Collaborative working in South African construction: contractors' perspectives

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Abstract

Purpose – The purpose of this paper is to assess the level of collaborative working among project partners in South African construction. The construction industry is made up of a plethora of entities trading as consultants, contractors, subcontractors, suppliers and manufacturers. The effort and contributions of these entities with the input of clients result in completed projects. However, the performance of the industry has continued to generate more negative, rather than positive, headlines. Typical headlines include defects, rework, delays, injuries and accidents, all of which are mostly blamed on the endemic fragmented nature of the industry.

Design/methodology/approach – The assessment was undertaken through a quantitative survey conducted among general contractor (GC) members of the Master Builders South Africa.

Findings – Selected findings relative to the research include short-term objectives and price-oriented approach are prevalent in the industry; poor problem-solving mechanisms exist between project partners; poor use of modularisation; significant numbers of irregular clients and rigid adherence to contents of contract data.

Research limitations/implication – The research findings provide an insight rather than definitive information due to the limited response rate of the survey.

Originality/value – The paper concludes that contractors should embrace collaborative procurement methods to improve performance and promote innovation in the industry.

Recommendations include the availability of a consistent work load for the supply chain members as well as the improvement of the relationship between project partners, especially between contractors and their subcontractors/suppliers.

Keywords Collaboration, Construction, Contractors, Project partners, Supply Chain, South Africa

Paper type Research paper

1. Background

The construction industry's attempt to improve its performance through partnering and the integration of the supply chain played a pivotal role in ensuring positive project outcomes in the UK (National Audit Office, 2001). Cooke and Williams (2004) suggest that smaller and more integrated supply chains are the answer to demands from clients for increased productivity from the industry and greater regard for completion on time,

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budget certainty and higher standards of quality and health and safety (H&S). They opine that the management of the supply chain aims to promote collaboration through leadership, facilitation, training and incentives and replace short-term, contractually driven, project by project, adversarial relationships with a long-term, multi-project relationship, based on mutual trust and co-operation.

Further, Cain (2003) suggests that the fragmented state of the construction industry, particularly in the UK, is a direct result of its historical development. He cites a number of reports that document the fragmented organisational structure of the construction industry, which, in turn, prohibited the development of efficient supply chain relationships. However, in spite of the release of performance-related reports, the industry has continued to witness increased fragmentation in various forms (Harding, 2010).

Usually, fragmentation starts upstream of the supply chain and extends downstream with principal contractors mainly engaged in supervision of their subcontractors and suppliers. The resulting proliferation in subcontracting has therefore further complicated the relationship within the construction supply chain through increased fragmentation of the production process (Dainty *et al.*, 2001).

The South African construction experience is not significantly different from that of the UK. For example, the South African government's White Paper that provided the platform for the establishment of the Construction Industry Development Board (CIDB) (2004) identified interconnected structural problems such as fragmentation and specialisation as part of the impediments to the growth of the industry (Republic of South Africa, 1999). The CIDB (2004) equally contends that the South African construction industry has identified disintegrative behaviour, or rather fragmentation as the root cause of many problems in the industry. These reports and empirical findings support the call for the adoption of concepts inherent in supply chain management (SCM). Benton Jr. and McHenry (2010) contend that SCM, which can be defined as the strategic management of information flows, activities, tasks and processes, involving various networks of independent organisations and linkages which produce value that is delivered to project owners in form of a finished project, offers significant promise for the construction industry.

In addition, Fearne and Fowler (2006) suggest that the construction industry can improve its project management and efficiency through a more integrated and customised approach by the adoption of lean principles. These lean principles entail fundamental changes in relationships, and management of the relationships between clients, contractors and subcontractors. The changes are intended to allow projects to be delivered faster, and also to improve profitability for all firms involved in the construction process (Fearne and Fowler (2006). Benefits that accrue through working collaboratively are evident in the research conducted by Ansell *et al.* (2009), which indicates that the engendered collaborative working relationship between project partners involved in a major multi-project highways maintenance scheme in the UK contributed to tangible improvements and savings in terms of time predictability, construction H&S, defect-free work, shorter project duration, lower cost, fewer number of compensation events, innovations, respect for people and overall client satisfaction.

