FACTORS AFFECTING SME DECISION MAKERS ADOPTION OF ERP SYSTEMS[*]

KOBİ`LERDE KARAR VERİCİLERİN ERP SİSTEMLERİ KABULÜNÜ ETKİLEYEN FAKTÖRLER

Mustafa Cem Arpacı[1], Serhat Çakır[2]

ABSTRACT: In the current business landscape, envisioning a world without information technology presents a significant challenge. Enterprise Resource Planning (ERP) systems constitute the backbone of information for modern organizations. The technology adopted by SME owners and managers affects the entire organization. However, research on technology acceptance is primarily at the organizational level, and the area of decision-makers technology acceptance behavior in SMEs remains underexplored. This study aims to qualitatively examine the factors influencing the acceptance of ERP systems by decision-makers in small to medium-sized enterprises (SMEs) operating in the manufacturing industry. The qualitative approach is preferred because it allows for an in-depth examination of the factors influencing ERP adoption decisions by owners and managers of manufacturing industry SMEs, providing a rich content method.

Keywords: Qualitative Research, Enterprise Resource Planning, ERP, Technology Acceptance Model, TAM, Small to Medium Sized Enterprises, SME

ÖZ: Günümüz modern iş ortamı bilişim teknolojilerinin varlığı olmadan düşünülemez. Kurumsal kaynak planlaması (ERP) sistemleri, modern organizasyonların bilgi omurgasını oluşturmaktadır. KOBİ sahipleri ve yöneticileri tarafından benimsenen teknoloji tüm organizasyonu etkilemektedir. Buna rağmen teknoloji kabulüne ilişkin araştırmalar daha ziyade örgüt düzeyindedir ve KOBİ'lerde karar vericilerin teknoloji Kabul davranışı üzerinde az çalışılmış bir alan olarak kalmış bulunmaktadır. Bu çalışmanın amacı, İmalat sektöründe faaliyet gösteren küçük ve orta ölçekli işletme (KOBİ) karar vericilerinin ERP sistemlerini kabulünü etkileyen faktörleri nitel olarak incelemektir. Nitel yaklaşım, imalat sanayi KOBİ'lerinin sahipleri ve yöneticileri tarafından ERP kabul kararını etkileyen faktörleri derinlemesine incelemeye izin veren zengin içerikli bir yöntem sağlaması nedeniyle tercih edilmiştir.

Anahtar Kelimeler : Nitel Araştırma, Kurumsal Kaynak Planlaması, ERP, Teknoloji Kabul Modeli, KOBİ.

1. Dr., cemarpaci@gmail.com, https://orcid.org/0000-0002-5146-3131
2. Prof. Dr., Başkent Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Teknoloji ve Bilgi Yönetimi, serhatc@baskent.edu.tr https://orcid.org/0000-0002-1588-1360

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EXTENDED SUMMARY

Çalışmanın Amacı

Bu çalışmanın bağlamını bölgesel ve yerel ekonomik büyümenin belkemiği olan küçük ve orta ölçekli işletmeler (KOBİ'ler) oluşturmaktadır. KOBİ sahip ve yöneticilerinin iç ve dış faktörlerin etkisi ile şekillenen teknoloji kabul kararı, tüm organizasyonu etkilemektedir. Literatürde teknoloji kabul davranışı daha ziyade organizasyon düzeyinde incelenmiş olup KOBİ'lerde karar vericilerin teknoloji kabul davranışı yeterince incelenmemiş bir olgu olarak kalmış bulunmaktadır. Bu çalışma, teknoloji kabul modeli (TAM) ekseninde, KOBİ sahipleri ve yöneticilerinin kurumsal kaynak planlaması (ERP) sistemlerini benimsemesini etkileyen faktörleri nitel olarak keşfetmeyi amaçlamaktadır.

Araştırma Soruları

Bu çalışmanın temel amacı, KOBİ sahipleri ve yöneticilerinin ERP sistemlerini kabul davranışını açıklamak çin genişletilmiş bir Teknoloji Kabul Modeli (TKM) önermektedir.

Literatür Araştırması

Günümüzde büyük ölçekli işletmeler için bir gereklilik haline gelen ERP sistemleri, giderek yaygınlaşan bir şekilde KOBİ'ler tarafından da rekabetçi bir gereklilik olarak kabul edilmeye başlamış bulunmaktadır (Klaus ve diğerleri, 2000). KOBİ'ler, stok ve envanter yönetimi, işletmeye ait verilerin merkezi tek bir noktada toplanması, ve işletme maliyetlerinin etkin yönetimi amaçlarına ulaşmak için ERP sistemlerini benimsemektedir (Shiau ve diğerleri, 2009). Bu çalışma, KOBİ sahiplerinin ve yöneticilerinin ERP sistemi benimseme kararını etkileyen faktörleri anlamak için Teknoloji Kabul Modeli'ni (TKM) kullanmaktadır. TKM, yeni bilgi teknolojilerinin kabulü üzerindeki dış faktörlerin etkisini anlamak için geliştirilmiştir (Davis ve diğerleri, 1989). Model, bir bireyin yeni bir bilgi teknolojisini satın alma veya kullanma niyetiyle ilgili davranışsal niyetini yansıtan iki içsel inancı kullanır: algılanan fayda ve algılanan kullanım kolaylığı (Wang ve diğerleri, 2008). Algılanan fayda , " bireyin belirli bir sistemi kullanmanın iş performansını artıracağına olan inancı" olarak tanımlanır (Davis 1986, 25). Benzer şekilde, algılanan kullanım kolaylığı, " bireyin belirli bir sistemin ek fiziksel ve zihinsel çaba gerektirmeden kullanılabileceğine dair inancı" olarak tanımlanır (Davis 1986, 25). Nicel araştırmalar algılanan fayda değişkeninin teknoloji kabul davranışının en iyi belirleyicisi olduğunu belirtmektedir (Davis ve diğerleri, 1989; Mathieson, 1991; Venkatesh ve diğerleri, 2003; Venkatesh & Davis, 2000). KOBİ sahipleri ve yöneticileri ile gerçekleştirilen nitel görüşmeler, organizasyonel hazırlık düzeyi, çalışan direnci, organizasyonel uyumluluk ve subjektif norm değişkenlerinin ERP sistemlerinin kabulü üzerinde etkisi olduğunu ortaya koymuştur. Yazında organizasyonel hazırlık düzeyi değişkeni Iacovou ve diğerleri (1995) tarafından teknoloji-organizasyon-çevre modeli içerisindeki teknoloji ve organizasyon bağlamı birleştirerek önerilmiştir, benimseme davranışı üzerinde olumlu bir etkiye sahiptir. Öte yandan, çalışan direnci, ERP sistemlerinin benimsenmesi üzerinde olumsuz bir etkiye sahiptir (Hong & Kim, 2002). Son olarak, Rogers'ın (1983) yeniliklerin yayılması teorisinde de yer alan uyumluluk, KOBİ'ler tarafından teknolojinin benimsenmesini etkileyen önemli bir faktördür (Kendall ve diğerleri, 2001; Thong, 1999; Zhu ve diğerleri, 2006). KOBİ'ler, mevcut iş uygulamalarıyla uyumlu bilgi teknolojilerini benimseme olasılığı daha yüksektir. Subjektif normlar ise, bir davranışı gerçekleştirme veya gerçekleştirmeme yönünde algılanan sosyal baskıyı ifade eder (Ajzen, 1991) ve kullanım davranışını açıklamada önemli bir rol oynayabilir (Davis 1986).

Yöntem

Bu araştırma, KOBİ'lerde karar vericilerin ERP sistemlerini kabulünü etkileyen faktörleri nitel olarak anlamayı amaçlamaktadır. Araştırmanın birimi, karar vericinin kendisi; şirket sahibi, ortağı veya üst düzey yöneticisidir. Veri, soruların sıralaması ve cümle yapılarının önceden belirlendiği standart açık uçlu mülakatlar yoluyla toplanmıştır. On yedi araştırma sorusu tamamen açık uçlu bir biçimde oluşturulmuş olup, katılımcılar aynı soru setine yanıt vermiştir. Literatür taramasından elde edilen bulgular açık uçlu soruların geliştirilmesi sürecinin temelini oluşturmuştur. Bu araştırma için etik onay, 05/04/2018 tarihinde 28620816/189 başvuru numarası ile ODTÜ İnsan Araştırmaları Etik Kurulu'ndan alınmıştır.

