

QUT Digital Repository:
<http://eprints.qut.edu.au/>



Auti, Atul and Skitmore, Martin (2008) *Construction project management in India*.
International Journal of Construction Management, 8(2). pp. 65-77.

© Copyright 2008 The Chinese Research Institute of Construction
Management

Construction project management in India

Atul Auti and Martin Skitmore

School of Urban Development
Queensland University of Technology
Gardens Point
Brisbane Q4001
Australia

Corresponding Author:

Professor Martin Skitmore

School of Urban Development
Queensland University of Technology
Gardens Point
Brisbane Q4001
Australia

rm.skitmore@qut.edu.au

25 March 2008
(Revised)

CONSTRUCTION PROJECT MANAGEMENT IN INDIA

ABSTRACT

The Indian construction industry is known to be inefficient and highly resistant to change. Even with a changing market and increasing competition, there are no obvious signs of commensurate changes in methods and approach. Project management, on the other hand, seems to offer what is needed in terms of tools and techniques to raise industry standards. Little is known of the extent to which project management as a discipline exists in India. The aim of this paper, therefore, is to investigate the current level of application of project management and the obstacles that have prevented its introduction in the Indian construction industry.

A small questionnaire survey is reported that was conducted in early 2007. Following a pilot study, the main survey instrument was emailed to more than 150 participants and organisations. This produced a sample of 51 respondents from four different construction industry disciplines i.e. architect (21), engineer (19), project personnel (9) and building surveyor (2).

The responses and suggestions provided by the returns are studied and reviewed. These indicate that the Indian construction industry is growing and most of its consultants know of the existence project management. Barriers for the application of project management knowledge do exist, with 45% of the respondents indicating a high level of obstacles. A particular issue is the lack of encouragement from the construction organisations. A major difference was also observed between the public and private sectors, with many of the respondents claiming that project management is possible on a large scale in the private sector but not in the public sector. The reasons for this difference are government policies such as excessive bureaucracy, poor execution of projects, compromises on quality and standards, personal interests, low transparency and corruption. In addition, a large majority of respondents agreed that the construction industry lacks a structure or pattern; that tools such as project management can provide the structure needed; and with the help of this structure the industry should be able to overcome the problems involved in increased modernisation and transparency and be better prepared for future challenges.

Keywords

Construction industry, India, obstacles, Project management, practice, public and private sectors, structure,

INTRODUCTION

With new research and developments, the field of project management continues to grow in terms of knowledge and practice (Clarke 1999:139). Project management has been accepted by many industries and, with on-going globalisation, international projects and markets, is practiced almost the world over. In India, however, the construction industry has been and still is very labour intensive (Koehn and Ganapathiraju 1996:PRD31). Over a long period of time the Indian

construction industry has experienced very few changes in terms of new technologies and advanced methods (Koehn and Jagushte 2005:IN31). This is understandable to some extent, as current practice utilises the labour force available and aims to provide maximum employment opportunities. With ongoing developments and the future interest of many international organisations, however, consideration needs to be given to adopting advanced methods of planning and execution of its various projects. This will set new standards, provide firm structure to the industry and make it more efficient and productive.

Despite its world-wide growth, formal project management is rarely evident in the Indian construction industry and there is little planning for capability and professionalize (Sreepuram and Rao 2006). In particular, with the current growth of construction work in India, management attention to projects has become a casualty and organisations are ill structured for the modern project management task. (Sreepuram and Rao 2006). Although there has been a little written about the Indian construction industry in terms of the different factors influencing the industry (e.g., Majie and Punia 2004), there is nothing at all concerning the issues affecting the industry as a whole, the current status of the industry, the challenges for the industry and the measures that can be taken to change its traditional and labour intensive nature.

The paper explores areas such as: the current economic status of the Indian construction industry; the knowledge the industry professionals have of project management and its methods of dealing with various projects; the problems faced by industry professionals; and awareness of the structure or pattern that project management can provide to the industry. Further examined are the changes taking place to improve industry standards; encouragement and support for methods such as project management by the industry and various organisations; efforts made to improve efficiency and productivity; other factors such as competition, transparency and modernisation, which demand changes in the industry; the difference in implementation of project management in the public and private sectors; and the future challenges for the industry.

