To understand the specific needs of MBO, primary data was deemed the best option as it provides a first-hand and unfiltered view which fits the information needs of this study. It provides an up-to-date and current view of the needs and context of MBO which cannot necessarily be captured with secondary sources.

Data was gathered from global teams across MBO and IT, focusing specifically on three main groups

- MBO Citizen Developers
- Regional Operating Centre (ROC) Business Intelligence team
- Global Business Process and Analytics team.

These groups were selected in partnership with Microsoft for this project as

these will be the main groups involved in and impacted by the initiative. These groups were contacted by email with a direct link to the online survey. 30 responses were collected over a two-week period.

5.2. Survey Sampling Size

Determining an appropriate sample size is vital in drawing realistic conclusions from research findings [42]. The larger the sample size used, the more representative and precise the results can be. Greener and Martelli, (2012) [43] found that the minimum size of sample for any one category of data should be 30, as this is likely to offer a reasonable chance of normal distribution.

5.3. Quantitative Research Design and Limitations

Quantitative data was collected using a structured online questionnaire via Microsoft Forms. Most of the questions were pre-coded to help quantify the proposed factors. Pre-coded approaches also provide the opportunity to compare experiences and views of multiple people.

The Quantitative research used a cross-sectional design to collect data at a specific point in time [44]. These types of studies can often be conducted quickly and inexpensively but can have some weaknesses of cross-sectional research as it can be subject to biases including sampling, nonresponse and recall bias [45]. Given the short time frame available for this research, and the want to capture up to date and relevant information for Microsoft to action, a cross-sectional study was chosen.

The online survey was kept short enough to encourage responses [46]. Clear answering instructions were provided, and the survey was carefully designed to account for the context of the questions, with consideration of the wording, response scales and techniques used to try minimizing biases, variation and produce better quality data [47].

Scale data was collected using a four-point Likert scale originally proposed in [48]. For measuring importance, this scale included “extremely important,” “important” slightly important” and “not important”. For measuring performance, the scale included “excellent,” “good,” “fair,” and “poor.” In both instances a category of “no basis for judgement” was also provided where respondents may not have encountered certain measures.

The online survey questions can be found in the **Appendix A**. The following section discusses the use of the Importance-Performance matrix.

6. Assessing the Importance and Performance Measurements of Critical Success Factors

Martilla and James (1977) [48] developed an Importance-Performance analysis technique used to develop marketing initiatives. The technique addresses the challenge being faced by organizations in turning research results into operational actions. This low-cost analysis method separates factors into four sections (**Figure 4**).

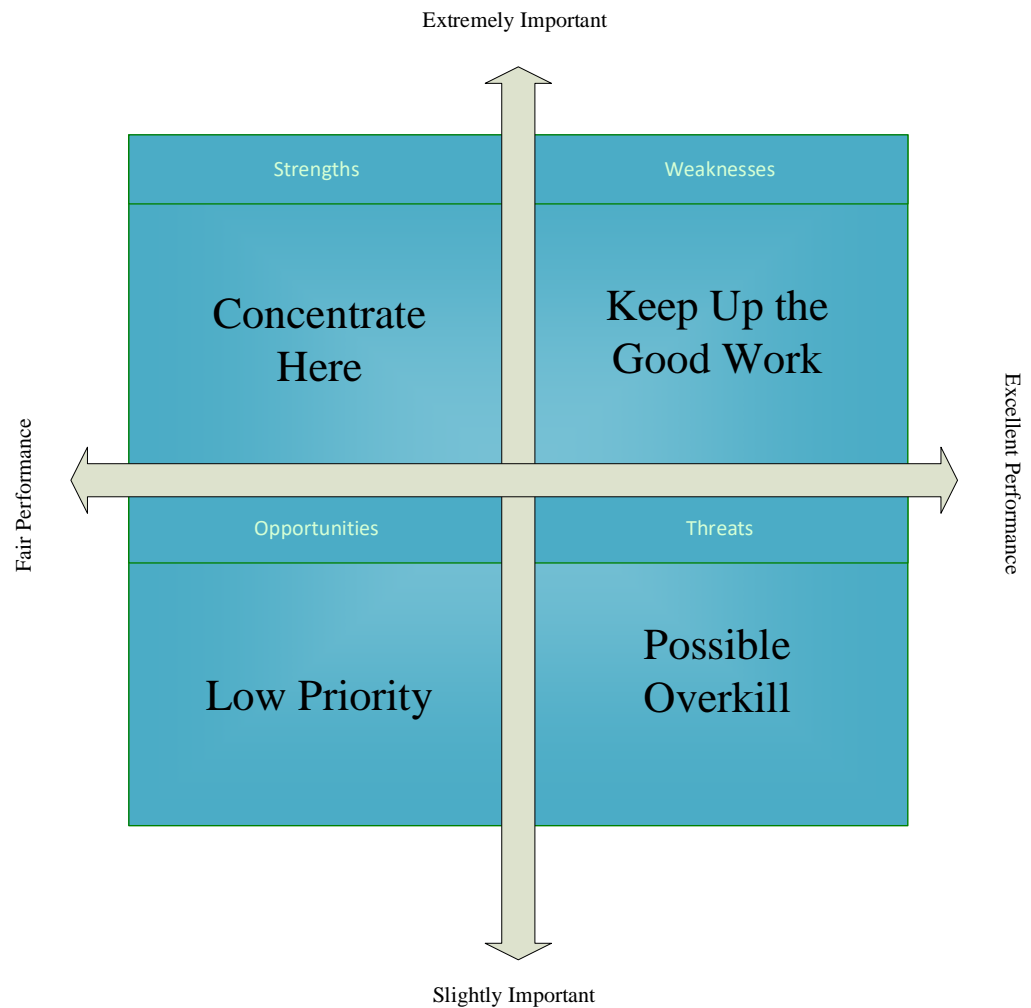


Figure 4. Importance-Performance grid after [48].