Sonuç ve Değerlendirme

Bu araştırma, imalat sektöründe faaliyet gösteren KOBİ karar vericilerinin ERP sistemi kabul davranışını nitel olarak değerlendirmeyi amaçlamaktadır. Veri analizi, TKM'ne dayanmaktadır. Önceki nicel araştırma bulgularından yola çıkılarak yapılan mülakatlar, dört ana kategoriye odaklanmıştır: Algılanan fayda, kullanım kolaylığı, organizasyonel hazırlık ve uyumluluk. ERP sistemlerinin algılanan faydası, KOBİ karar vericilerinin izlenebilir iş süreçleri oluşturma beklentisinden kaynaklanmaktadır. KOBİ sahipleri ve yöneticileri izlenebilir iş süreçlerinin işletmenin iş yapma yeteneğini artıracağını; ayrıca etkin ve doğru maliyet analizi sağlayarak büyüme potansiyelini ortaya çıkaracağına inanmaktadır. Bulgular, kullanım kolaylığı algısının, çalışanların kabul

direnci üzerinde dolaylı bir etkisi olduğunu göstermektedir. Yüksek kullanım kolaylığı algısı, karar vericilerin çalışanların mevcut niteliklerine olan güveninin bir göstergesi olarak ortaya çıkmaktadır. Çalışanların ERP sistemini kolay kullanabileceğini düşünen karar vericiler, benimsemeye karşı daha az çalışan direnci bekler ve bu direnci aşmak için daha az finansal kaynak ve yönetsel zaman harcamayı ön görürler. ERP sistemleri, işletmelere iş süreçlerini temsil eden boş bir kabuk sağlamaktadır. Bu boş kabuğun, işletme ihtiyaçlarına göre özelleştirilmesi, bu özelleştirme sonrasında ise işletme çalışanları günlük görevlerini yerine getirirken doğru verilerle doldurulması gerekmektedir. KOBİ'lerde ERP sistemlerinin özelleştirilmesi aşamasında iş süreçlerinde bazı onay adımlarının atlandığı ve işletmeye özel raporlar ile bu durumun telafi edilmeye çalışıldığı tespit edilmiştir. Varsayılan iş süreçleri içinde bazı onay adımlarının KOBİ'lerde orta düzey yönetim eksikliğinden dolayı atlandığı görülmüştür. Orta düzey yönetim kademesinin oluşturulması ek nitelikli çalışan ihtiyacı olarak görülmekte olup finansal kaynakların mevcudiyetini gerektirmektedir. ERP sistemlerinin kabulü için gerekli bilgi teknolojisi altyapısını sağlamak ve ihtiyaç duyulan nitelikli iş gücüne ulaşmak için yeterli finansal kaynakların bulunması kabul kararını olumlu yönde etkilemektedir. Karar vericilerin yüksek organizasyonel uyumluluk algısının; daha az finansal kaynak ve yönetsel zaman ihtiyacı, daha az dış kaynağa bağımlılık anlamına gelmekte olduğu; bu nedenle ERP sistemlerinin kabulü açısından daha yüksek bir organizasyonel hazırlık düzeyini ifade ettiği gözlemlenmiştir. Organizasyonel büyüklüğün, aynı zamanda benimseme kararlarına yol açan yönetsel ve operasyonel karmaşıklığın bir göstergesi olduğu anlaşılmıştır. ERP sistemlerinin kabulünü gerektiren yönetsel ve operasyonel karmaşıklığa işletmelerin zaman içerisinde ulaştığı, bu sistemlerin kabulünü bir ihtiyaç olarak algıladığı görülmüştür. Benzer şekilde,işletmelerin ERP sistemleriyle uyumlu iş süreçleri geliştirmesi de ancak zaman içerisinde mümkün olabilmektedir. Bu nedenle karar vericiler eğitim ve sertifikasyon ile ilgili devlet teşviklerini, işletmenin işlem tabanlı yönetim sisteminden süreç tabanlı yönetim sistemine geçişi için bir fırsat olarak değerlendirmelidir. Kalite sertifikalarının sadece ihalelere katılmak veya müşteri standartlarını karşılamak için gerekli belgeler olarak görmekten uzaklaşılması gerekmektedir. Süreç tabanlı yönetim yaklaşımını benimseyen, ilgili maliyetleri zamana yayarak kalite sistemlerini içselleştiren imalat KOBİ'leri için ERP sistemlerinin kabulü çok daha zahmetsiz olacaktır.

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1. INTRODUCTION

Owners and executives play a dominant role in the technology acceptance decision of SMEs (Fink, 1998, 244). In small organizations, technology adoption decision is primarily given by the business owner, and in larger ones, top management support plays an important role in the adoption decision. (Caldeira & Ward, 2001; Premkumar & Roberts, 1999)

Organizational technology acceptance research in SMEs identified many factors as a probable explanation for the acceptance of new technologies. It would be unreasonable to expect a unique unified answer related to the adoption of new technologies. Diffusion of innovation theory provides an essential contribution to the adoption research by identifying the perceived innovation characteristics. The technology-organization-technology framework asserts that divergence in adoption behavior is due to the contextual differences between the organizations. Resembling the aforementioned two theories, the technology acceptance model extends the adoption research from the organizational to the individual level.

The technology acceptance model (TAM) is a foundation for evaluating SME owners and executives' adoption of ERP systems. Reflecting an individual`s behavioral intention related to buying or using a new information technology, the model uses two internal beliefs, perceived usefulness (PU) and perceived ease of use (PEU) (Wang et al., 2008). The validity and reliability of TAM, together with its generalizability across time, different populations, cultures, and technologies, is well tested and approved by many researchers (Venkatesh et al., 2007).

Quantitative research dominates technology adoption-related research (Y. Lee et al., 2003; Vogelsang et al., 2013). Alternatively, by gathering richer information from a small number of subjects, qualitative research methodology may address the shortcomings of pure quantitative studies and offer a complementary way for theory building. This study first identifies a set of factors that could influence decision-makers' acceptance of technology. Then, in the theory-building process, by verifying these factors qualitatively, influencing parameters are derived from the statements of the interviewees. As a result, this study aims to increase understanding of owners and executives` technology adoption and barriers to such adoption

2. RESEARCH CONSTRUCTS

2.1. Perceived Usefulness

Relative advantage is "the degree to which using an innovation is perceived as being better than the idea it supersedes" (Rogers, 1983). Relative advantage is the equivalent of the perceived usefulness construct in TAM. Perceived usefulness is "the degree to which an individual believes that using a particular system would enhance his or her job performance" (Davis, 1986). The term relative advantage is too broad and vague; therefore, usefulness may be a better name for the construct (Moore & Benbasat,

1991). Both constructs are defined similarly as a relative improvement in performance and measured based on their impact on performance(Moore & Benbasat, 1991; Taylor & Todd, 1995). Later, the unified technology acceptance model renamed the perceived usefulness construct as performance expectancy. The renamed construct is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" and has a direct effect on the intention to use(Venkatesh et al., 2003) .

Literature review about technology adoption by organizational users (Davis et al., 1989; Mathieson, 1991; Venkatesh et al., 2003; Venkatesh & Davis, 2000) consistently suggest that relative advantage/perceived usefulness/ performance expectancy/perceived benefits are the best predictors of the behavioral intention to adopt a technology. Empirical research findings also support that perceived usefulness is an important factor affecting ERP adoption by SMEs (Ramdani et al., 2009, 2013; Shiau et al., 2009). If SMEs see no relative advantage related to adopting an enterprise resource planning system, they will not intend to adopt it.

2.2. Perceived Ease of Use

Perceived ease of use is "the degree to which an individual believes that using a particular system would be free of physical and mental effort"(Davis, 1986). As an innovation characteristic, complexity is the equivalent of the perceived ease of use construct in the technology acceptance model (Moore & Benbasat, 1991). Complexity negatively affects technology adoption(Rogers, 1983; Tornatzky & Klein, 1982) . Complicated technologies less understood by social system members will be adopted more slowly (Rogers, 1983). ERP systems are complex systems that impose their logic on an organization`s strategy, culture, and structure (Davenport, 1998). Perceived complexity may negatively affect the adoption of these systems. It is also possible that as decision-makers owners and executives may bear with a complex technology in exchange for usefulness(Davis et al., 1989; Ramdani et al., 2009).

Literature review about technology adoption by organizational users (Venkatesh, 2000; Venkatesh et al., 2003; Venkatesh & Bala, 2008) suggest that perceived ease of use has a direct effect on intention, and an indirect effect also exists via perceived usefulness. ERP systems are complex systems that impose their logic on an organization`s strategy, culture, and structure (Davenport, 1998). Perceived complexity may negatively affect the adoption of these systems. It is also possible that as decision-makers owners and executives may bear with complex technology in exchange for usefulness (Ramdani et al., 2009; Sheppard et al., 1988).