BACKGROUND

After China, India is the second most populous country in the world, with a total population of 1,027 billion at the 2001 census (Indian Child 2007). It is also one of the densest, with 324 people per square hectare (Indian Child 2007). Its economy encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries, and a multitude of support services (Chiang *et al* 2005). The construction industry is the second largest in India and acts as a vanguard and sets pace for growth of all other sectors (Ranavive and Gaikward 2006). It employs over 32 million people, or 16% of the working population (Chiang *et al* 2005), increasing at over 1 million per year (Majie and Punia 2004), contributes 5.7% of GDP (Chiang *et al* 2005) and constitutes 40% of investment in India (Ranavive and Gaikward 2006). Barely 25% of its workers had even some type of rudimentary training received from their guilds or their parents (Chiang *et al* 2005: 15). Even those workers needed some retraining to have a well-rounded knowledge of the construction trade that they follow. Moreover the level of literacy was very low (Chiang *et al* 2005: 15). As a result, the construction processes tend to be simple and easy to understand and follow a traditional approach that has been prevalent for many years.

In the five years prior to 2004, Indian construction was between INR 20,000 and 30,000 million¹ but with a recent sudden growth to around INR 200,000 (Majie and Punia 2004). With the sudden growth in construction activity in the country, most of the major organisations have substantial projects to execute. With globalisation, increasing competition and awareness of clients, there is a requirement to deliver projects successfully and build up the organisations (Ahuja 2007).

There has been some research regarding the state of the Indian construction industry but very little is related to project management as a whole. These include Koehn and Ganapathiraju (1996), who discuss the status of the industry, particularly in terms of the construction processes in developing countries such as India being labour-intensive operations, with the latest and advanced construction technologies only available to very few contractors. In terms of safety most accidents in the Indian construction industry occur due to poor education and training, and negligence and ignorance on the part of the worker and management (Koehn *et al.* 2000),.

The findings of the survey conducted by Iyer and Jha (2005), on the other hand, give some indication of the factors affecting the cost performance of Indian construction projects, including the extent of: adverse climatic and economic conditions; unfavourable project specific attributes; top management support; monitoring, feedback, coordination, conflict and knowledge of the project participants; and reluctance to make timely decisions. Of these, coordination amongst project participants was found to be the most significant of all factors, having a maximum positive influence on cost performance.

Koehn and Jagushte (2005) have also discussed the different challenges faced by the industry, such as growth in response to increasing demands for goods and services; technological upgrading for speed, quality and cost reduction; and the use of modern equipment. They found that modern management practices for greater profitability; a more modern, clean image; increased technical skills and financial strengths are also required. Furthermore, organisational competence is needed to meet domestic and international standards and to be competitive in the international market.

Sreepuram and Rao (2006) have also commented that a further factor is that India is currently undergoing massive financial development with many investments being made in infrastructure and further the overall development of the country. With competition growing both domestically and internationally and additions to existing demands, these issues need to be addressed to withstand increasing competition and to increase profits and efficiency. The root cause of most of these issues seems to be a lack of structure in the industry. Certainly, overcoming structural problems is expected to give it a new edge provide a cleaner image; encourage greater competency; and an increased ability to compete and satisfy consumer demands (Sreepuram and Rao 2006).

Against this background, the research described in this paper aimed to identify the current level of project management activity; differences between the public and private sectors; potential obstacles; and the extent to which project management is accepted in the industry. This was carried out through a questionnaire survey to specifically establish:

1. The current extent of knowledge of project management and its practice in the industry

¹ 1INR=0.0250 USD on 25 March 2008 (<http://www.x-rates.com/d/INR/table.html>)