Slack (1994) [49] adapted this matrix as a determinant of improvement priority within organizations for their operations strategy (Figure 5). Slack (1994) [49] can be applied to the survey results received when looking at areas to focus on when executing a successful Citizen Development strategy.

6.1. Survey Overview and Demographics

The survey focused on the implications of the six identified Measures of Success to the end-users of Citizen Development. The survey was a deep dive into the importance and performance of the six Critical Success measures selected. Participants from MBO Citizen Developers, Regional Operating Centre (ROC) Business Intelligence team, and Global Business Process and Analytics team were selected as the target demographic for the online survey. Full details of survey responses can be found in the Appendix (Table B2 and Table B3).

30 responses were from three locations of activity for MBO—the USA, Ireland, and Singapore. For full respondent demographics see Table B1 in the appendix.

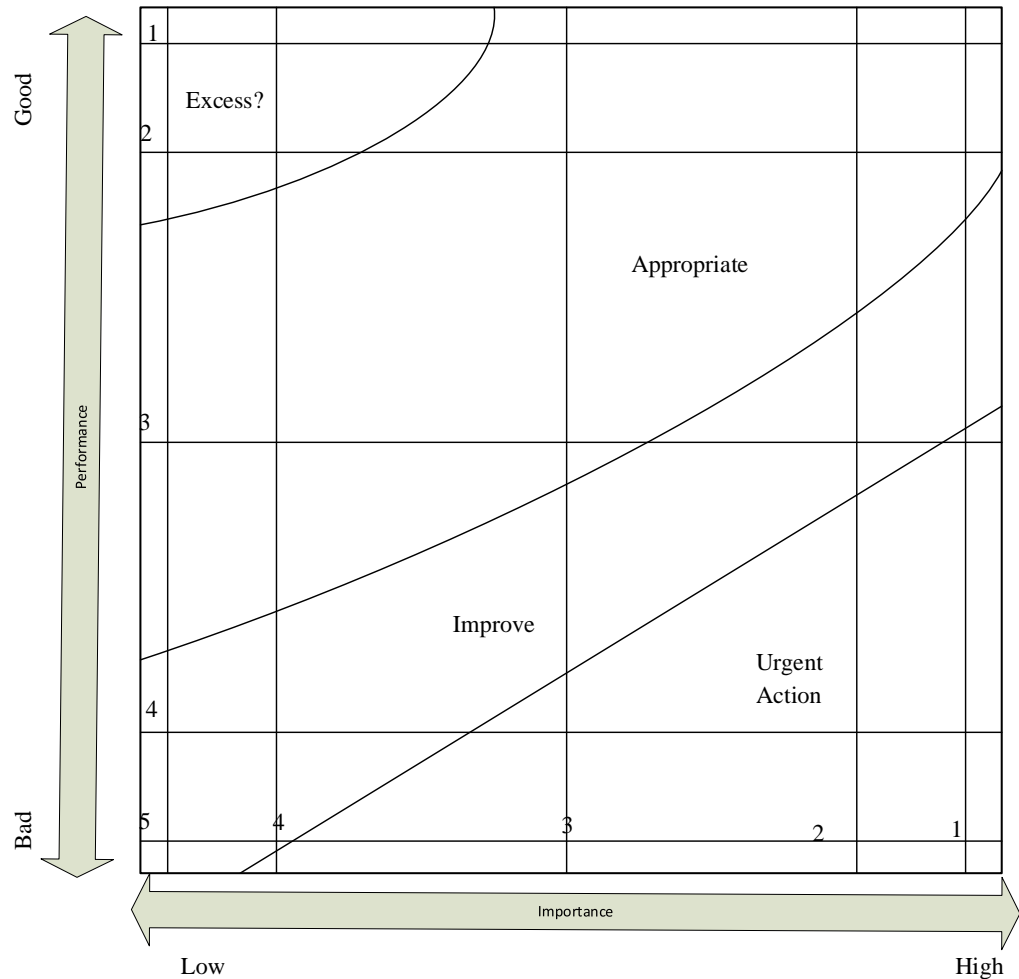


Figure 5. Importance-Performance matrix using performance scales, [49].

77% of respondents have prior experience with IT projects, and 67% of respondents have previous experience with Citizen Development (**Figure 6**). The experience across these combined individuals has seen involvement in over 400 IT projects and 180 Citizen Developer Initiatives. The combined experience at Microsoft across all the respondents was over 180 years, which varied significantly across respondents from just a few months to 25 years.

6.2. Survey Results and Discussion

Each of the 30 survey respondents rated the six Critical Success Factors for performance and for importance respectively.

- 40 ratings (approx. 11%) received a response of “no basis for judgement.”
- 60% of these “no basis for judgement” ratings came from employees with 1 or less years’ work experience at Microsoft.

These responses were removed, and the remaining results have been summarised in **Figure 7** and **Figure 8**. Full survey results, including importance and performance ratings by respondent can be found in **Table B2** and **Table B3** of the Appendix.

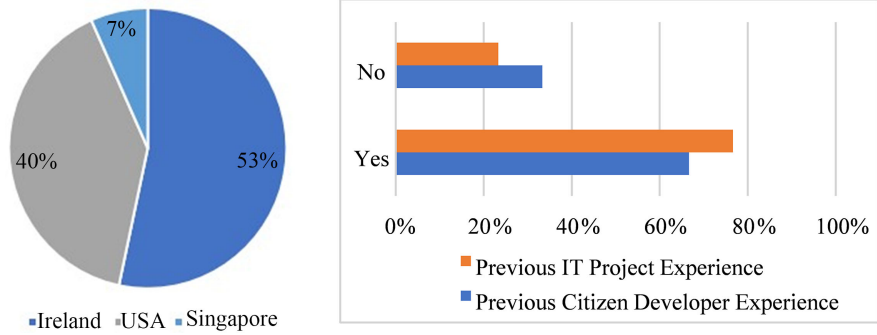


Figure 6. Location of respondents with experience assessments.