Adoption decisions given by owners and executives affect the entire organization. They assess the technology on behalf of the organization`s users. They are rather interested in the results obtained by the employees through the use of the adopted technology. Therefore, within this research, the

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perceived ease of use construct represents: "owners and executives' personal belief on the difficulty of understanding and using ERP system by employees".

2.3. Organizational Readiness

SMEs are reliant on external resources mainly due to poverty in terms of human and financial resources (Fink, 1998). Reliance on external resources also means that they cannot implement and manage their information systems(Blili & Raymond, 1993) . Technology is adopted due to its perceived benefits by the organization; if the perceived benefits cannot be achieved due to a lack of resources, adoption is meaningless (Kuan & Chau, 2001). In their study on EDI adoption among SMEs, Iacovou et al. (1995) introduced the concept of organizational readiness by combining technological and organizational contexts within the technology-organization-environment framework

The perceived organizational readiness construct relates to decision-makers' perceptions of the organization's financial and technological readiness. Financial readiness refers to the procurement, installation, implementation, and ongoing usage costs (Iacovou et al., 1995). The availability of financial resources enables organizations to access the necessary technology-related resources. Technological readiness is concerned with the level of information technology sophistication and usage in an organization (Iacovou et al., 1995). Implementation of ERP systems require substantial investments in terms of time, money, and internal resources (Pan & Jang, 2008). The availability of technical resources such as infrastructure and skills facilitating technology adoption positively affects the intention to adopt (Kuan & Chau, 2001). The availability of facilitating conditions will help the individual to overcome the obstacles with the new technology thus has a positive effect on perceived ease of use(Venkatesh, 2000).

2.4. Employee Resistance

Hong & Kim (2002) found that employee resistance has a significantly negative association with the successful adoption of ERP systems. An organization`s daily operation is made of complex business activities that need to be carried out by existing employees. ERP system adoption will eventually require employees to change their existing workstyle. Investing in employees' existing information technology skills and convincing the employees that the effort to complete a task through the usage of an ERP system does not bring additional workload will help to eliminate employee resistance by reducing computer anxiety.

Computer anxiety is about fear of using information technology (Venkatesh & Davis, 2000). Computer anxiety and perception of increased workload are factors shaping employee's perception related to the ease of use of a new system(Venkatesh, 2000). Adoption of ERP systems is a transition from unmethodical and verbal to documented and systematic task generation. In addition to computer

anxiety, this transition may induce fear of control and job security concerns, especially for employees who lack the necessary knowledge and technical skills to perform their daily tasks.

Building upon Venkatesh's research (2000), owners and executives who trust that their incumbent staff possesses the requisite qualifications for effective utilization of ERP systems may anticipate less resistance to the adoption decision.

2.5. Compatibility

Compatibility refers to how well an innovation aligns with the prevailing values, past experiences, and requirements of potential adopters (Rogers, 1983). Cognitively, compatibility is related to "what people feel or think about the technology," and practically, it's about consistency with operational needs (Tornatzky & Klein, 1982). Compatibility defines decision makers' perception of ERP systems' congruity with their preferred work style, existing work style, past experiences, and values (Karahanna et al., 2006).

The literature review suggests that compatibility is an important factor affecting technology adoption by SMEs. SMEs are more likely to adopt information technologies compatible with current work practices(Kendall et al., 2001; Thong, 1999) . SMEs are characterized by a scarcity of resources (Blili & Raymond, 1993; Fink, 1998). Implementing and configuring ERP systems can be costly and may even require the reengineering of an existing business, hence compatibility with existing values, work style and business procedures may be a major concern(Everdingen et al., 2000). There is also empirical evidence that, as a construct, compatibility does affect the adoption of enterprise-level applications(Hung et al., 2010). Configuring ERP systems is a matter of compromises that requires balancing between the way the organization wants to work and the way the system wants to organization to work(Davenport, 1998).

Hong & Kim (2002) later redefined the compatibility construct as organizational fit. Organizational fit is "the degree of alignment between ERP systems and organizational needs in terms of data, process and user interface" and positively affects the successful adoption of ERP systems(Hong & Kim, 2002) .

2.6. Subjective Norms

In its broadest definition, subjective norms refer to perceived social pressure to perform or not to perform a behavior (Ajzen, 1991). Subjective norms are about the decision maker`s perception that most people who are important to him think that he should or should not perform the behavior in question(Venkatesh & Davis, 2000). Davis et al. (1989)believe that subjective norms may be a determinant of behavioral intention when information technology usage is mandatory. For mandatory usage, subjective norms are found to be the most important determinant of behavioral intentions (Hartwick & Barki, 1994). In mandatory use scenarios, the causal mechanism underlying the effect of

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subjective norms on behavioral intention is compliance (Venkatesh & Davis, 2000). Compliance is a strong behavioral stimulus for developing countries(Datta, 2011a). Compliance implies that social influence is triggered by expectations of reward or avoidance rather than personal belief in the outcome (Datta 2011, 11).

Subjective norms affect perceived usefulness in both mandatory and voluntary use scenarios (Venkatesh & Davis, 2000). Taylor and Todd add to the topic by stating that in a mandatory usage scenario, the significance of subjective norms on intention depends on the referent group: "expectations of peers, subordinates and superiors may be different…in which case the effects of referent groups may cancel each other"(Taylor & Todd, 1995).

Another concept related to subject norms is image which is defined as "the degree to which use of an innovation is perceived to enhance one`s status in one`s social system" (Moore & Benbasat, 1991). Subjective norms have a positive effect on image and in return, image affects perceived usefulness (Venkatesh & Davis, 2000). Subjective norms and image are socially influential factors affecting perceived usefulness. Subjective norms/social influence is a factor directly affecting managers' intention to adopt technology (Grandón et al., 2011; Riemenschneider et al., 2003).

Image is a factor affecting the adoption of electronic commerce and business homepages by SMEs(Kaynak et al., 2005; J. Lee, 2004) . Similarly, subjective norms/social influence is a factor directly affecting managers' intention to adopt technology(Grandón et al., 2011; Riemenschneider et al., 2003). (Datta 2011) has shown that social influence from peers, colleagues, and associates affects the SME`s e-commerce adoption decision. Overall, previous research underscores subjective norms as a critical factor influencing technology adoption decisions among SMEs.

3. METHODOLOGY

3.1. Data Collection

This research aims to qualitatively understand the factors affecting SME decision maker`s ERP adoption decisions. The unit of inquiry is the company owner, partner, or top-level executive. Data is gathered through open-ended interviews where the wording and sequence of questions are determined in advance. Questions are worded in an utterly open-ended form, and respondents answer the same questions. The semi-structured nature of the questions helped to focus the interview on key topics and allowed the researcher to effectively use the respondent`s limited time. It also increased the comparability of responses and reduced researcher bias as standardization may compensate for the researcher`s experience in interviewing.

17 research questions are developed. Information and categories deduced from the literature review established the basis for question development. The six main themes of the interview questions

targeted are perceived usefulness, perceived ease of use, organizational readiness, compatibility, and subjective norms.

The appropriateness and completeness of the draft interview questions are controlled by an academician who has done extensive consultancy work for ERP implementations. An expert in corporate communication has also checked the draft questions for unambiguity. The reviewers assessed if the draft questions were logically sequenced, used a language that participants could easily understand, and were likely to extract in-depth pertinent information. Next, revised draft interview questions are used to conduct a pilot study with two decision-makers in the manufacturing industry. During the interviews, the researcher observed the interviewee's reactions to the questions. After the interview, participant feedback is obtained. As a result, some questions are rephrased to avoid misunderstandings. To ensure that participants feel comfortable while answering the questions, sequencing is also rearranged from a simple to a gradually more complex structure.

Participation in the research study was voluntary. The interviews are scheduled based on a timeframe proposed by the participants. Conducting the interviews with participants in the participants', natural settings provided a relaxed and convenient environment and helped to obtain prolonged engagement, which led to the collection of rich and thick data capable of providing descriptive data quality. Rather than interrupting surprising bidirectional responses, these responses are explored by asking additional questions. As a final step before starting the interviews restructured interview questions are sent to the university ethical committee for permission to start a qualitative study. The researcher also prepared a consent form used for debriefing the participants before interviews.