2. The current economic status of the industry and success parameters and/or criteria that deem a project successful
3. The status of basic success criteria in terms of cost, quality and time, and particularly the extent to which quality is a factor in addition to pure profit
4. The changes or improvements in regards to cost, time and quality
5. Opinions of project management, its impacts, benefits and possible adverse effects
6. The current areas of concern in the industry over the execution of projects
7. The industry approach to different phases of projects and the similarity and differences between phases
8. The current strategies, structures and patterns implemented in the industry to ensure projects are executed as planned
9. Any improvements, developments or recent changes in the approach towards increasing productivity and efficiency in the industry
10. The reasons to change the industry's current approach, to increase productivity and efficiency
11. The possible benefits and consequences of implementing project management
12. The current constraints obstructing the practical implementation of project management
13. The practical aspects and phases of the project that have maximum influence
14. The differences in the application of project management in the public and private sectors
15. The pressures on the industry to respond to changing trends and fluctuating markets
16. The relevant foreign investments and interests in the industry and identify any differences in their approach
17. The implications for practice of increased foreign investments and competition.

These questions are aimed at establishing the current nature of PM in India, its strengths and weaknesses and how it can be more successful in future and cover many of the issues in located in the literature. As a result, it was anticipated that these key aspects would provide knowledge of the basic issues concerning the current and possible future of project managers in the Indian construction industry and act as a basis for future research of project management on the sub-continent. It was also expected that the results would add to some of the more specific aspects of previous the empirical studies of Iyer and Jha (2005).

THE SURVEY

Method

The questionnaire was piloted with two associates from the Indian construction industry – a Senior Architect and a Planning and Project Control Manager - to check the relevance of the questions asked and of any difficulty in understanding and answering them. This led to some minor changes in the questionnaire concerning some ambiguity in questions and rewording of questions. The final version was sent to a convenience sample of 150 organisations and potential participants for response via email. The potential respondents consisted of various project managers, architects, engineers, surveyors and consultants currently active in the industry in India and considered capable to providing the required feedback.

A total of 51 (34%) responses were obtained – a reasonable rate for this type of questionnaire (Cavana *et al.* 2000:245). The reasons for non-response are assumed to be the busy schedule and lack of time for potential participants to complete the questionnaire rather than any possible source of bias.

The respondents comprise 21 architects, 9 project managers, 2 surveyors and 19 engineers. All are currently active in the industry, with a minimum of 5 years work experience, and are well qualified professionals, with a minimum of a bachelors' degree qualification. For the analysis, the responses were divided into three conveniently sized groups of: architects, engineers and other (project managers/surveyors) respondents. With one exception, respondents were asked to score to the various questions on a scale of 1 ("low") to 5 ("high").

Results

With the exception of one architect and the two surveyors, all respondents have heard of project management.

The respondents were asked to rate the economic state of the Indian construction industry on a scale of 1 ("slump") to 5 ("booming"). Fig 1 shows the average responses of the three professional groups, indicating a near consensus that the industry is very buoyant. Also shown in Fig 1 is the averaged annual turnover of the respondents' organisations, measured on a scale of 1 (up to USD 11k) to 5 (over USD 11,000k), where 1 USD = 38 Rs, and indicating the respondents' organisations to be typically quite large.

Respondents were also asked to rate the importance of the various phases for the successful completion of projects. As it can be seen from Fig 2 (overall average for concept phase 4.05, develop phase 4.2, construction phase 3.8 and termination phase 3.8), all are quite important and with little differences between the various professions involved.

Fig 3 provides the averaged responses for different project success criteria. These include profit, efficiency, cost, time, quality, safety, satisfaction of users and clients, satisfaction of team members, and structure or pattern while executing projects. As it can be seen (overall averages for engineers 3.9, architects 3.8 and others 3.8 against all the success criteria), there is uniformity and understanding of the importance of the different success criteria.

Fig 4 provides the averaged responses concerning the need for a pattern or structure in the industry and the extent to which it is thought that project management can provide that structure. Here the pattern referred to is an organised and planned model or structure to execute the various and interlinked phases of a project. As Fig 4 shows, all the professions agree that the industry does not have the structure required for executing projects but, with some variation in opinion, this can be provided by project management.

Fig 5 gives the results concerning the obstacles that stand in the way of putting project management principles into practice and the encouragement or support that is needed to be provided by the organisations. Respondents were also asked about the extent to which the implementation of PM is/will be appreciated by clients, end-users and stakeholders level of

appreciation by clients, stakeholders and users of project management in practice and general acceptance of project management by industry overall. The results indicate a high level of appreciation by clients, stakeholders and users (overall average value of 3.9) but some diversity in terms of acceptance of project management (3.75) by the Indian construction industry overall. In addition, respondents were asked to rate the amount of effort currently being expended in the industry to improve its current image and preparedness for future challenges. The results are promising, with an overall average value of 3.8.