2. South African construction

Over the past decade, the construction industry in South Africa has undergone several changes in its structure. This is perhaps a response to changes in the local environment

occasioned by the upsurge in contracting activities financed by both public and private sectors of the economy. For example, a typical construction site visit will indicate the amount of firms involved in the production process. However, this phenomenon leads to reduced main contractor size, increased numbers of subcontractors and increased fragmentation, which, in turn, significantly impact on the operational capacity of contractors (Shakantu *et al.*, 2007).

The reduction of scope of operations occasioned by a reduction in size creates two effects. First, smaller firms start to operate with care, concentrating on the micro rather than macro view of their business, a situation that significantly impacts the ability of these smaller firms to adopt best practices in the construction process. Second, smaller firms move into an economic mindset that emphasises short-term profits, rather than investment on longer-term integrative and strategic approach to operations (CIDB, 2004). In fact, the multiplicity of design, management and production responsibilities with attendant shortage of necessary skills is clearly eroding best value in public sector service delivery (Bowen *et al.*, 2007).

Therefore, it follows that the research problem statement adopted for this research states that the non-integration of the construction supply chain hinders the creation and improvement of value in the construction process. This is based on the premise that fragmentation/discontinuities in the construction supply chain leads to recurrent poor project performance, stakeholders' dissatisfaction and inherent distrust among project partners.

The underlying theme to the research is that improved relationships and integration of key stakeholders are critical to addressing the perceived ills of an industry that is underperforming, inefficient, unproductive, fragmented and wasteful (London and Kenley, 2001). Collaboration can also have numerous benefits such as improved working relationships, effective information exchange, less conflicts and risks, higher productivity, cost savings, improved quality, faster processes and better customer responsiveness (Hinks *et al.*, 1996 cited by Akintoye and Main, 2007). Accordingly, the research objective is centred on the need to explore the dynamics of the industry with respect to fragmentation and collaboration to determine the extent of structural problems in the industry, and contractors' awareness relative to collaboration. In this context, "collaborative working" refers to the ability of firms, work teams and individuals to agree upon mutual objectives, decision-making processes and problem resolution systems while focusing on specific improvements to their normal performance in project undertakings (Bennett and Peace, 2006).

3. The research

3.1 Research method

The primary data used in the study were acquired through a self-administered structured questionnaire. The population comprised general contractors (GCs) who are members of the Master Builders South Africa. The sample size comprised 108 construction firms. After a survey period, only 26 responses were received and included in the analysis of the data, which equates to a response rate of 24.1 per cent. Though the response to the survey was not so high, the rigor associated with quantitative survey method was adhered to. Specifically, the sample size was generated through systematic sampling method, all the data collected in the similar manner and the analysis of the data was consistently controlled in accordance with guidelines suggested in

Leedy and Ormrod (2005). Therefore, in spite of the response rate achieved in this study, the study was properly designed, and strict protocol execution was observed throughout the study.

In addition, the research addressed the population because within a typical construction supply network, the main contractor at the centre of the hub acts as links to the client, main supply agencies and to both design and any specialist management services (Dainty *et al.*, 2001).

Basically, the research questionnaire addressed the nature and/or type of structural problems in the industry, and also examined the impact of collaborative working on the supply chain of GCs. Because the questionnaire was intended to serve as a comprehensive source of primary data, it was designed based on findings in the literature review. For instance, the questionnaire consisted of sections that addressed questions relative to respondent's demographic background and their perceptions in terms of problems in the construction process as well as their familiarity with collaborative working in construction. Specifically, common problems in construction were adapted from Fewings (2005) as indicated in Table I, and other literatures that documented barriers to, and enablers of, continuous improvement in the construction process (Bennett and Peace, 2006; Akintoye and Main, 2007).