During the interviews, participant stress and irritation are minimized by allowing them to answer a phone, respond to an inquiry from employees, or take a break anytime that they want. Such an approach enabled the researcher to observe the interviewees in their natural setting. The researcher tried to carry a neutral stance during the interviewing process, yet the fact that a human being conducts the actual interviews means that bias cannot be entirely ruled out.

The interviews were conducted and analyzed in Turkish. Qualitative interviews are not translated into English as such attempts may cause a loss of information. Findings are shared descriptively in English.

Each interview is first recorded, and transcriptions of the recorded interviews are conducted later. Transcripts are coded with MaxQda software. The coding structure can be best described as a tree structure where the root represents the research objective and subsequent branches represent the categories. Initial coding started based on themes relevant to the research objectives identified from the literature review. Iterations during the coding process created additional ones. Subcategories under each level of category provided explanatory details of the corresponding branch. The researcher obtained a matured coding structure by adjusting the initial coding design through iterations. Mature coding

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structure is tested for density and consistency by determining frequencies such as the number of codes per interview, number of categories per interview, and number of codes per category. Low-frequency codes implied that there was not enough support from the data. These codes are revisited by re-analyzing each interview for that code only. The same process is also applied to a large frequency of codes. A large frequency implies a vast category that is not capable of carrying a distinct meaning; hence, when possible, they are split into subcategories. The final coding schema aims to establish a conceptual framework to answer research questions. The coding and analysis of qualitative data is dependent on the researcher. To minimize subjectivity in the interpretation of data, the researcher has also decided not to define a pre-determined coding strategy.

3.2. Sampling

Sample size in qualitative study depends on obtaining most or all of the perceptions that will lead to saturation, where adding more participants does not provide additional perspectives or information (Marshall, 1996). To avoid bias caused by convenience-based sampling, the researcher has focused on finding the participants that may provide the most significant impact on the development of knowledge. To accomplish critical case sampling assuring maximal variations related to the phenomenon, throughout the snowball sampling process the researcher paid extra attention to finding SMEs manufacturing different products, representing different organizational sizes and having owners with different educational backgrounds. A sample size of 10 participants may be considered adequate for critical case sampling (Sandelowski, 1995). Snowball sampling also limits the researcher`s bias toward the participants.

The exploratory nature of this qualitative research required to define participants suitable to contribute with their knowledge and experience. Participant criteria one to three emphasize the attributes related to the participant`s enterprise. Criteria four to eight focus on key participant attributes.

1. **Industry:** SMEs must operate in the manufacturing industry. In the manufacturing industry CEO and other top managers are frequently owners of the organization (Caldeira & Ward, 2001, p.1165).

2. **Company Size**: Research conducted by the Turkish Ministry of Science, Industry, and Technology in 2012 (Postaci et al., 2012) also found that only 12,7% of the Turkish SMEs with less than 10 employees adopted ERP systems. The participant`s enterprise must employ more than 20 less than 250 employees.

3. **Location:** Manufacturing industry SME must be located within the city limits of Ankara, Turkey. Although adoption decisions may vary between countries, there is no evidence that variations in metropolitan areas influence the adoption decision (Wamba & Carter, 2013). To challenge the location assumption researcher has conducted two interviews in two major metropolitan cities, Istanbul and Izmir.

4. **Participant`s Role in the Organization:** The participant is either the owner, actively working shareholder, or high-level executive of an SME operating in the manufacturing industry.

5. **Participant`s Language:** The participant must be fluent in Turkish. This research is conducted and written in English in Ankara, Turkey. It would not be feasible to expect that participants will have an advanced level of English. The researchers' mother tongue is also Turkish.

6. **Participant`s Educational Background:** Participants from diverse educational background is considered important to obtain wide range of opinions.

7. **Participant`s Gender:** The researcher couldn't consider gender as an attribute due to the male-dominant nature of decision-makers in the Turkish manufacturing industry.

8. **Participant`s Age:** The participant`s minimum age must be 30 years old. Younger participants may not have the necessary business knowledge and experience

3.3 Ethical Disclaimer

Ethical approval for this research is obtained from the METU Human Research Ethics Committee on 05/04/2018 with application number 28620816/189.

4. RESEARCH FINDINGS

4.1. Description of the Cases

Qualitative interviews are conducted with 16 participants from 13 companies. Characteristics are presented in Table 1. Two interviews were conducted with companies located in Izmir and Istanbul. The remaining interviews are conducted with companies in Ankara. Interviews revealed that geographical location does not affect decision maker`s views related to the adoption of ERP systems. However, it is important to note that all interviewed companies had operations exceeding city limits. They were also either exporting or importing products.

Table 1: Interviewed Company Characteristics

Company	Products	Turnover (million $)	Number of Employees
A	Custom-crafted wooden furniture tailored for construction ventures.	1.1	25
B	Pure fruit juices made entirely from natural ingredients and certified organic products.	19.6	106
C	Manufacturer specializing in abrasives for natural stone and ceramic	5.3	26
D	Supplier specializing in spare parts for earthmoving machinery.	4.2	75
E	Supplier of stainless litter bins, garden furniture, polythene playground equipment	8.4	138
F	Manufacturer specializing in sheet metal processing and welding for lifts, energy, and the automotive subordinate industry	3	33
G	Manufacturer and wholesaler of folding glass balcony systems.	5.6	30
H	Manufactures and sells light construction equipment	5.6	80
I	Manufactures and sells Industrial adhesive tapes, industrial thermal control panels	3.8	49
J	Manufactures stainless steel and sheet metal for construction projects.	2.8	88
K	Manufacturer and retailer of leather goods for men and women.	4.2	100
L	Manufacturer and retailer of women's clothing.	15.6	220
M	The company produces and retails women's veiling clothing.	20	247

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Interviewees were all aware of the ERP system's likelihood of providing a competitive advantage. Subject to cost-benefit analysis, they all had a positive intention towards adoption. Statements from interviewees F1 and H1 best describe this dilemma:

"When I conduct a cost-benefit analysis tailored to our specific requirements, the thought of investing in SAP hardly crosses my mind, although CANIAS is also costly. This prompts one to contemplate prioritizing short-term profitability by investing in production-related items, rather than allocating funds to these systems. The affordability of such systems is a crucial factor to consider."

"To market machinery effectively, it's essential to manufacture it at low production costs. Achieving lower production costs necessitates the utilization of technology. We are inclined to invest in technology that will effectively reduce our production costs. However, it's imperative to conduct a thorough cost-benefit analysis; I wouldn't consider investing in technology that might lower costs but only pays for itself over 15 years."

4.2. Perceived Usefulness

In conjunction with the literature review, SME owners and executives are willing to adopt ERP systems based on their perception of perceived usefulness.

Figure 1: Category Frequencies
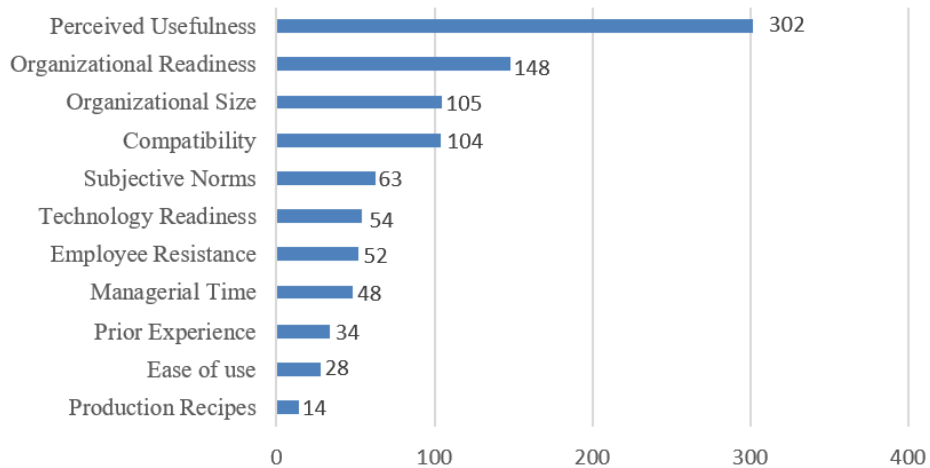
Supporting Blili & Raymond (1993) and Mabert et al. (2003), rather than strategic consideration, interviewed SME owners and executives were willing to adopt ERP systems for tactically achieving short-term operational needs.

Initially, in a typical manufacturing SME, the realization and documentation of business processes depend on employees' initiative. Dispersed, uncontrolled, and unorganized data collection (on paper, accounting systems, Microsoft Excel Sheets, and other external systems) eventually leads to an uncoordinated, chaotic business environment. Decision makers intuitionally manage this business environment by relying on their experience and skills. Such a management style implies judgmental decision-making where the consequences of different alternatives are not calculated.