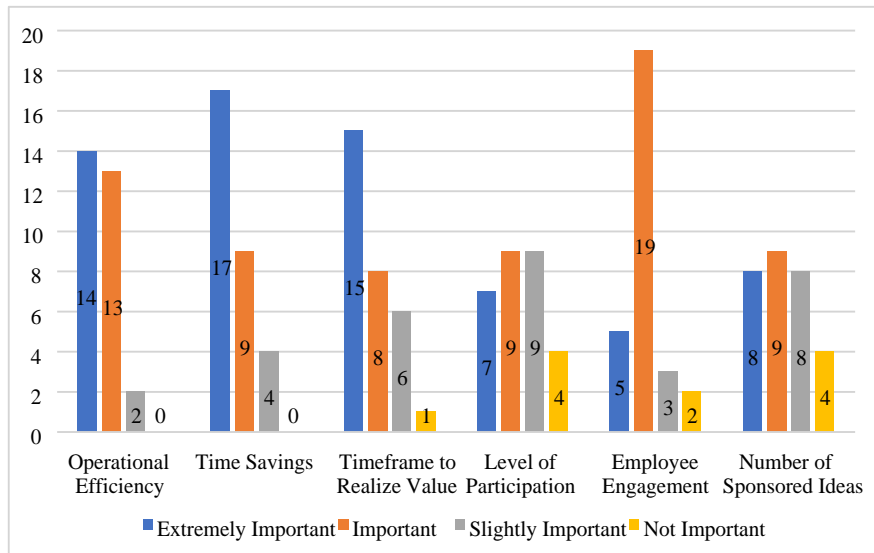


Figure 7. Survey Results—Importance Ratings.

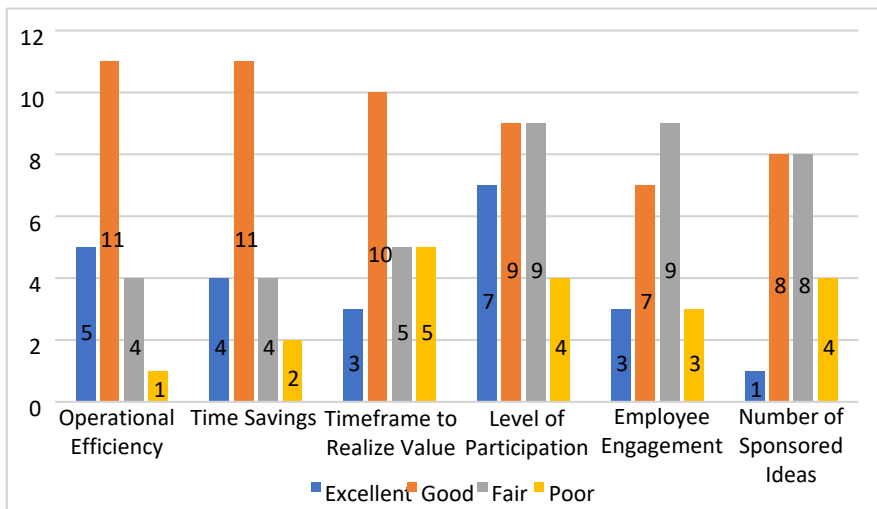


Figure 8. Survey Results—Performance Ratings.

Importance-performance analysis for this research selected the two-dimensional models discussed in Figure 4 and Figure 5 to apply the findings of this paper.

To interpret these results, the mean importance and performance rating was calculated. Each rating was quantified using the numerical scale shown in **Table 5**. This is the approach taken in developing the importance-performance matrix in [48].

Mean importance and performance ratings of each Critical Success Factor is shown in **Table 6**.

6.3. Importance-Performance Analysis

The mean importance and performance ratings from **Table 5** and **Table 6** were plotted on an Importance-Performance Matrix (**Figure 9**). This matrix provides an easily understood visual which can help identify where organisations should focus, or defocus time and resources [48].

Insight comes from the relative positioning of the factors, rather than absolute levels of performance and importance. Looking closely at the responses received for measuring the importance of the six Critical Success Factors, 76% of responses were Extremely Important or Important, with Extremely Important representing the mode as the most frequent response.

Table 5. Importance and performance priority scale.

Importance Rating					
Response	Extremely Important	Important	Slightly Important	Not Important	No Basis for Judgement
Rating	4	3	2	1	N/A—Removed
Performance Rating					
Response	Excellent	Good	Fair	Poor	No Basis for Judgement
Rating	4	3	2	1	N/A—Removed

Table 6. Mean importance and performance rating.

Attribute #	Attribute Description	Mean Importance Rating (4.d.p)	Mean Performance Rating (4.d.p)
1	Operational Efficiency	3.4138	2.9524
2	Time Savings	3.4333	2.8095
3	Timeframe to Realize Value	3.2333	2.4783
4	Level of Participation	2.6552	2.6552
5	Employee Engagement	2.9310	2.4545
6	Number of Sponsored Ideas	2.7241	2.2857
	Median	3.0822	2.5667

For responses received for measuring the performance, 58% of responses were excellent and good, with good representing the mode in this instance. Given this, centring the x-y intersection on 1.5 (the mid-point between the highest and lowest possible rating) would have resulted in little differentiation between the Critical Success Factor. Martilla and James (1977) [48] propose using the median value as a useful division of the matrix to better illustrate these relative levels. The results from the survey are plotted on this matrix (Figure 9).

Timeframe to Realize Value falls within “Concentrate Here”, the quadrant where concentrating actions to produce the maximum results is recommended [48]. This aligns to being one of the most important Critical Success Factors found in the literature review that gaining quick wins was an important part of Citizen Developer initiatives [17] [50].

Increased operational efficiency and Time Savings were ranked as both important and well performing, so these are areas which the MBO Citizen Development Initiative can keep up the good work.