The results indicate that 84.6 per cent of the respondents work for main contractors, while 15.4 per cent worked for subcontractors (Figure 1); 53.8 per cent of the respondents have less than six years industry experience (Figure 2), and 53.8 per cent of the

Relationship	Processes	Customer focus
Lack of trust leading to conflict	Fragmented nature of the design process	Fragmented nature of the construction process and poorly integrated value chain
Onerous contract conditions and unfair loading of risk	Inadequate design period	Insufficient focus on internal and external customer requirements
Lack of understanding of the risks involved and their consequences	Inadequate design information	Ambiguous tender packages
Unfair selection procedures	Poor overall planning with inadequate lead time	Insufficient understanding of specialist contractors requirements
Unfair payment procedures and failure to view subcontractors as equal project partners	Fluctuations in demand for the products and services of the specialists	Unclear statements of requirements and ambiguous project information and tender packages
Perceived poor status of specialist contractors	Failure to involve sub contractors early enough in the process	

Source: Adapted from Fewings (2005, p. 329)

Table I.
Main problems of construction

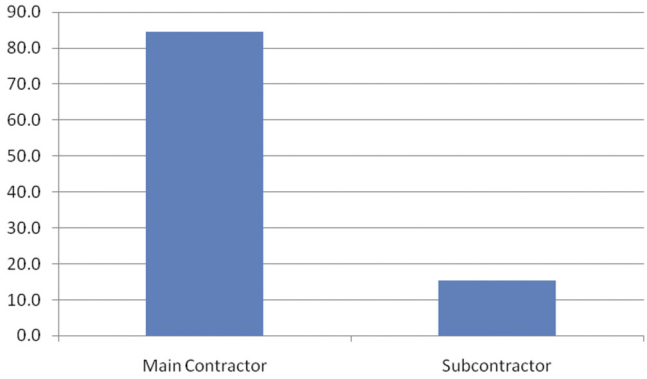

Figure 1.
Respondents' type of organisation

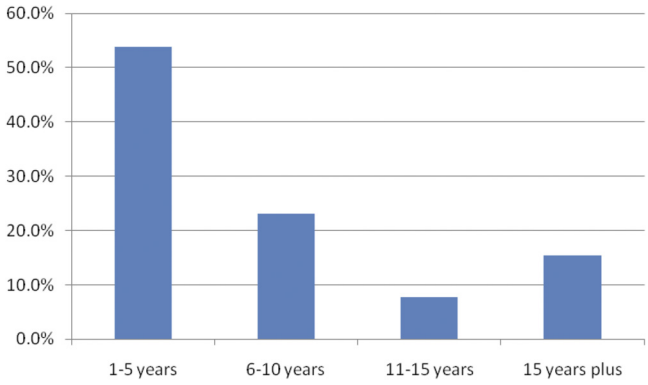

Figure 2.
Respondents' years of construction experience

respondents are site management employees of their respective organisations (Figure 3). These demographic data seem to suggest that in spite of the low response rate recorded in the survey, the data generated through the survey emanate from active construction industry practitioners.

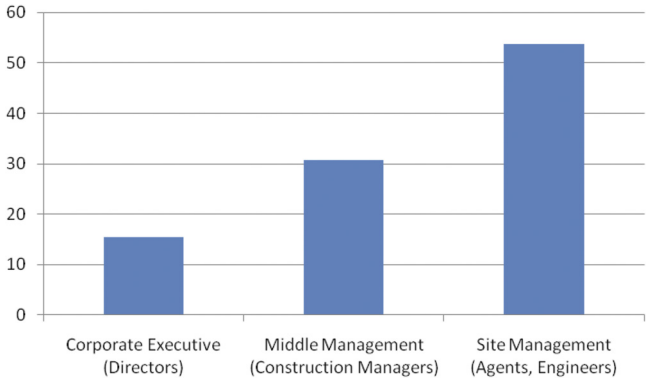

Figure 3.
Management levels of respondents

3.2 Structural problems in construction

Fewings (2005) contends that the main problems in construction may be categorised in terms of the relationships within a supply network, the nature of construction processes and the ability to drive the construction process through the needs of the customer. He says relationship problems include lack of trust, onerous contract conditions and unfair loading of risk, unfair selection procedures, unfair payment procedures and failure to accept subcontractors as equal project partners and perceived poor status of specialist contractors. According to him, construction process and/or customer focus-related problems include fragmented nature of the design process, inadequate design period, inadequate design information, poor overall planning with inadequate lead time, fluctuations in demand for the products and services of the specialist, failure to involve subcontractors early enough in the process and unclear statements of requirements.