By dictating standardized traceable business processes to employees, ERP systems are perceived as a tool that provides control over business. Control is defined as the ability to perform accurate and effective cost analysis. The following statement of interviewee D1 summarizes this finding:

"...I think the main goal of this system is to show managers how much it costs to make company products. There are many other systems, but the good ones can tell managers the cost of products. Whether it's 1000 Lira or 100 thousand Lira, spending money is pointless if a system can't do this. It should help managers figure out how to measure and lower costs...."

Traceability is *"an organizational capability to record, represent, and reproduce transactions and operations related to business processes"*(Durstewitz & Boy, 2001). Owners and executives expect that traceability will enable them to leverage core business competencies. Leveraging core business competencies will secure financial profitability which is eventually expected to lead to the realization of growth potential. It provides the basis for continuous improvement. Owners and executives expect that traceability will enable them to leverage core business competencies. Thus, by providing precise control over business will eventually lead to the realization of their growth potential.

The following statements supports the researcher`s finding:

Interviewee D1:" Our company was trying hard to grow, and it was clear that we could achieve that by using ERP systems…"

Interviewee B2:" We do have growth potential and to realize this growth potential we felt the need for a system…" (while explaining why they felt the need for an ERP system)"

Figure 2: SME ERP Adoption Perceived Usefulness Concept Map
(Numbers between parenthesis represent frequency for each subcategory)
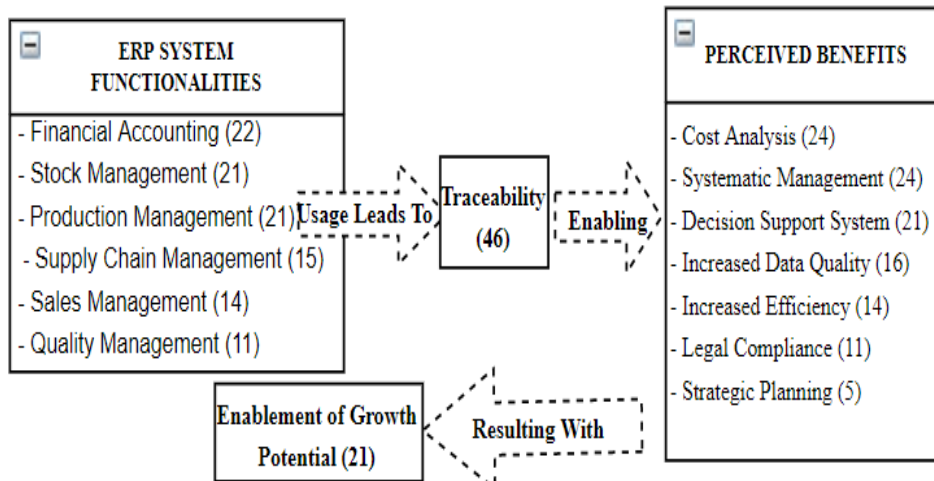
The adoption of ERP systems denotes the beginning stage of analytical decision-making where the consequences of explicit goals and alternatives are calculated. In contrast with large enterprises, manufacturing SMEs could only achieve organizational benefits of ERP systems in the long term through consistent usage. The long-term observability of perceived benefits creates a dilemma about

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using scarce financial resources. An investment in production technologies enabling cash flow in the short term may be preferred over the adoption of ERP systems:

> *"Interviewee I1: Cost considerations lead to prioritizing short-term profitability by investing in production-related items rather than allocating funds to these systems. The affordability of ERP systems is a crucial factor. As a country, our focus is on enhancing production and increasing exports, yet information technology comes at a significant cost…"*

4.3. Perceived Ease of Use

Table 3: Summary of Opinions About Ease of Use

Company/Interviewee	Opinions About Ease of Use
A1, B1, C1, F1, J1, H1, H2, L2	Ease of use is important for widespread usage as employees are the end user
B2, D1, J1, H1, H2, L2	Ease of use is important for overcoming work habits related issues and finding qualified workforce that will use the software *(H1 and H2 have considered ease of use as an important criterion as part of custom ERP software development efforts)*
E1	Ease of use is important, yet my observation is user interfaces of available solutions are almost identical and therefore ease of use shouldn`t cause any usage related problem
G1	As an elementary school graduate, I have never thought about it. My vision was to adopt a software that will enable systematic management.
I1	Did not provide an opinion about ease of use
K1, M1	Employee perception related to ease-of-use changes overtime. Managerial efforts will bring widespread usage. If a software is useful for our company, we will learn how to use it.

Figure 3: Percentage Distribution of Interviewee Opinions About Ease of Use
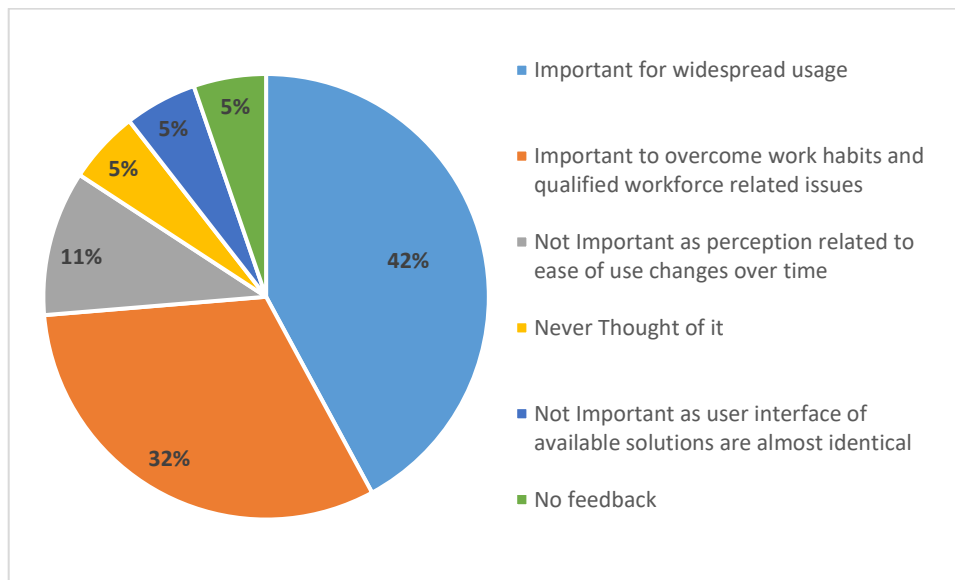
From the decision maker's point of view, perceived ease of use construct represents owners' and executives` personal beliefs on the difficulty of understanding and using ERP systems by their employees. Owners and executives are interested in approval and reporting functionalities allowing

them to use ERP systems as a decision support system. The following statements best summarize the importance of reporting functionality:

> *Interviewee M1: "Our main goal is to make money and to do that, we depend a lot on reports. If we don't have these reports, we can't make any decisions about what to do next..."*

> *Interviewee F1: "We aim to access reports effortlessly, with just one click, without depending on others... We need to easily retrieve understandable reports..."*

The importance of ease of use relies on achieving widespread usage by overcoming workforce-related organizational readiness issues. Perceived ease of is a factor reducing owners' and executives' worry about the qualifications of the employees that will use these systems.

4.4. Organizational Readiness

Organizational size is found to be by far the most important subcategory of organizational readiness.