Ensuring a satisfactory level of participation had the lowest level of importance, and yet was rated with the third highest performance rating and as such falls within the “Possible Overkill” quadrant, suggesting that this area requires

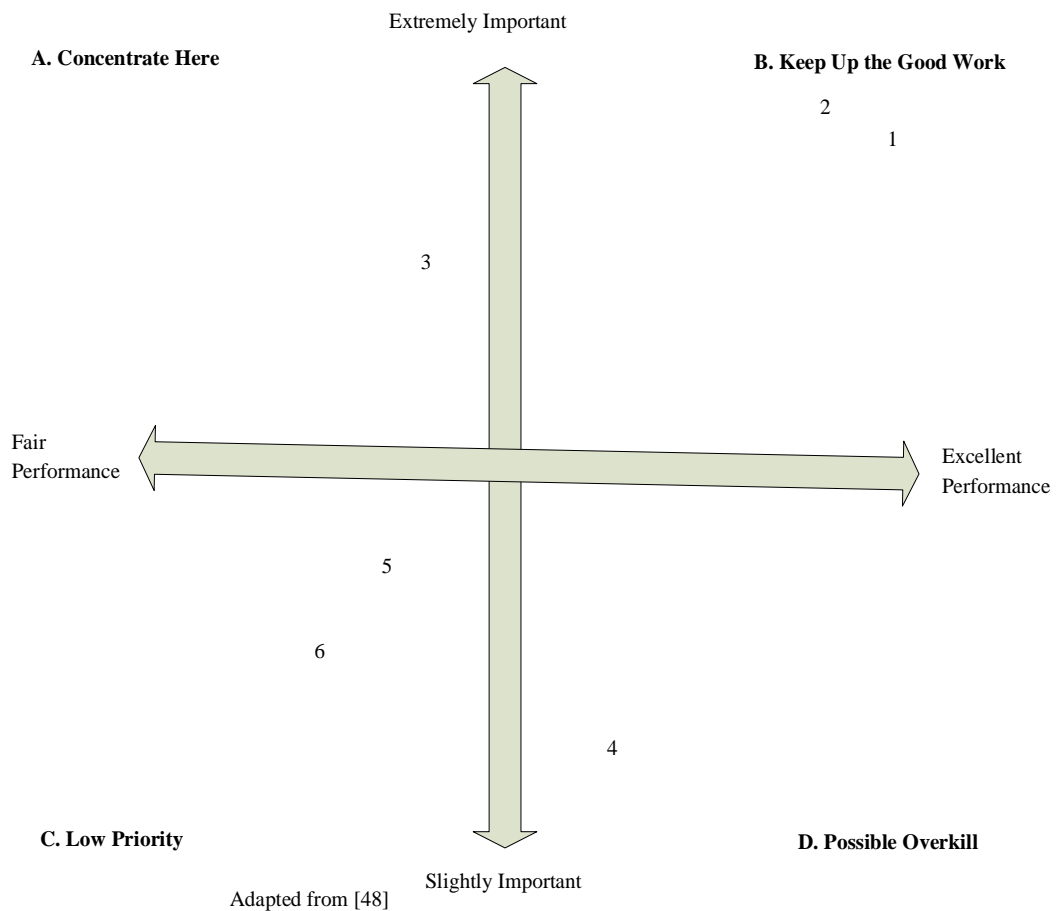


Figure 9. Importance and performance matrix (Adapted from [48]).

less focus. MBO could continue ensuring the right people are in the right roles within the initiative.

Increased employee engagement and high number of sponsored ideas were ranked as “Low Priority” from the survey. These two Critical Success Measures had the lowest mean performance ratings, therefore they are not a priority for improvement.

Slack (1994) [49] provides an alternative zoning method for setting group priorities which separates attributes into four sections

- the appropriate zone
- the improve zone
- the urgent action zones
- the excess zone.

Each Critical Success Measure has been plotted within Slack’s alternative Importance-Performance Matrix as illustrated in **Figure 10** [49].

