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Enhancing IT Capability Maturity – Development of an SME Framework to Maximize the Value Gained from IT

Abstract

The Small and Medium sized Enterprise (SME); defined by the European Commission (2005) as any firm with less than 250 employees, is acknowledged as a fundamental component in the success and growth of any economy. Given the very difficult global economic conditions we are faced with, it is essential that this sector is supported and continues to thrive. In tandem with these difficult economic conditions, monumental technological advances are happening almost on a daily basis. These advances impact and change how businesses need to operate and SMEs must keep abreast of these advances and better understand how to remain competitive in such a difficult and fast moving environment. Given the resource constraints such as time and access to finance that are inherent in the small firm, maintaining this competitive edge proves increasingly difficult. This paper seeks to examine the key business challenges faced by SMEs around their Information Technology (IT) or Information and Communications Technologies (ICTs) in this current climate. It also seeks to determine the IT capabilities that firms are most interested in seeing improvements in. This is done through employing a quantitative research approach to the data collection (questionnaire) and analysis processes. Through analysis of this data, an SME IT Capability framework (SME IT-CMF) is conceptualised to facilitate maximum value to be gained from IT. This paper will make a number of practical recommendations. Firstly, these recommendations are of value to the knowledge base, secondly to SMEs themselves, in helping them understand how they can improve their competency in a number of key IT areas or critical capabilities (CCs). From a government perspective it will identify the key areas that require support for the SME in an effort at maintaining and promoting economic growth. This research primarily relates to SMEs within the Knowledge Intensive Business Services (KIBS) Sector and those organizations which are medium sized having in excess of 50 employees.

KEYWORDS: SME, Technology adoption, Value from IT, IT-CMF, CIBS

1 Introduction / Literature Review

ICTs…are facilitating the globalization of many services…[and] is having a fundamental impact on the way economies work and on the global allocation of resources, contributing to productivity growth by expanding markets, increasing business efficiency and reinforcing competitive pressure (OECD, 2008, p.5).

The current economic climate has never been so competitive; the increasing rate of technological advancement, access, and ease of use has seen many 'well known' organizations struggling, and indeed failing to stay competitive and viable. Consequently, many need to review their current market position, product and/or service offering, and their competitive landscape (McLaughlin, 2012). Companies are faced with significant business challenges and are increasingly focused on survival and on remaining competitive in this very volatile economy (PWC, 2013; Rosenberg, 2012). They are challenged in building and maintaining customer loyalty and relationships (PWC, 2013; Cisco, 2013), are challenged in effective budget management (Cisco, 2013) and in ensuring that they have the right talent required to succeed (PWC, 2013). It is purported that what made firms successful in the past may no longer hold true for the future. *"For those organizations that are determined to succeed in this hypercompetitive and dynamic market, the need to better sense and respond to market forces becomes a survival imperative"* (McLaughlin, 2012, p.4). With the many significant advancements in IT, taking into account Moore's Law (Curley, 2004), an effective IT capability enables organizations to overcome the many diverse business challenges, traditional barriers to market are eased creating opportunities for *"newer, smarter, more agile organizations to gain a dominant position against well known and established organizations"* (McLaughlin, 2012, p.1). A significant amount of research has focused on how IT can address the many business challenges facing organizations. These include addressing issues pertaining to relationships with trading partners (Tan et al, 2010), enabling cost savings (Harrigan, 2008), improvement in levels of productivity, efficiency (Harrigan, 2008), improved access to extensive market information and business knowledge (Tan et al, 2010; Xu et al, 2007), enhanced capacity to target clients on a local, regional or global level (Tan et al, 2010; Kotelnikov, 2007; Alam et al., 2005) and improved competitive advantage (Mora-monge et al, 2010; Harrigan, 2008). IT also facilitates improved SME co-operation and competition with larger firms in a wide range of markets (OECD, 2008). Findings also suggest that the value or benefits derived from IT may vary depending on the particular sector and size of the organization (Micus, 2008). So how can the organization harness maximum business value from its IT or address the many diverse business issues it is confronted with? It is purported that for IT to move up the value ladder, it must achieve a specific level of performance within the organization (Curley and Delaney, 2010). Figure 1 depicts this notion and illustrates how firms at a lower level of sophistication focus on issues surrounding their IT infrastructure. It further illustrates that as their level of sophistication improves this IT focus incorporates the operational issues of the firm.