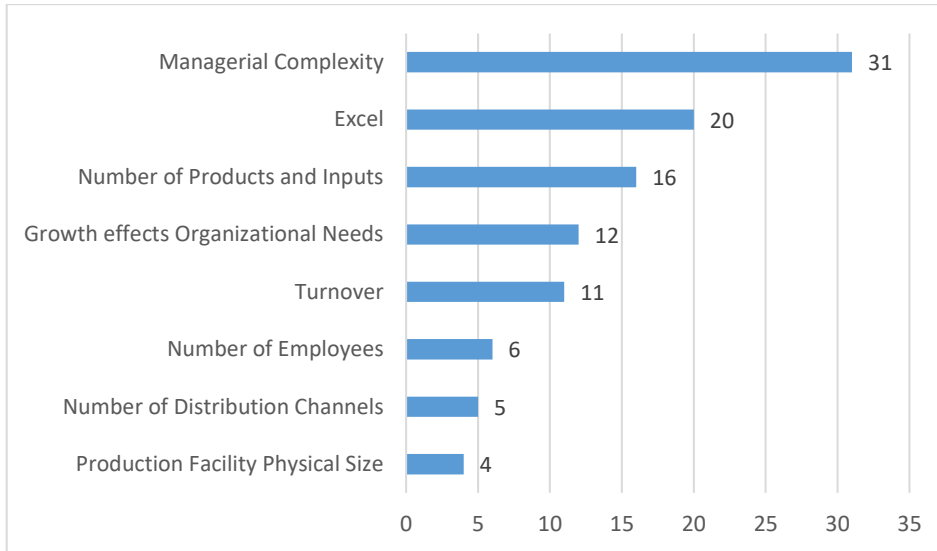**Figure 4:** Subcategories of Organizational Readiness
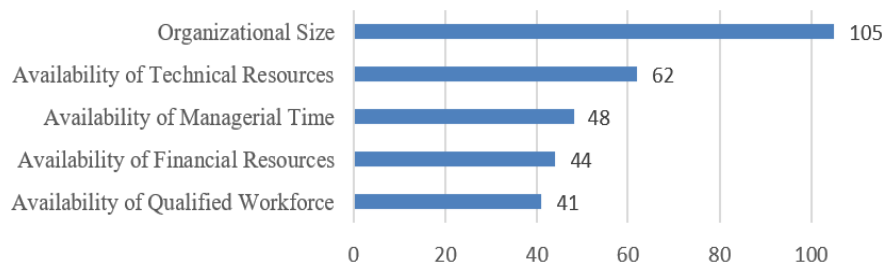
Research related to ERP system adoption indicates a direct relationship between organizational size and adoption decision (Buonanno et al., 2005; Tagliavini et al., 2002). Both the number of employees and annual turnover are found to be a consistent measure of ERP system adoption decision (Tagliavini et al., 2002). Yet, research findings recommend that for manufacturing SMEs annual turnover may be a misleading factor as it doesn`t reveal the underlying organizational characteristics leading to its realization. As exemplified by the statement of M1 and D1, Microsoft Excel-based data gathering, business planning, and reporting is initially the solution that SMEs employ.

> *Interviewee M1: "...Before we invested in an ERP system, the company was at a standstill. We couldn't analyze costs or plan for the future effectively. We relied on a mess of interconnected spreadsheets, and it created a major obstacle to our progress...."*

> *Interviewee D1: "...We currently use separate software for sales, accounting, and warehouse operations. We try to connect these systems using Excel, but it's not ideal. We lack a central platform to manage and oversee all our processes effectively..."*

Figure 5: Subcategories of Organizational Size

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The need for an ERP system as an integrated business solution arises when the merits of Microsoft Excel and/or multiple custom software solutions developed perish over time. Findings rather suggest that organizational size is an indicator of managerial and operational complexity leading to adoption decisions.

Together with the availability of a qualified workforce, employees' information technology knowledge are factors affecting ERP system adoption by SMEs (Hung et al., 2010). Employees represent the company's internal skill set to perform operations and this skill set is very important for the implementation success of ERP systems, it is the main reason for the failure of the adoption efforts (Bingi et al., 1999).

Table 4: Summary of Findings About Lack of Qualified Workforce

Company/ Interviewee	Opinion
A1, F1	***Leads to Employee Resistance:*** Uneducated employees will discredit these systems. Yet, employees knowledgeable about these systems will force their boss towards adoption.
B1, C1, I1, J1	***Leads to Employee Resistance:*** ERP systems force work habits based on documented task generation.
A1, B1, D1, E1, G1, I1, J1, K1, M1, H1	***Delays the Adoption Time***: Lack of qualified workforce having technical education/knowledge and computer literacy delays the adoption of these systems.

Supporting literature, table 4 suggests that lack of qualified workforce will have a retarding effect on the adoption of ERP systems. While the availability of a qualified workforce may have a positive effect on perceived usefulness, the lack of a qualified workforce will have a negative effect by leading to employee resistance.

Managerial time is found to be necessary for establishing internal coordination and resolving internal issues such as overcoming employee resistance to adoption, changing existing work habits, and persistence to use. For interviewees B1 and C1, the main reason for delaying ERP system adoption was

their lack of time. B1 started adoption only after his wife as a business partner returned from maternal leave. The case for companies D, J, L, and M is slightly different. They hired an external consultant to handle the implementation process. Additionally, J, L, and M were lucky enough to have senior executives to lead the adoption process. Hence, a correlation may exist between lack of qualified workforce, employee resistance, and managerial time. In other words, less employee resistance to adoption may occur as the qualification of the employees increases, thus reducing the necessary managerial time.

SMEs rely on external resources due to the lack of internal resources such as human, material, and financial (Blili & Raymond, 1993; Caldeira & Ward, 2001; Fink, 1998; Kuan & Chau, 2001) . ERP systems are adopted by organizations due to their perceived usefulness by decision-makers. If the perceived benefits cannot be achieved due to lack of resources adoption is meaningless (Kuan & Chau, 2001, p. 511). 9 out of 13 interviewed companies did either adopt an ERP system or were in the process of adopting one. They were all working with an external consultant to resolve issues related to the adoption process. Relying on outsourced support, except for companies L and M interviewed companies that did not have an internal information technology department. As illustrated with the below statement Turkish manufacturing SMEs' existing information technology infrastructure is found to be not ready for the adoption of ERP systems.

> *Interviewee M1: "...Implementing these systems on regular desktop computers will inevitably fail; investing in a server is essential. We've already put funds into computer hardware, and the adoption process is proving costlier than anticipated. Three companies have reached out, seeking guidance on adoption. I've informed them that their current hardware isn't compatible with these systems. Businesses eyeing ERP solutions must upgrade their infrastructure."*

Addressing insufficient information technology infrastructure is viewed as part of the overall adoption cost. The perceived need for technology investment is not limited to computer hardware. SME owners and executives believed that accurate data generation from ERP systems would be easier by automatically pulling data from computer-enabled manufacturing machinery. In this sense, intuitively decision makers described their need for digital transformation.

The overall cost is one of the important factors affecting ERP adoption by European medium-sized companies (Everdingen et al., 2000) . However, what might appear costly to one adopter could be inexpensive to another (Kuan & Chau, 2001).

Figure 6 suggests that although ERP system adoption may be considered an expensive investment, cost is not necessarily the primary decision criterion. The below statements further illustrate the finding.

> *Interviewee B1: "...Cost becomes a secondary consideration in the decision-making process for adopting ERP systems. Entering into the adoption of these systems inherently involves acknowledging significant expenses. Prioritizing cost as the primary concern may deter one from pursuing this route, considering it entails a substantial investment...."*

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Interviewee G1: "...Given its perceived utility to me, cost has diminished in significance as a deciding factor..."

Figure 6: Subcategories of Financial Cost
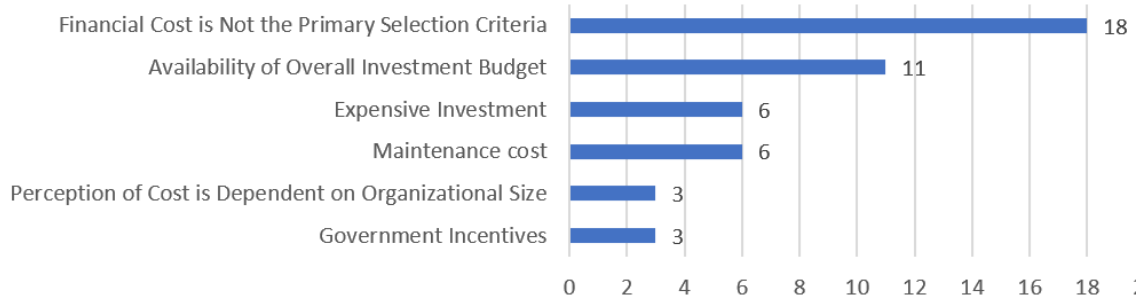
Interviewees were also aware that organizational needs change over time and that adoption of a low-cost inflexible solution may eventually waste scarce financial resources.

Interviewee C1: "...Adoption is not only about the initial investment cost. As new needs arise, it is critical to perform the necessary adjustments and updates..."

Interviewee E1:" ... The initial investment cost doesn't worry me; it's the ongoing maintenance expenses that concern me, as they tend to be high..."

Previously, companies F1, H1, and K1 opted for low-cost solutions, but these proved inadequate for their evolving needs. By the time of the interview, Company H was collaborating with a team of software developers to create its own ERP system tailored to its requirements. Company K had resorted to using an off-the-shelf solution combined with custom software. Conversely, Company F was wary of repeating past errors:

Interviewee F1: "We don't know these systems We encounter difficulty even to select production-related machinery. We only realize if our decision was correct after we've made the payments. This adds further complexity to the decision-making process. Price ceases to be the primary criterion; instead, you begin assessing how to achieve the desired results within the confines of the available budget..."