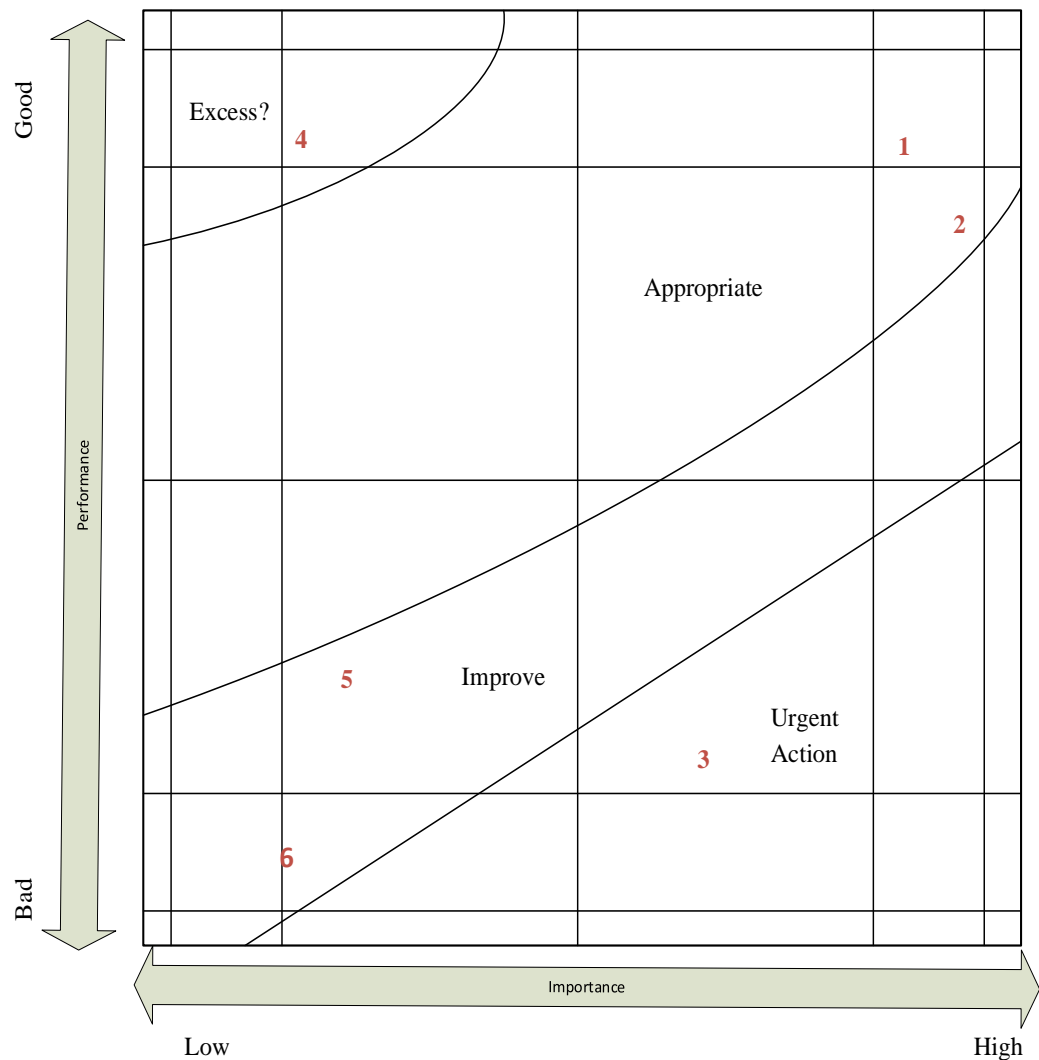


Figure 10. Importance-Performance matrix [49].

Table 7. Summary of priority zones (Adapted from: [49]).

Zones	Corresponding Zone's from [49]	Suggested Action	Measure of Success
Appropriate	Keep Up the Good Work	Satisfactory in short medium term, in the long-term organizations may want to increase performance to the upper boundary.	<ul style="list-style-type: none"> • Operational Efficiency-1 • Time Savings-2
Improve	Low Priority	Candidates for improvement, factors which are lower priority (at the bottom left-hand corner) are non-urgent cases that need improving, but not as a priority.	<ul style="list-style-type: none"> • Employee Engagement-5 • Number of Sponsored Ideas-6
Urgent Action	Concentrate Here	Objectives should be to improve these factors.	<ul style="list-style-type: none"> • Timeframe to Realize Value-3
Excess	Possible Overkill	Check if resources could be diverted to another factor which needs improvement.	<ul style="list-style-type: none"> • Level of Participation-4

The results are similar to those found in the Martilla and James (1977) matrix (Figure 9) [48]. For each zone in the matrix shown in Figure 10, Slack proposes the actions that organizations should take as summarized in Table 7 [49]. This is a useful starting point to prioritize potential actions for each Critical Success Factor. MBO can then verify this framework in line with their other provisions to help ensure success of the Citizen Developer initiative.

7. Conclusions and Recommendations

This paper has attempted to identify Critical Success Factors for Citizen Development efforts in Digital Transformation.

Eight key categories were identified from the literature, within each of these categories, specific recommendations were identified for how organizations can approach Citizen Development. Having a centralized team to support Citizen Developers can enable successful Digital Transformation, as a CoP [Centre of Practice].

A conceptual framework (Figure 3) was developed and used as a catalyst for narrowing down the literature into Six Critical Success Factors.

The Six Critical Success Factors were used in a survey of the end users of the MBO Citizen Development Initiative. The survey was used to highlight importance and performance gaps between these Critical Success Factors and MBO Citizen Development Initiatives performance.

Importance and performance comparisons which allow gaps to be identified is a useful method of formulating operations strategy and in determining which improvements are a priority [49].

The findings of this paper are that MBO Citizen Development Initiative should be applied to improving “timeframe to realize value”, on “Operational Efficiency-

cy”, and on “Time Savings” to deliver success.

Final Remarks

A consistent theme throughout is that there is no one-size-fits all approach as organizational context plays a crucial role in Digital Transformation. Any structures, processes or best practices should be agile, adaptable, and open to feedback and MBO should refine and test strategies over time to ensure Citizen Development is sustainable and successful.

This exploratory research aimed to provide a broad view into Critical Success Factors of within the MBO Citizen Development Initiative and areas to be prioritized. It is useful groundwork for future research and learning.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Gartner (2021) The Importance of Citizen Development and Citizen IT. <https://www.gartner.com/en/newsroom/press-releases/2021-02-15-gartner-forecasts-worldwide-low-code-development-technologies-market-to-grow-23-percent-in-2021>
- [2] Lehmann, C. (2021) Automation and Integration in Hybrid IT Architecture: 2018 Research Agenda. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1117&context=ecis2021_rp
- [3] Kelly, C., *et al.* (2021) The Low-Code/No-Code Revolution Promises to Ignite a ‘Cambrian’ Explosion of User-Generated Innovation. <https://www.accenture.com/gb-en/insights/software-platforms/power-to-the-people>
- [4] Dahlander, L. and Wallin, M. (2021) Why Now Is the Time for “Open Innovation”. <https://hbr.org/2020/06/why-now-is-the-time-for-open-innovation>
- [5] Harvard Business Review (2021) The New Decision Makers: Equipping Frontline Workers for Success. <https://www.thoughtspot.com/sites/default/files/pdf/HBR-ThoughtSpot-The-New-Decision-Makers.pdf>
- [6] PMI (2021) Introducing PMI Citizen Developer. https://www.google.com/search?q=pmi+citizen+developer+course&rlz=1C1CHBF_en-GBGB929GB929&oq=pmi+citizen+developer+course&aqs=chrome..69i57.3128j0j4&sourceid=chrome&ie=UTF-8
- [7] Rymer, J., *et al.* (2017) How to Harness Citizen Developers to Expand Your AD&D Capacity. Forrester.
- [8] Financial Times (2021) This Is for Everyone: Low-Code and the New Wave of Digital Transformation. <https://www.ft.com/partnercontent/servicenow/this-is-for-everyone-low-code-and-the-new-wave-of-digital-transformation.html>
- [9] Shapiro, D. and Kirkman, B. (2021) It’s Time to Make Business School Research More Relevant. <https://hbr.org/2018/07/its-timehttps://hbr.org/2018/07/its-time-to-make-business-school-research-more-relevant>