Figure 1: IT Value Proposition
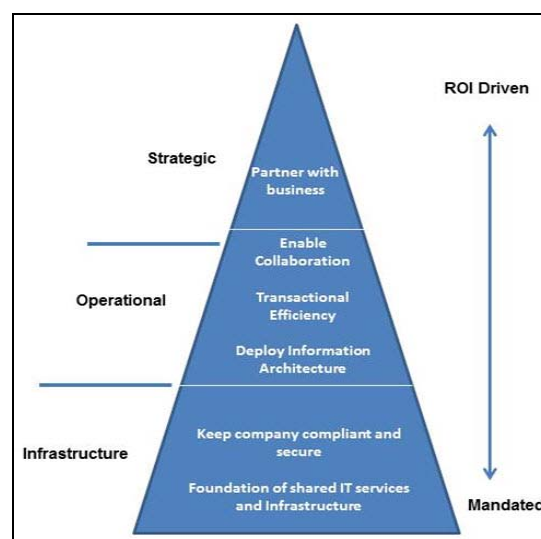
Source, Cooney, 2009

At the highest level of sophistication organizations are concerned with issues pertaining to IT strategy such as how best to align or partner with business and in delivering maximum value from the IT capability of the organization. There are a number of frameworks that support improvements in the IT performance of the organization and enhance the value gained from IT (Cooney, 2009). There are two distinct lenses through which these frameworks can be viewed in order to determine which approach is most appropriate to a specific organization. These can be termed "Process-centric" or "Capability-centric" frameworks.

"Process-centric frameworks are focused on developing an ability to produce a desired, repeatable output to a predetermined quality and quantity. Capability-centric frameworks are designed to understand what organizational abilities can, and should be developed to support and build a unique and sustainable competitive advantage. Process-centric frameworks are very much focused on systemizing internal activities, whereas capability-centric frameworks effectively respond to (as yet undefined) external challenges" (McLaughlin, 2012, pp.3-4).

This research will build upon a capability centric framework namely the IT-Capability Maturity Framework (IT-CMF), (IVI, 2013). The framework:

- Maps IT organizations onto a capability maturity curve based on empirically derived industry best practice across 33 different capabilities of IT management.
- Provides practices, outcomes and metrics to improve capability maturity and therefore consistency of output.
- Enables organizations to assess and benchmark performance over time.
- Enables creation of roadmaps with actionable metrics to improve maturity with best practice guidelines.
- Provides capability accelerators and building blocks for improvement (IVI, 2013).

The IT-CMF purports that IT is used as an innovation resource, helping improve the probability, predictability and profitability of IT-enabled innovations. The framework is developed based on five levels of IT maturity across 33 critical capabilities and four interrelated macro-capabilities within the organization (see Figure 2), which can be employed to maximise information technology for business value. Using the IT-CMF "*CIOs can help drive four types of improvement shifts for IT capability:*

- *Move the business model of the IT capability from a cost centre to a value centre.*
- *Move the IT Budget from a runaway scenario to a sustainable economic model.*
- *Move the value focus from purely measuring total cost of ownership to demonstrating optimized value.*
- *Move the perception of IT from that of a supplier to that of a core competency".*
(Curley and Delaney, 2010, p.4)

Figure 2: IT Capability Maturity Framework

Maturity Levels	Managing the IT Budget	Managing the IT Capability	Managing IT for Business Value	Managing IT like a Business
5 Optimizing	Sustainable economic model	Corporate core competency	Optimized value	Value Centre
4 Advanced	Expanded funding options	Strategic business partner	Options and Portfolio management	Investment Centre
3 Intermediate	Systematic cost reduction	Technology expert	ROI and Business case	Service Centre
2 Basic	Predictable performance	Technology supplier	TCO	Cost Centre
1 Ad Hoc	Beginning			

However, while the value of the IT-CMF is clear for the organization, it has been developed with the large firm in mind and similar to a lot of ICT related research pertaining to the organization (Loebbecke et al, 2012; Iyer and Henderson, 2010; Gronroos, 2004), the focus is on the larger organization with scant attention paid to the SME (Doherty, 2012; Spurge and Roberts, 2005).