Subject to an intuitional cost-benefit analysis SME owners may decide to allocate a budget for the adoption of an ERP system. The availability of financial resources indicates the existence of a budget allocated for covering the costs associated with the adoption decision. Lack of financial resources impedes the adoption of the ERP system, yet it will not reduce its perceived usefulness.

### 4.5. Employee Resistance

Interviewee I1 tried to adopt an ERP system in the past but has been unsuccessful. Back in 2006 purchased ERP software, made the necessary hardware investment, and hired an employee experienced with the implementation of the selected solution. Ten months later the same employee resigned at his own will for being unsuccessful in breaking employee resistance to adoption. In his second attempt at

adoption, I1 has learned from his experience. He did hire an external consultant to help with the adoption process. He was also spending managerial time to break employee resistance.

Hong & Kim (2002) found an inverse correlation between employee resistance and the successful adoption of ERP systems. Supporting this finding below statement of interviewee I1 below illustrates that employee resistance to adoption is not necessarily detrimental, however may delay the adoption time.

Interviewee I1: …Back in 2006, we tried implementing the same ERP system. We invested in six months of training for everyone who would use it, from engineers to the entire workforce. We even hired a consultant as an employee to guide the adoption. However, we faced resistance. Employees were reluctant to use the system and entered meaningless data. Despite his efforts, the consultant couldn't overcome this resistance and convinced them to use the system properly. He ended up resigning, feeling responsible for the failed implementation. That marked the end of our first attempt. Now, as the boss, I'm apprehensive about getting directly involved in this new implementation effort...

Figure 7: Employee Resistance Concept Map
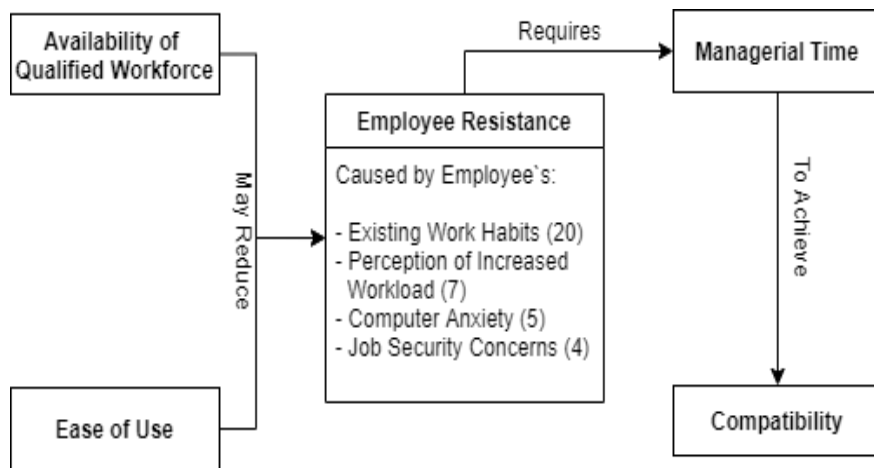
Interviewees C1, J1, and H1 addressed their concern about employee`s perception of increased workload:

Interviewee C1: (when explaining why employees will not use these systems) "Employees may resist using these systems due to a lack of education, increased workload, and insufficient communication regarding the goals aimed to be achieved with the adoption of an ERP system.

Interviewee J1:" Within our own group, we've observed some employees claiming that these systems lead to an increase in workload. Additionally, I've heard similar complaints from employees in other companies…"

Interviewee H1: They all believe that their workload will increase!

SME owners and executives believe that employee resistance to adoption is mainly due to existing work habits followed by a perception of increased workload and computer anxiety. Computer anxiety is fear of using information technology (Venkatesh & Davis, 2000). It is related to the employee`s existing qualifications. The adoption of ERP systems forces work habits based on

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documented task generation, which may induce fear of control and job security in employees. An organization`s daily operation is made of complex business activities that need to be carried out by existing employees. Adopting an ERP system will eventually require employees to change their existing workstyle. Thus, the initial perception of increased workload is normal. Participants believed that employee resistance would decrease over time. This may be explained by the compatibility level achieved with top management commitment and support.

4.6. Compatibility

A causal relationship does exist between perceived usefulness and compatibility (Moore & Benbasat, 1991). Findings support the possible existence of such a causal relationship as interviewees have declared that ERP systems comply with the way they would like to conduct their business as decision-makers:

> *Interviewee B1: "...These systems are in line with management's favored method of conducting business."*

> *Interviewee E1: "...For companies such as ours is essential for tracking business activities, as they are in line with management's preferred approach to conducting business."*

> *Interviewee K1: "... As an employer, it aligns more closely with the way I prefer to conduct my business..."*

SME owners and executives were aware that ERP systems were incompatible with their organization`s existing workstyle. Findings suggest that SME decision makers' perception related to the ease of achieving business process fit may affect the adoption decision. While customization is declared to be essential to accomplish business process fit, as exemplified by the below statements, SMEs may be more willing to comply with the default business processes defined within ERP systems.

> *Interviewee B1: "...Ninety percent of the time, we've adapted ourselves to the system, but in the remaining ten percent, we've attempted to adjust the system to fit our internal dynamics. "*

> *Interviewee D1: "...Seventy percent of the time, we've followed the system's guidelines, while in the remaining thirty percent, we've customized it to suit our needs ..."*

> *Interviewee E1: ".......Initially, the organizational structure conforms to management's preferences. However, when the ERP system does not accommodate this structure, we attempt to customize it by creating shortcuts. Eventually, these systems align the organizational structure with how it should have been in the first place"*

However, as illustrated by E1, customization included bypassing certain steps within the default business processes defined in ERP systems. Additional declarations from interviewees revealed that this may be due to the incompatibility of ERP systems with manufacturing SMEs' flat organizational structure relying on unclear roles and responsibilities. Participants perceived that adopting ERP systems requires an organizational structure with some level of mid-level management in place.

> *Interviewee C1: "...Within the current organizational structure an employee has multiple roles and responsibilities. To use an ERP system, I need to establish a mid-level management and hire new employees."*

The establishment of mid-level management is defined as "the need for additional employees", which requires the availability of financial resources. Besides, one of the interviewees described the establishment of mid-level management through the adoption of ERP systems as the equivalent of institutionalization.

> *Interviewee G1: "...Bosses, managers, experts, employees—everyone should do their job. I went ahead and put in place an ERP system with this idea in mind. I stuck to it for a while, but eventually, I had to stop. Things took a downturn recently. Because of the economy, we had to let some employees go, including managers. As the boss, I had to step up and take charge... Institutionalization costs a lot, and we couldn't keep up with it. Now, I'm all about maintaining things as they are..."*

4.7. Subjective Norms

Interviewees B1, C1, D1, E1, H1, K1, and M1 stated that the views of first-generation owners are important for the adoption of ERP systems. Interviewees D1 and H1 stated that the support from first-generation owners played an important role in their adoption decision. Interviewee E1 underlined the importance of his father`s experience as a first-generation owner in his decisions. However, as illustrated with the below statements' interviewees C1, J1, and M1 indicated that the effect of first-generation owners may also negatively affect the adoption decision.

> *Interviewee M1: "... The older generation of company owners, who are also managers, resist this investment. They're used to doing things the old way and believe that buying software is like buying a car – you just pay for it and it works. It's been a struggle to change their mindset..."*

> *Interviewee J1: "...Second-generation proprietors inherit traditions and develop their habits over time. These habits gradually shape the character of the organizations they oversee. In Turkey, companies often adopt a hierarchical structure centered around the boss, stemming from their origins as small-scale traders. As the first generation passes on their practices to the second, breaking away from these ingrained habits becomes a challenge ..."*

> *Interviewee C1:" ...Other members of the board, top managers, advisors, and even family members have limited or negative influence on this decision. None of them possess the same level of knowledge as I do regarding these matters..."*

Top management and senior employee views may also play a role in adopting these systems. Interviewees F1 and M1 stated that as a family business, they value the views and experience of their employees. Interviewee J1 was the general manager of the company. Similarly, interviewee M1 was the chief technology officer. Both interviewees have personally initiated the adoption process by convincing their employer about the usefulness of these systems.

Interviewees K1, E1, F1, and M1 have also mentioned that they value the experience of their competitors. Yet the effect of other companies in the manufacturing industry was rather related to the

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selection of which system to implement. Once the initial adoption decision is in place decision makers were trying to reach out to other companies in search of which system they should implement.