Understanding these problems and seeking solutions to them entail the understanding of the construction industry, in which project organisation is predominantly temporary, the products are one-of-a-kind and the production is on-site and full of high levels of complexity (Vrijhoef and Koskela, 2005). The construction process is thus essentially project-based, and the project itself can be considered as a temporary multi-firm setup. Therefore, due to the specialisation of the work and the fragmentation of the overall process among supply chain members, it is not possible to assume that a single firm would have the power or the ability to individually coordinate the whole supply chain, but every member of the chain can influence, and be influenced by the whole supply chain (Isatto and Formoso, 2006). This ability to influence/or manage relationships may lead to "collaborative advantage", which emphasises the creation of "new value together" rather than the "neutral" exchange of resources between firms (Ingirige and Sexton, 2007).

Further, Handfield and Nichols (2002) suggest that relationship management is perhaps the most fragile and tenuous issue in a supply chain and is therefore the most susceptible to breakdown. They contend that a poor relationship at any link in the supply chain can have disastrous consequences for the entire supply chain. For example, an undependable source of materials can virtually cripple a construction site activity, leading to inflated lead times, higher costs and resultant problems across the supply chain.

Consequently, the first section of the research questionnaire investigates current construction industry issues that can be classified as part of the structural problems undermining the construction industry. Table II indicates the respondents' degree of concurrence relative to ten statements pertaining to various common structural problems in the construction industry in terms of responses to a scale of 1 (strongly disagree) to 5 (strongly agree), and a mean score (MS) ranging between 1.00 and 5.00. It is notable that nine of the ten MSs are above the midpoint score of 3.00, which indicates that in general, the respondents can be deemed to agree with the statements. The agreement of the respondents with the statements in Table II supports the assumption made in the research problem statement. It is instructive to note that the presence of these structural problems may portend negative consequences for the industry in terms of value created in the construction process and performance of the industry as a whole.

The MSs that fall within the range $> 3.40 \leq 4.20$ indicate that the degree of concurrence is between neutral to agree/agree – four statements. The result reveals that short-term objectives and price-oriented approach persist in the industry. This finding is

Statement	Mean score	Rank
Short-term objectives and price-oriented approach persists in the industry	3.81	1
Significant numbers of irregular clients of the industry	3.62	2
The construction supply chain is fragmented	3.46	3
Uneven level of commitment of project parties	3.42	4
Adversarial relationships are endemic in the construction process	3.38	5
Disproportionate assessment and allocation of construction project risks	3.28	6
Strict and inflexible adherence to contents of construction contract data	3.24	7
Presence of inefficient and ineffective problem solving mechanism	3.16	8
Presence of contractual and competency distrust in the supply chain	3.08	9
Poor use of modularisation to reduce construction time	2.92	10

Table II.
Issues pertaining to structural problems in construction

reportedly detrimental to core capability development, and the achievement of sustainable competitive advantage in the construction industry (Ingirige and Sexton, 2006). In addition, the industry is equally besieged with high numbers of irregular clients, uneven levels of commitment of project parties and fragmentation's role, as a problem was equally affirmed. This result corroborates the findings of the CIDB in 2004 (CIDB, 2004).

MSs that fall within the range $> 2.60 \leq 3.40$ indicate that the degree of consensus is between disagree to neutral/neutral – six statements. The respondents downplayed the presence of contractual and competency distrust in the supply chain. This suggests that the foundation for collaborative working may exist for all construction activities (Rivera *et al.*, 2007). At the same time, the respondents affirmed that strict and inflexible adherence to contents of construction contract data is rampant. A situation, Peat and McCrea (2009) contend is not conducive for collaborative relationships in construction.

Furthermore, inefficient and ineffective problem-solving mechanisms as well as adversarial relationships contribute to poor performance in the industry. These results support the argument that contractor's commitment can be improved, if open and honest communication between project stakeholders and efficient problem resolution mechanism exist in the construction supply chain (Ng *et al.*, 2002). It should be noted that though "tense" relationships within project teams can be improved or restored by focusing on perceptual differences related to issues of conflict, if conflict is not properly managed, it can easily lead to relationship breakdown that portends negative consequences for the project (Vaaland, 2004).

The poor use of modularisation to reduce construction time was equally recorded in the survey. Harding (2010) suggests that advances and variability in materials, systems and designs that are significantly different and customised for each new project may be responsible for poor use of modularisation in the industry.