SMEs have historically been the hidden engine of many national economies, but they have not necessarily operated on the 'bleeding edge' of technology (BCG, 2010, p.24).

SMEs are recognised as being inherently different (Street and Meister, 2004) and cannot be seen through the same lens as the larger organization (Ballantine et al, 1998). They form a cornerstone of the EU economy representing 99 percent of all enterprises (European Commission, 2012). Given this instrumental role played by SMEs in contributing to socio-economic development (Tan et al, 2010) and recognition of the value that IT can bring to any organization in ensuring it can compete in today's challenging business climate (McLaughlin, 2012b), development of an IT framework to help support this value generation is warranted. Previous research has highlighted this gap in that previous attempts to develop guidelines to govern IT in SMEs, such as the Cobit Quick Start (IT Governance Institute, 2007) have proved disappointing (Devos et al, 2012). In essence, this paper endeavours to highlight the key IT Business challenges currently facing SMEs. It will also identify the key areas or Critical Capabilities which will best address these challenges. This will form the basis for the development of the SME IT-CMF.

2 Methodology
2.1 Research Approach

A quantitative research approach was adopted through the employment of an online survey instrument (questionnaire). The unit of analysis in this research is the Small to Medium sized Enterprise (SME). The sample frame was developed through the use of a stratified random sampling technique and was ultimately driven by the nature of the research questions (Saunders et al, 2007). This technique helped gain representation from all sectors (Harrigan et al, 2008). The sampling frame was stratified according to one main criterion in that firms must be considered an SME (having less than 250 employees). The research adopted an equal sectoral focus based on previous research (Grosso, 2006) which found the adoption of Internet technologies to have a positive impact on SME business activities. The study's sample consisted of 1500 SMEs. The researchers aimed for a response rate of 7 percent in order to achieve 100 usable responses which is deemed a suitable minimal level in a large population (Harrigan, 2008). Resultantly, the data collection process generated 134 usable responses achieving a response rate of 9 percent.

2.2 Instrument Development

The survey questionnaire was designed and developed following an extensive review of the pertinent literature in this area. In essence, the questionnaire served to inform the following key research questions:

- RQ1, Identify the key IT business challenges facing SMEs.
- RQ2, Determine the key IT related areas (Critical Capabilities) for SMEs.

2.3 Operationalization of Constructs

Considerable influence was drawn from other frameworks which focus on maximising the value gained from IT for the larger firm, namely the IT Capability Maturity Framework (IT-CMF) (IVI, 2013). Further, key IT challenges were identified from the literature (Cisco, 2013, PWC, 2012. Rosenberg, 2012, Protiviti, 2011) in order to ensure the SME framework effectively captured and identified the real issues faced by SMEs in the current climate. However, whilst considerable value was derived from this review of the literature, as aforementioned, the majority of this research focused on the large firm and as such there was a need to refine the constructs to enhance their relevance and comprehension in the SME environment. This was achieved through employing a pre-test phase in the research process, where a sample of 20 SME owner/ managers and a number of senior academic and industry experts helped streamline the final questionnaire. As a result of this pre-test process, constructs and the language used were refined to enhance relevance and comprehension in the SME environment. In terms of the constructs themselves, the survey instrument consisted of a combination of open-ended, closed questions and 5 point Likert scales. The small number of open ended questions invited free comments where it was not always possible to predict the range of responses to a particular question (Frary, 1996). Use of closed questions served to generate and gather information quickly by the researcher (Boynton and Greenhalgh, 2004). Five point Likert scales were used in the survey instrument where an expression of either a favourable or an unfavourable expression was required in response to a particular statement (Blumberg et al., 2008). The five point scale was adopted as it is purported that respondents have a preference for numbers that can be divided by 'five', it facilitates greater information gathering and increased accuracy (Saris and Gallhofer, 2007) with 'strongly disagree' associated with number '1' on the scale and 'strongly agree' associated with number '5'. Many SMEs tend to be controlled by the owner managers in a highly personalised with a greater diversity of owner objectives. As such the motivation of the owner manager is increasingly recognised as a key factor in small firm performance (Fillis and Wagner, 2008), they were selected as the main point of contact in this research and were recognised as being in the best position to comprehensively answer questions relating to most business issues (Carson and Gilmore, 2000).