- [10] Henriette, E., Feki, M. and Boughzala, I. (2015) The Shape of Digital Transformation: A Systematic Literature Review. *Mediterranean Conference on Information Systems 2015 Proceedings*, Samos, 3-5 October 2015, 10.
- [11] Krejci, D., Satu, I. and Stéphanie, M. (2021) Innovating with Employees: An Exploratory Study of Idea Development on Low-Code Development Platforms. *European Conference on Information Systems 2021 Research Papers*, Marrakech, 14-16 June 2021, 118.
- [12] Hanelt, A., Bohnsack, R., Marz, D. and Marante, C.A. (2020) A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change. *Journal of Management Studies*, **58**, 1159-1197. <https://doi.org/10.1111/joms.12639>
- [13] Osmundsen, K., Iden, J. and Bygstad, B. (2018) Digital Transformation Drivers, Success Factors, and Implications. *Mediterranean Conference on Information Systems 2018 Proceedings*, Corfu, 28-30 September 2018, 37.
- [14] Al-Sai, Z.A., Abdullah, R. and Husin, M.H. (2020) Critical Success Factors for Big Data: A Systematic Literature Review. *IEEE Access*, **8**, 118940-118956. <https://doi.org/10.1109/ACCESS.2020.3005461>
- [15] Pisano, G. (2015) You Need an Innovation Strategy. *Harvard Business Review*, **93**, 4454.
- [16] Bughin, J., *et al.* (2021) Digital Transformation: Improving the Odds of Success. <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20transformation%20Improving%20the%20odds%20of%20success/Digital-transformation-Improving-the-odds-of-success-final.pdf>
- [17] Dahl, A., Lawrence, J. and Pierce, J. (2011) Building an Innovation Community. *Research- Technology Management*, **54**, 19-27. <https://doi.org/10.5437/08956308X5405006>
- [18] Tabrizi, B., *et al.* (2021) Digital Transformation Is Not about Technology. <https://hbr.org/2019/03/digital-transformation-is-not-about-technology>
- [19] Walker, M. (2021) Rethinking Digital Transformation. <https://hbr.org/sponsored/2020/03/rethinking-digital-transformation>
- [20] Khanna, S., *et al.* (2021) Welcome to the Digital Factory: The Answer to How to Scale your Digital Transformation. <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/welcome-to-the-digital-factory-the-answer-to-how-to-scale-your-digital-transformation>
- [21] Wong, J., *et al.* (2019) The Future of Apps Must Include Citizen Development. Gartner, Stamford.
- [22] Lee-Kelley, L. and Turner, N. (2016) PMO Managers' Self-Determined Participation in a Purposeful Virtual Community-of-Practice. *International Journal of Project Management*, **35**, 64-77. <https://doi.org/10.1016/j.ijproman.2016.09.014>
- [23] Wenger, E. (1998) *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press, Cambridge. <https://doi.org/10.1017/CBO9780511803932>
- [24] Wenger, E. and Snyder, W. (2000) Communities of Practice: The Organizational Frontier. *Harvard Business Review*, **78**, 139-145.
- [25] Wenger, E., McDermott, R.A. and Snyder, W.M. (2002) *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Harvard Business Press, Boston.
- [26] Davenport, T. and Redman, T. (2021) Digital Transformation Comes Down to Talent in 4 Key Areas. <https://hbr.org/2020/05/digital-transformation-comes-down-to-talent-in-4-key-areas>

- [27] Ahmed, K., *et al.* (2021) How Can IT Empower Citizen Developers? <https://a.sfdcstatic.com/content/dam/www/ocms/assets/pdf/platform/governing-low-code-white-paper.pdf>
- [28] Hunt, S., *et al.* (2021) Governing Citizen Development: A Strategy Guide for CIOs and IT Departments. <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE4GSjX>
- [29] Haffke, I., *et al.* (2017) The Transformative Role of Bimodal IT in an Era of Digital Business. *Proceedings of the 50th Hawaii International Conference on System Sciences*, Hawaii, 4-7 January 2017, 5460-5469. <https://doi.org/10.24251/HICSS.2017.660>
- [30] Hartl, E. and Hess, T. (2021) The Role of Cultural Values for Digital Transformation: Insights from a Delphi Study. *Proceedings of the 23rd Americas Conference on Information Systems*, Boston, 10-12 August 2017, 1-10. https://www.researchgate.net/publication/330353915_The_Role_of_Cultural_Values_for_Digital_Transformation_Insights_from_a_Delphi_Study
- [31] Wendelken, A., *et al.* (2014) Innovation without Me: Why Employees Do (Not) Participate in Organizational Innovation Communities. *R&D Management*, **44**, 217-236. <https://doi.org/10.1111/radm.12042>
- [32] Janzik, L. and Raasch, C. (2011) Online Communities in Mature Markets: Why Join, Why Innovate, Why Share? *International Journal of Innovation Management*, **15**, 797-836. <https://doi.org/10.1142/S1363919611003568>
- [33] Muhdi, L. and Boutellier, R. (2011) Motivational Factors Affecting Participation and Contribution of Members in Two Different Swiss Innovation Communities. *International Journal of Innovation Management*, **15**, 543-562. <https://doi.org/10.1142/S1363919611003477>
- [34] Carroll, N., *et al.* (2021) The Importance of Citizen Development for Digital Transformation. *Cutter Business Technology Journal*, **34**, 5-9.
- [35] Freund, Y.P. (1988) Critical Success Factors. *Planning Review*, **16**, 20-23. <https://doi.org/10.1108/eb054225>
- [36] BDC (2021) What Is Operational Efficiency? <https://www.bdc.ca/en/articles-tools/operations/operational-efficiency/3-critical-factors-operational-efficiency>
- [37] Waxer, C. (2021) What is Citizen Development? <https://www.forbes.com/sites/pmi/2020/12/01/what-is-citizen-development-the-low-code-no-code-revolution-organizations-should-go-all-in-on/?sh=371a2ee31da9>
- [38] Merriam-Webster Dictionary (2021) Time-Saving. <https://www.merriam-webster.com/dictionary/time-saving>
- [39] Peart, N. (2021) Making Work Less Stressful and More Engaging for Your Employees. <https://hbr.org/2019/11/making-work-less-stressful-and-more-engaging-for-your-employees>
- [40] McGaughy, C., Sousa, D., *et al.* (2021) Citizen Development: Critical Success Factors for Implementing Low Code/No-Code Enterprise Applications. <https://www.projectmanagement.com/blog/blogPostingView.cfm?blogPostingID=68606&thisPageURL=/blog-post/68606/Citizen-development--Critical-Success-Factors-for-Implementing-Low-Code-No-Code-Enterprise-Applications->
- [41] Salkind, N.J. (2010) *Encyclopaedia of Research Design*. Sage Publications, Thousand Oaks. <https://doi.org/10.4135/9781412961288>
- [42] Memon, M.A., Ting, H., Cheah, J.-H., Chuah, R.T.F. and Cham, T.H. (2020) Sample Size for Survey Research: Review and Recommendations. *Journal of Applied Struc-*