Therefore, the improvement of relationships between project partners should include all members of the project team because collaboration enables project participants to build capacity to complete a set of tasks that one sole organisation would find difficult to achieve (Shelbourn *et al.*, 2007). Notably, collaborative workings are mostly

customer-driven because contractors often enter into collaborative relationships with the hope of financial gains from reductions in development cost and risks (Akintoye and Main, 2007).

In addition, Bresnen and Marshall (2000) contend that factors responsible for successful construction collaboration at the implementation phase of the project life cycle include importance of the relationship and even distribution of benefits, high level of top management commitment and trust, shared risk and response to client needs, good communication, sufficient resources, improved efficiency and understanding the role of each member of the project team. To be succinct, collaborative working across the supply chains can significantly mitigate risks and reduce uncertainties through timely exchange of appropriate information (Christopher and Peck, 2004).

3.3 Contractors' perceptions of collaboration in South Africa

It is notable that 20 (76.9 per cent) of the survey respondents affirmed that they have being involved in collaborative working arrangements in the South African construction industry within the last ten years. Therefore, the majority of GCs surveyed can be deemed to be aware of what it takes to engage in collaborative working arrangements.

Table III indicates the respondents' degree of concurrence relative to ten statements pertaining to collaborative working in South African construction. It is notable that all ten MSs are above the midpoint score of 3.00, which indicates that, in general, the respondents can be deemed to agree with all the statements.

The MSs that fall within the range $> 4.20 \leq 5.00$ indicate that the degree of concurrence is between agree to strongly agree/strongly agree – two statements. The consensus indicates that knowledge sharing and transfer is possible in a collaborative working environment, and closer relationships can also break down barriers. It follows, therefore, that closer relationships between GCs and their subcontractors as well as the effective management of relationships, which translate to positive construction process outcome, are achievable when project parties regard the subcontractor as being part of the supply chain, share a full picture of the project, share the values that are requested by

Statement	Mean score	Rank
Knowledge sharing and transfer is possible in a collaborative working environment	4.38	1
Closer relationships can break down barriers such as culture	4.27	2
Collaboration can simplify the construction process	4.19	3
Collaborative working can lead to a better quality service	4.15	4
Collaborative procurement methods can promote innovation and improvements	4.12	5
Common project goals and objectives can be negotiated in an agreeable manner	4.04	6
Long-term and stable relationships can persuade subcontractors to focus on value	3.92	7
Consistent workload is beneficiary to long-term relationships	3.88	8
Avoidable communication problems can be mitigated through collaboration	3.81	9
Lack of partners with appropriate collaborative skills	3.73	10

Table III. Contractors' perceptions relative to collaborative working

the supply chain and invite input where the subcontractor can add value (Ng *et al.*, 2002; Peat and McCrea, 2009).

The MSs that fall within the range $> 3.40 \leq 4.20$ indicate that the degree of concurrence is between neutral to agree/agree – eight statements. The consensus, which is corroborated by the findings of Shelbourn *et al.* (2007), indicates that common project goals and objectives can be negotiated in an agreeable manner within a collaborative environment. The potential of collaborative procurement methods in advancing innovation and improvement was also affirmed. However, in spite of the advantages of collaboration, the consensus indicates that there exists shortage of partners with appropriate collaborative skills in the industry.

In addition, the respondents are of the opinion that collaboration can simplify the construction process and lead to better quality service. This result supports the argument that collaboration eliminates fragmentation, duplication and distrust in construction (Shelbourn *et al.*, 2007). The respondents also agreed that consistent workload is beneficial to long-term relationships that encourage subcontractors to focus on value instead of profits. This clearly demonstrates the need to improve collaborative skills in the industry because collaboration can have a considerable positive impact on project performance, not only with regard to time, cost and quality objectives but also with regards to more general outcomes such as greater innovation and improved client satisfaction, working relationships, information exchange, conflicts and risks mitigation and productivity (Akintoye and Main, 2007). In particular, it is pertinent to embrace collaborative working concepts as collaborative effort and long-term commitment that, in turn, engenders trust and overall satisfaction within the supply chain creates value in the construction process (Davis, 2008).