2.4 Quantitative Data Analysis

The data analysis techniques employed in this study were driven by the nature of the research questions. Given the exploratory nature of these questions, both univariate and bivariate data analyses techniques through descriptive statistics (Onwuegbuzie and Leech, 2005) proved to be meaningful and illuminative. Analyses were conducted using the program SPSS for Windows™ (Version 19). This analysis provides the researcher with a deeper insight into the area under investigation and provides a direction for further research (Cameron and Price, 2009). The key findings are now presented in the Findings and Discussion section below.

3 Findings and Discussion

This section presents the key findings in respect of the earlier outlined research questions (section 2).

3.1 Profile of SME Respondents

The survey provided 134 usable responses. Each respondent organization employs less than 250 people. More specifically, in terms of the size of the respondent firms, 29 percent (n=39) are micro firms (1-9 employees), 28 percent (n=37) are small (10-49 employees) and 43 percent (n=58) are of medium size with 50-249 employees (see Figure 3).

Figure 3: Respondents by firm size

Figure 3   Respondents by firm size (n=134)

- Micro (1-9 employees)
- Small (10-49 employees)
- Medium (50-249 employees)
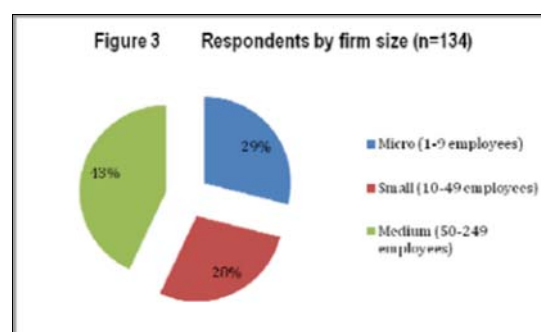
In terms of industry sectors, the respondents are broken down as follows (see figure 4): the largest sector, represented by more than half of all respondents (52 percent, n=69), are those firms from the Knowledge Intensive Business Services (KIBS) sector. Included in this category are those industries that rely heavily on the use of professional knowledge, for example, computing/ IT, accounting and tax consulting, marketing, advertising and legal activities (Muller and Doloreux, 2007). This is followed by a

significant number of firms (27 percent, n=36) from the service sector, which include those firms from retail / wholesale, and the hospitality sector. Finally, the minority of respondent firms are from the manufacturing sector (22 percent, n=29).

Figure 4 Respondents by Sector (n=134)

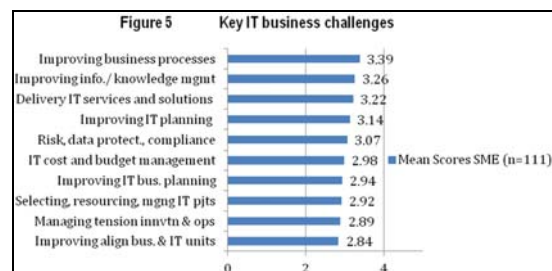- Service 52%
- KIBS 27%
- Manufacturing 22%
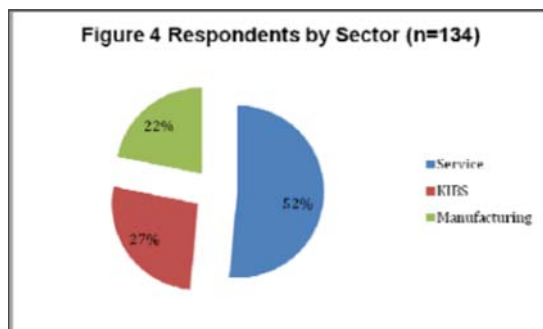
In summary, these findings illustrate that in line with previous research (Micus, 2008) this research is of particular importance to SMEs from the KIBS sector and to those 'larger' SMEs who have in excess of 50 employees, as their needs for such a framework may be more pronounced.