- tural Equation Modeling*, **4**, 1-10. [https://doi.org/10.47263/IASEM.4\(2\)01](https://doi.org/10.47263/IASEM.4(2)01)
- [43] Greener, S. and Martelli, J. (2012) An Introduction to Business Research Methods. 3rd Edition, Ventus Publishing, Telluride.
- [44] Lavrakas, P.J. (2008) Encyclopaedia of Survey Research Methods. Sage Publications, Thousand Oaks. <https://doi.org/10.4135/9781412963947>
- [45] Wang, X. and Cheng, Z. (2020) Cross-Sectional Studies: Strengths, Weaknesses and Recommendations. *Chest*, **158**, S65-S71. <https://doi.org/10.1016/j.chest.2020.03.012>
- [46] Evans, J. and Mathur, A. (2005) The Value of Online Surveys. *Internet Research*, **15**, 195-219. <https://doi.org/10.1108/10662240510590360>
- [47] Scherpenzeel, A. and Saris, W. (1997) The Validity and Reliability of Survey Questions: A Meta-Analysis of MTMM Studies. *Sociological Methods & Research*, **25**, 341-383. <https://doi.org/10.1177/0049124197025003004>
- [48] Martilla, J. and James, J. (1977) Importance-Performance Analysis. *Journal of Marketing*, **41**, 77-79. <https://doi.org/10.1177/002224297704100112>
- [49] Slack, N. (1994) The Importance-Performance Matrix as a Determinant of Improvement Priority. *International Journal of Operations & Production Management*, **14**, 59-75. <https://doi.org/10.1108/01443579410056803>
- [50] Catlin, T., *et al.* (2021) A Roadmap for a Digital Transformation. <https://www.mckinsey.com/industries/financial-services/our-insights/a-roadmap-for-a-digital-transformation>

Appendix

Appendix A. Survey

What does Success Look Like for Citizen Development in Microsoft Business Operations?

This survey will help inform deployment of a Citizen Development Initiative within Microsoft Business Operations. Participating in this survey is voluntary and any presentation of the survey data will be anonymized. This survey will take approximately 5 minutes to complete.

* Required

Demographic Questions

1. Location *

2. Role Title *

3. Department *

4. Years at Microsoft *

5. Do you have previous experience with Citizen Development or Low Code/No Code Development? *

Yes

No

6. If yes, how many Citizen Developer or Low Code/No code Development projects have you worked on?

7. Do you have previous experience with IT Projects? *

Yes

No

8. If yes, how many IT projects have you worked on?

Measures of Success for Citizen Development

Measuring success is an important factor to ensure Citizen Developer Initiatives translate into realized benefits for end users. Six measures of success have been identified as important for Citizen Development initiatives within Microsoft Business Operations. Please rate these measures of success.

9. How important are the following metrics as measures of success for Citizen Development? *

	Extremely Important	Important	Slightly Important	Not important	No basis for judgement
Increased Operational Efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time Savings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short Timeframe to Realize Value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Level of Participation, e.g. Event Attendance/Number of members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased Employee Engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Number of Sponsored Ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. How well have Microsoft Business Operations recent initiatives performed in delivering these benefits for end users? *

	Excellent	Good	Fair	Poor	No basis for judgement
Increased Operational Efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time Savings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short Timeframe to Realize Value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good Level of Participation, e.g. Event Attendance/Number of members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased Employee Engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Number of Sponsored Ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Please suggest any Measures of Success that you think are important for Citizen Development initiatives within Microsoft Business Operations that have not previously been mentioned in this survey.

Appendix B. Survey Results

Table B1. Survey Responses—Respondent Demographics.

Respondent	Location	Department	Years at Microsoft	Previous Experience with Citizen Development or Low Code/No Code Development	If yes how many CD/LCNC projects have you worked on?	Previous experience with IT Projects?	If yes how many IT projects have you worked on?
R1	Dublin	Operations Manager	8	Yes	1	No	
R2	Dublin	Business Insights Manager	5	Yes	2	Yes	>20
R3	Dublin	Operations Product Manager	8	Yes	3	Yes	?50
R4	Dublin	Business Insights Manager	2	Yes	>5	Yes	?3
R5	Reno	Business Insights Manager	3	Yes	?10	Yes	a few
R6	Dublin	Product Manager	8	Yes	?100	Yes	>20
R7	Dublin	Operations Program Manager	15	No		Yes	>10
R8	Redmond	Risk Manager	4	Yes	?5	Yes	100s
R9	Redmond	Program Manager	3	Yes	25	Yes	6
R10	Reno	Program Manager	2	Yes	12	Yes	?10
R11	Redmond	Operations PM	3	Yes	?4	Yes	3
R12	Singapore	Transact Systems Manager	3.5	Yes	1	Yes	30
R13	Reno	Process Portfolio Lead	16	Yes	2	No	
R14	Redmond	Launch Manager	13	Yes	1	Yes	10
R15	Singapore	Process Program Manager	3.5	No		Yes	5
R16	Maryland USA	Business Program Manager	1	Yes	1	Yes	30
R17	Redmond	PM	20	Yes	6	Yes	5
R18	Ireland	Ops Program Manager	6	Yes	1	Yes	10
R19	Redmond	Sr. Site Reliability Engineer	25	Yes	1	No	
R20	USA	Program Manager	15	Yes	1	Yes	too many to count
R21	Dublin	SRE	1	Yes	1	Yes	20
R22	Dublin	ODM	1	Yes	1	Yes	5
R23	USA	Business Analyst	20	Yes	1	Yes	5
R24	Dublin	Data Engineer	0.2	Yes	1	Yes	20
R25	Dublin	Ops Program Manager	5	No		No	
R26	US	Manager	0.5	No		Yes	>50
R27	Dublin	Data Engineer 2	0.2	No		Yes	15 Approx
R28	Dublin	Process Program Manager	1	No		Yes	>20
R29	Ireland	Software Engineer	0.5	Yes	1	Yes	30
R30	Dublin	Program Manager	2	No		No	