> *Interviewee F1: "…We seek references and conduct thorough analyses. Assessing the superiority of one option over another is challenging in our country…"*

> *Interviewee M1: "…a company's information technology officer, or rather, one of its warehouse employees, contacted me. They inquired about my opinion regarding Nebim, the solution they were considering implementing …."*

> *Interviewee L1: "… We've received feedback from a couple of users. We reached out to them to inquire whether we would be able to use it and if it would be beneficial for our needs…"*

> *Interviewee G1: "…Claiming that I have conducted an analysis would be misleading. I based my understanding on what I knew, what I observed, and the information I gathered from inquiries. Without seeking input from various sources, forming an accurate understanding would be impossible…"*

According to interviewees D1, E1, F1, and I1 decision makers, adoption decisions may also be affected by their customers. Interviewee E1 has declared that customer opinion and feedback are very important to them. Interviewee D1, I1, and F1 stated that observing the usefulness of ERP systems used by their major customers affected their adoption decisions. According to interviewee I1 adopting an ERP system was going to allow his company to speak the same language with their major customers.

> *Interviewee D1: "…Our client. Our primary client operates in the United States. Strengthening our ties with this client enabled us to recognize the value of ERP systems. Consequently, we have opted to implement it…"*

> *Interviewee F1: "…The long-standing use of these systems by our customers and leading companies in the industry prompted us to adopt it. Their positive impact influenced our decision to embrace these systems…"*

> *Interviewee I1: "…Our customers are global companies; they have been utilizing ERP systems for many years. They anticipate working with us in a similarly systematic manner. Upon observing their systems and operational methods, we concluded that alignment was necessary. If we fail to speak the same language, communication becomes challenging over time. Therefore, it's essential to speak the same language to maintain effective communication…"*

The effect of shareholders on adoption decisions is about receiving approval and support from them. Interviewee C1 believed that his shareholder wouldn't` approve the financial investment in these systems. Interviewee M1 as a senior executive of his company personally convinced all three shareholders of the necessity of these systems, his biggest struggle was in convincing them of the necessary financial allocation. Interviewee K1 did decide to adopt yet he couldn`t convince his partner to use the system in production-related business processes. The owners of company H were siblings. Similarly, in company B owners were married to each other. In both cases, they have simply supported each other's decision based on mutual trust.

5. CONCLUSION AND RECCOMENDATION

The study aimed to qualitatively assess the adoption of ERP systems by decision-makers in the manufacturing industry SMEs, specifically owners and executives. The analysis was guided by the Technology Acceptance Model (TAM). Drawing from previous quantitative research, interviews focused on the following key areas: Perceived usefulness, ease of use, organizational readiness, compatibility, and subjective norms.

The perceived usefulness of ERP systems comes from SME decision-makers' expectation of establishing traceable business processes. Owners and executives expect that traceability will enable them to leverage core business competencies which will eventually lead to the enablement of growth potential through accurate cost analysis.

Findings indicate that perceived ease of use may have an indirect effect on employee resistance to adopting ERP systems. A high perception of ease of use at the same time defines decision-makers trust in employees' existing qualifications. Owners and executives who perceive that employees can easily use these systems will expect less employee resistance against adoption and predict that they will spend fewer financial resources and managerial time to overcome this resistance.

Owners and executives are mainly interested in the reporting and approval functionality of ERP systems. They described these systems as empty shells allowing them to obtain reports. This empty shell needs to be customized according to internal needs and filled with accurate data by employees while they are performing daily tasks. Owners' and executives' persistent project leadership is necessary to overcome employee resistance and achieve widespread usage capable of gathering good quality data.

Customization is found to be rather limited by passing certain steps or customizing reports. By passing certain steps defined within the default business processes is identified to be caused by the lack of mid-level management. The establishment of mid-level management is defined as a need for additional employees, which requires the availability of financial resources. Ample financial resources enabling the establishment of the necessary information technology resources and reaching a much-needed qualified workforce would positively affect the adoption decision.

Owners' and executives' perceptions about the ease of achieving organizational compatibility may have a positive effect on perceived usefulness. A high perception about the ease of achieving organizational compatibility; suggesting less need for financial resources and managerial time, and less reliance on external resources; also implies a higher level of organizational readiness.

Organizational size is found to be an indicator of managerial and operational complexity leading to adoption decisions. Reaching the managerial and operational complexity that requires the adoption of ERP systems does not happen over time. Similarly, establishing business processes leading to organizational compatibility with ERP systems cannot be established overnight. SME decision-makers

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must approach training and certification-related incentives as an opportunity for transitioning their organization from transactional to process-based management systems. They should move away from the tendency of perceiving quality certifications as a document necessary for entering bids or complying with customer standards on paper. Adoption of ERP systems will be much more effortless for manufacturing SMEs capable of internalizing quality systems by adopting a process-based management approach and distributing the associated cost over time.

Figure 8: Extended TAM Reflecting Factors Affecting Manufacturing Industry SME Decision Makers Adoption of ERP Systems
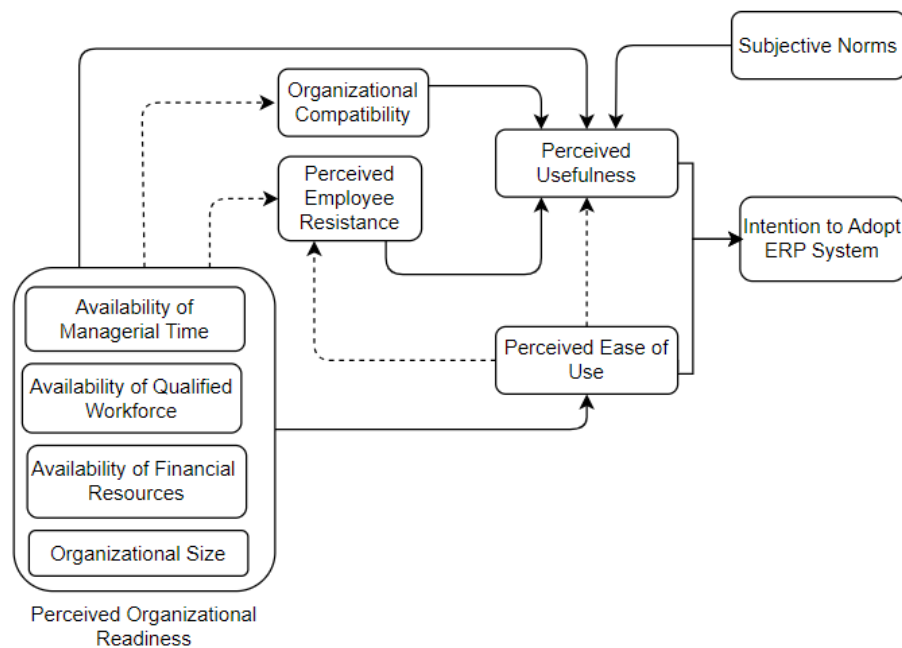
Organizational size is found to be an indicator of managerial and operational complexity leading to adoption decisions. Reaching the managerial and operational complexity that requires the adoption of ERP systems does not happen over time. Similarly, establishing business processes leading to organizational compatibility with ERP systems cannot be established overnight. SME decision-makers must approach training and certification-related incentives as an opportunity for transitioning their organization from transactional to process-based management systems. They should move away from the tendency of perceiving quality certifications as a document necessary for entering bids or complying with customer standards on paper. Adoption of ERP systems will be much more effortless for manufacturing SMEs capable of internalizing quality systems by adopting a process-based management approach and distributing the associated cost over time.

Finally, the initial adoption decision may be affected by: The views of other companies in the manufacturing industry, customers, top management and senior employees, first-generation owners, and business partners. The effect of other companies in the manufacturing industry is found to be related to

the selection of which system to implement. SMEs lack a structured approach to evaluate and select ERP systems, preferring subjective norms instead.

This research is focused on manufacturing SME owners and executives. SME decision-makers in other industries may face different challenges. It was rather difficult for the participants to identify unfavorable factors affecting the adoption of ERP systems. The factors mentioned, such as employee resistance, primarily constituted internal factors and were thoroughly depicted. Future research could explore how environmental factors, such as economic and political uncertainties, affect the adoption decision.

AUTHOR DECLARATIONS

For the study, ethics committee permission document dated April 5, 2018 and numbered 28620816/189 was obtained from Middle East Technical University Human Research Ethics Committee.

The first author contributed 70%, and the second author contributed 30%.

The study has been crafted in adherence to the principles of research and publication ethics.

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