3.2 RQ1, Identify the IT Business Challenges facing SMEs

This section presents and examines the key IT business challenges that were identified by respondents. A list of 19 IT business challenges (informed by the literature) was presented. SMEs, in general, display moderate agreement to the existence of business challenges relating to IT (mean=3.06), the top 10 challenges as identified by respondents are outlined below (figure 5). Figure 5 shows the considerable range of agreement to the IT business challenges faced by SMEs. What is apparent from the findings is the prominence of perceived IT business challenges, (in fact 50 percent) that relate to internal day-to-day management and operational issues facing the SME. The key challenge highlighted is in improving business processes (mean 3.39), this is followed by the perception by SMEs that they experience challenges in improving information and / or knowledge management (mean = 3.26) and in the selection, resourcing and management of IT projects (mean=2.92), in managing the 'tension' between encouraging IT innovation and day-to-day operations (mean=2.89) and in improving alignment and the relationship between business and IT units (2.84). Further, SMEs perceive additional challenges related to the management of their IT infrastructure. This is evident through firms indicating that improving IT risk management, data protection and compliance (mean=3.07) are considered key IT business challenges for them. Additionally, they are also concerned with the delivery of their IT services and

solutions to meet business needs (mean=3.22). These findings show that the primary IT challenges facing respondent SMEs pertain to operational issues such as dealing with the day-to-day running of their IT within the organization. In addition, findings show that SMEs are challenged in the management of their IT infrastructure and ensuring that the hardware and software solutions that are in place work as they are supposed to and indeed support the needs of the IT and business units. In addition, there is also a perception among SMEs that they are challenged in their IT supporting the strategy of the firm. This is apparent through the indication by respondents that they perceive themselves to be challenged in improving IT planning to meet business needs (mean=3.14) and in them improving IT business planning (mean=2.94). These findings show how firms appreciate the importance of IT business strategy to their organization but feel they are challenged in implementing such a strategy. However, whilst this strategy is important to them it is not foremost in the minds of firms in managing their overall IT capability. Budgeting for their IT is also a concern for SMEs as they express a perceived challenge in their IT cost and budget management processes (mean=2.98). However, it must be noted that this ranks 6th on the top 10 Key IT business challenges facing SMEs and whilst it is recognised as a key concern it is not foremost in the mind of respondent SMEs. This is not to say that SMEs are less concerned about budget management - they may, in fact, feel that they have this capability more under control than, for example, improving business processes. Overall these findings show that firms perceive they are most challenged in their day-to-day IT operations and in maintaining their existing IT infrastructure. Management of their IT strategy is perceived as less important to SMEs in this study. Taking into account the IT Value Proposition model put forward by (Cooney (2009) (section 1.0), it is evident that in terms of focus on gaining maximum value from their IT, organizations need to move to the next level and focus more on management of their IT strategy in order to maximise the business value or return they receive on their IT investment.

Figure 5 Key IT business challenges

Challenge	Mean Scores SME (n=111)
Improving business processes	3.39
Improving info./ knowledge mgmt	3.26
Delivery IT services and solutions	3.22
Improving IT planning	3.14
Risk, data protect., compliance	3.07
IT cost and budget management	2.98
Improving IT bus. planning	2.94
Selecting, resourcing, mgng IT pjts	2.92
Managing tension innvtn & ops	2.89
Improving align bus. & IT units	2.84

3.3 RQ2, Determine the Key IT Areas (Critical Capabilities) for SMEs

This section presents and examines the key IT related areas or Critical Capabilities (CCs) that were identified by respondents. A list of 35 CCs (adapted from the IT Capability Maturity Framework) was presented to respondents. SMEs, in general display moderate agreement with regard to the importance of a number of key CCs (mean=3.17), these are outlined in Figure 6.

Figure 6: Key IT areas / Critical Capabilities
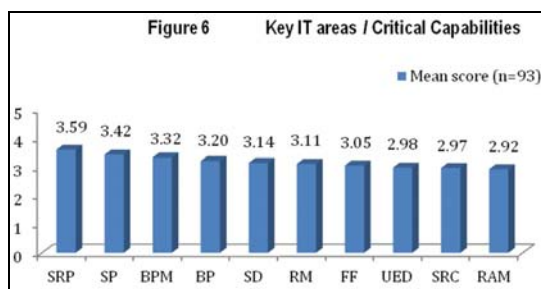
The area or Critical Capability (CC) deemed most important to SMEs in this study is Services Provisioning (SRP), (mean =3.59). This is followed by Strategic Planning (SP) (mean= 3.42), Business Process

Management (BPM), (mean=3.32), Business Planning (BP), (mean=3.20), Solutions Delivery (SD), (mean=3.14), Risk Management (RM), (mean=3.11), Funding and Financing (FF) (mean= 3.05), User Experience Design (UED), (mean=2.98), Sourcing (SRC) (mean=2.97), and finally Relationship Asset Management (RAM), (mean= 2.92). These Critical capabilities identified by respondent SMEs as being most important to them may suggest that they are most interested in improving their capabilities in aligning IT to business in areas pertaining to (in order of importance) their operational, strategic and infrastructural capabilities. This finding corroborates and compounds the earlier findings pertaining to the key IT business challenges experienced by the SME.