Table B2. Survey Responses—Importance Ratings.

Respondent	Increased Operational Efficiency (Importance)	Time savings (Importance)	Short Timeframe to Realize Value (Importance)	Good Level of Participation (Importance)	Increased Employee Engagement (Importance)	High Number of Sponsored Ideas (Importance)
R1	Important	Extremely Important	Extremely Important	Important	Important	Extremely Important
R2	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important
R3	Important	Extremely Important	Extremely Important	Slightly Important	Important	Extremely Important
R4	Important	Important	Extremely Important	Important	Important	Important
R5	Important	Slightly Important	Extremely Important	Not Important	Important	Not Important
R6	Important	Important	Slightly Important	Not Important	Slightly Important	Slightly Important
R7	Slightly Important	Slightly Important	Important	Not Important	Not Important	Slightly Important
R8	Important	Extremely Important	Important	Slightly Important	Important	Important
R9	Important	Important	Extremely Important	Slightly Important	Important	Important
R10	Important	Important	Extremely Important	Important	Important	Slightly Important
R11	Extremely Important	Extremely Important	Extremely Important	Important	Important	Important
R12	Extremely Important	Extremely Important	Extremely Important	Slightly Important	Important	Slightly Important
R13	Extremely Important	Important	Important	Slightly Important	Slightly Important	Important
R14	Important	Important	Slightly Important	Important	Important	Slightly Important
R15	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important
R16	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important
R17	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important	Extremely Important
R18	Extremely Important	Important	Slightly Important	Slightly Important	Important	Important
R19	Extremely Important	Extremely Important	Important	Not Important	Not Important	Not Important
R20	Extremely Important	Extremely Important	Important	Slightly Important	Important	Slightly Important
R21	Important	Extremely Important	Slightly Important	Slightly Important	Slightly Important	Slightly Important
R22	Extremely Important	Extremely Important	Important	Extremely Important	Important	Important
R23	Important	Slightly Important	Extremely Important	Important	Important	Important
R24	Extremely Important	Extremely Important	Important	Important	Important	Not Important
R25	Extremely Important	Extremely Important	Important	Important	Important	Important
R26	Slightly Important	Slightly Important	Slightly Important	Extremely Important	Extremely Important	Extremely Important
R27	Important	Extremely Important	Slightly Important	Extremely Important	Important	Important
R28	Extremely Important	Extremely Important	Extremely Important	Important	Important	Extremely Important
R29	No Basis for Judgement	Important	Extremely Important	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement
R30	Important	Important	Not Important	Slightly Important	Important	Slightly Important

Table B3. Survey Responses—Performance Ratings.

Respondent	Increased Operational Efficiency (Importance)	Time savings (Importance)	Short Timeframe to Realize Value (Importance)	Good Level of Participation (Importance)	Increased Employee Engagement (Importance)	High Number of Sponsored Ideas (Importance)
R1	Good	Good	Fair	Good	Good	Good
R2	Good	Good	Good	Excellent	Good	Good
R3	Poor	Fair	Poor	Fair	Fair	Poor
R4	Fair	Fair	Poor	Good	Good	Good
R5	Fair	Poor	Poor	Poor	Fair	Poor
R6	Excellent	Excellent	Good	Poor	Fair	Fair
R7	No Basis for Judgement	No Basis for Judgement	Fair	Poor	Fair	Fair
R8	good	Good	Good	Fair	Fair	Fair
R9	good	Good	Good	fair	no Basis for Judgement	no Basis for Judgement
R10	good	Good	Good	good	good	Good
R11	good	Excellent	Good	good	Fair	Fair
R12	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Fair	no Basis for Judgement	no Basis for Judgement
R13	Good	Good	Excellent	Fair	Good	Fair
R14	Fair	Poor	Fair	good	poor	Fair
R15	fair	Fair	Fair	Excellent	Fair	Fair
R16	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
R17	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Excellent	no Basis for Judgement	no Basis for Judgement
R18	Excellent	good	Excellent	fair	Excellent	Good
R19	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Poor	no Basis for Judgement	no Basis for Judgement
R20	Good	fair	Poor	Fair	poor	Poor
R21	Excellent	Good	Fair	Fair	Fair	Fair
R22	Excellent	Excellent	Good	Excellent	Excellent	Good
R23	No Basis for Judgement	No Basis for Judgement	Poor	Good	poor	poor
R24	Good	Good	Good	Good	Good	Good
R25	Good	Good	Good	Good	Good	Good
R26	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Excellent	no Basis for Judgement	no Basis for Judgement
R27	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Excellent	no Basis for Judgement	no Basis for Judgement
R28	No Basis for Judgement	No Basis for Judgement	No Basis for Judgement	Good	no Basis for Judgement	no Basis for Judgement
R29	No Basis for Judgement	No Basis for Judgement	Good	no Basis for Judgement	no Basis for Judgement	no Basis for Judgement
R30	Good	Good	No Basis for Judgement	Fair	Fair	no Basis for Judgement