In brief, it can be argued that key findings relative to the study such as short-term objectives and price-oriented approach, poor use of modularisation, strict and inflexible adherence to contents of construction contract data, unfair allocation of construction project risks and fragmentation may be addressed in a collaborative working environment that foster knowledge sharing and transfer, equitable sharing of risks and stable relationships between project partners that is manifested through the value created in the construction process. Accordingly, to mitigate these problems, it is recommended that contractors should endeavour to:

- ensure early involvement of key project team members who have expert knowledge so that an appropriate level of client satisfaction and value can be defined;
- establish stable subcontractor and supplier relationships by selecting teams based on value rather than lowest price;
- manage project parameters of cost, schedule, quality and H&S in unison;
- work together as a team to agree mutual goals and devise dispute resolution mechanisms;
- develop and monitor continuous improvement programmes;
- develop and implement sound risk management processes;
- deal with risks and rewards equitably by using modern commercial arrangements such as collaborative contract forms, target cost and open book accounting;

- use non-adversarial forms of contract and ensure that contractual relationships are appropriate for expected project objectives;
- mobilise and develop people to ensure employee satisfaction through integrated teams; and
- embrace the Latham/Egan collaborative working principles.

Though these recommendations are well-documented in the construction management literature such as Cain (2003), Bennett and Peace (2006) and Akintoye and Main (2007), the successful completion of the Heathrow Terminal 5 (T5) project in the UK highlighted the merits of collaborative working and proactive management of the construction supply chain. According to Wolstenholme *et al.* (2008), the success of the five-year construction phase of Terminal 5 at London's Heathrow airport was dependent upon putting into effect the principles of a unique form of contract, called the Terminal 5 agreement that was fundamentally built around three success themes, which include:

(1) do what you are doing well and do it better;

(2) understand "how" you will deliver as well as "what" you need to do – this means addressing organisational development as well as technical development; and

(3) continually work on the relationships including those that are inward-facing/inside the project and those that are outward-facing/outside the project.

These themes were operationalised through integrated project teams, all risk on client, shared liabilities and consistent contract forms, good industrial relations, fair employment policies, commitment to people and a culture that actively promoted opportunities. In fact, Wolstenholme *et al.* (2008) contend that in the T5 context, project culture meant creating a culture in which people were encouraged to:

- seek out, capture and exploit the best practices of others;
- remove the barriers and inhibitors to doing things differently;
- stimulate and support good ideas; and
- leverage the commercial incentives to perform exceptionally.

They say all of this needed to be underpinned by organisational development, as understanding the need for organisational changes could lead to changes in the way that teams and organisations behave. In turn, this meant empowering leaders, creating integrated teams who would work to common agendas based on co-operative relationships and incentivising people to solve problems together and act on learning, rather than allocating blame or exploiting the failure or difficulties of others for commercial advantage.

While the T5 was a large construction project valued at GBP4.3 billion, its success should not be attributed to its size only, but rather the successful completion of sub-projects that all together constitute the final project cost merit significant applause. These clearly support the argument that project size is not necessarily a determinant of the success of continuous improvement initiatives in a production environment.

4. Conclusions

Generally, surveyed GCs can be deemed to be aware of collaborative working in construction. The research indicates that collaboration-related issues in the South African construction industry are similar to those in the UK, and the identified structural problems in the study support the argument that there is a major scope for performance improvement in South African construction.

Based on the research findings, construction performance improvement through collaborative working is still at best "work in progress" in South Africa. The findings seem to suggest that fragmentation/discontinuities in the construction supply chain need to be addressed to improve performance in the South African construction industry, and use of modularisation, risk allocation processes and price-oriented approach must be improved holistically. Therefore, it is suggested that contractors should adopt collaborative procurement methods to improve performance and promote innovation in construction. The procurement method, which is often decided by clients, should be able to facilitate the negotiation of common project goals and objectives in an agreeable manner among project partners. In addition, it is imperative to note that as the integrator of numerous supply chains, contractors need to get a regular profitable workload while managing a supply chain of subcontractors and suppliers who are strategising for their own survival in an environment where adversarial relationships and opportunism are the norm, as low barriers to entry seem to maintain the fragmentation and low levels of profitability in the industry (King and Pitt, 2009).

Though the research focused on contractors and their subcontractors, a further investigation with higher response rates that will address the complete construction supply chain in the form of clients, consultants, contractors, subcontractors and suppliers/fabricators/manufacturers with respect to value creation through collaborative working in South African construction is suggested.

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