3.3 Synthesis of Key IT Business Challenges & Key Critical Capabilities

The key IT Critical Capabilities (CCs) identified by SMEs were then cross referenced with the key IT business challenges. Accordingly, a final list of critical capabilities was identified (see Table 1 below).

Table 1: Description of CCs selected for inclusion in the SME IT-CMF

SME IT-CMF Critical Capability	Current Definition
Service Provisioning (SRP)	The capability to execute IT services to satisfy business requirements. Services comprise a combination of people, processes and technology and are typically defined in a Service Level Agreement.
Strategic Planning (SP)	The capability of formulating a long term vision and translating it into an actionable Strategic plan for the IT Organization.
Business Process Management (BPM)	The capability to identify, design, document, monitor, optimize and assist in the execution of an organization's processes by specifying and implementing enabling policies, methods, metrics, roles and technologies.
Business Planning (BP)	The capability to produce an approved document that describes tactical objectives and operational services to be provided, as well as the financial and non-financial constraints that apply to the IT function for the coming planning period.
Solutions Delivery (SD)	The capability to specify, design, implement, validate and deploy solutions (both hardware and software) that effectively address the organization's IT requirements and opportunities.
Risk Management (RM)	The capability to assess, monitor and manage the exposure to and the potential impact of IT-related risks.
Funding and Financing (FF)	The capability to provide a company-wide understanding of how, why and from where IT is funded.
User Experience Design UED)	The capability to manage the design and evaluation of technology solutions in a way that supports the needs of the organization and the end user.
Sourcing (SRC)	The capability to evaluate, select, and integrate providers of IT services according to a defined strategy and model.
Relationship Asset Management (RAM)	The capability to analyse, plan, and enhance the relationship between the IT Organization and the Business.

4 Conclusion / Recommendations

This research has shed some light on an area deficient of empirical research by undertaking a study into the key IT business challenges facing SMEs and IT critical capabilities of most importance to them. Through this research, the primary IT

critical capabilities of relevance to the SME have been disseminated and will form the basis for the development of an SME capability centric framework (SME IT-CMF) designed to enhance the business value gained from the IT investment of the SME. Findings indicate that this framework is

likely to be of most interest to firms within the Knowledge Intensive Business Services (KIBS) sector and to those firms with in excess of 50 employees. The primary IT challenges and capabilities identified by respondents pertain to the alignment of the IT and business units in management of the day-to-day operations of the organization, with less focus on the strategic aspects of IT. It remains to be seen whether this lack of strategic focus has any impact on the value derived from their IT capability. This current phase forms the initial groundwork in the development of the SME IT-CMF framework. The next phase will focus on the development of the existing IT-CMF framework to suit the SME context. Further, validation of this framework will be achieved through employing an in-depth qualitative research approach which will provide deeper explanation and understanding of the many issues raised and will determine the relevance and validity of the framework for the SME environment. This study will also offer practical guidelines to SMEs surrounding the IT Critical Capabilities that require improvement in order to maximise the value they gain from their IT. Further, from a government perspective this research informs policy makers of the key IT challenges facing SMEs in order to ensure adequate supports and education progammes are implemented and rolled out and to help to maximise the return on investment or business value gained by SMEs from their IT.

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The Innovation Value Institute (IVI) is a multi-disciplinary research and education establishment co-founded by the National University of Ireland Maynooth and Intel Corporation. IVI develops frameworks to assist IT and business executives to manage IT for Business Value and to deliver IT-enabled business innovation. IVI is supported by a global consortium of like-minded peers drawn from a community of public and private sector organizations, academia, analysts, professional associations, independent software vendors, and professional services organizations.

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