In terms of importance given to various project aspects while executing projects, including time, cost, risk, quality, communication, human resources, project procurement and project scope, Fig 6 (overall averages for engineers 4.1, architects 3.85 and others 3.9 against all the project aspects) indicate a uniformity and understanding of their importance.

Finally, Fig 7 gives the results concerning the many challenges facing the industry including growing competition, increasing productivity and efficiency, providing structure and pattern to the industry, providing transparency and a better image to the industry, modernisation and satisfying growing demands. On a scale of 1 to 7, these suggest (with overall average values of 4.54 for engineers, 4.69 for architects and 5.21 for others) that there is a realisation in the industry about these issues and hence a motivation to change the way the various processes within the industry are viewed.

Open-ended questions

Verbatim comments in answer to the question “If there are any differences in terms of application of project management in public and private sector, can you list some of them?” comprise:

- Project management in India is becoming widely accepted, we have project managers in private as well as public sectors. The application differs in public sector versus private sectors. The difference is in terms of funds, infrastructure, requirements, implementation and scope of work. All these aspects are better in private sectors than public sectors. The factors in the private sector also depend on the organisation involved.
- The public sector still follows the conventional type of project execution and is yet to adapt to the project management approach
- In the public sector, a lot of the decisions and data required for sound project management system never reach the project management team on time due to bureaucratic delays. It is much easier to apply project management in private sector.
- In the public sector, there are differences in work methods and organisation structure (it is highly bureaucratic) and hence the work atmosphere is not good.
- In the current scenario in India, it is out of the question for the public sector to implement project management as most of the decisions regarding these projects are ruled by financial matters.
- Negligence on all parts, including time factor, is so high that it makes practical application of project management difficult to these projects.
- One of the main differences in project management application is that most of the public sector organisations prefer to have separate entities (foreign or local consultants) for their project management so that the problems faced during the external audits or vigilance can

be reduced. The private sector companies, on the other hand, have internal departments which are specialised in the work, which can be further benefited/advised by external auditors.

- The scope of projects is not well defined and lot of variations occur in the later stages, Insufficient planning for funds and resources results in delays in public sector projects. Lack of human resources trained in project management skills in public sector organisations. Use of project management software is seldom seen in public sector. It is observed that less importance is given to quality, safety and customer satisfaction observed in public sector.
- Quality is good in private sector projects and poor for public sector projects. Time is shorter in private sector projects and longer for public sector projects. Cost is less in private sector projects and more for public sector projects.
- Work progress delivered in the public sector is less in comparison to that in the private sector. Management activities differ as in the private sector matters are confined inside the organisation while they are treated globally in the public sector.

Similarly, additional comments provided in answer to the question “Any other relevant information not covered in the questionnaire?” include:

- Poor quality of human resources. Existence of bureaucracy, finance, politics, variations in government strategies, corruption, political influences, traditional government policies
- Better awareness and adaptation to project management principles and applications in projects in India is needed to take care of the current boom in construction industry.
- There is a very high need to make changes in current practice and make it more efficient by the use of tools and methods such as project management.
- The present rise in the construction industry in India though has been tremendous in terms of infrastructure and the real estate areas, but the real boom is yet to start, may be in next few years when one can expect growing market involvement among foreign organisations and investors and also the participation of the World Bank will play big role. Keeping the above in mind, the organisations will now strictly monitor their efficiency and effectiveness in handling the projects keeping in consideration the cost and time element without compromising on the quality of work and maintaining great relations with client by keeping up with the results-orientated desire of the customers.
- A lot of emphasis has to be given to project planning right from bidding stage. Project control (cost control) is most essential. A proper system to monitor your project will help you track the profitability of the project at every stage. Communication is vital in a project, but much neglected.

DISCUSSION

Overall, there appears to be a good knowledge base for project management, its aspects and what project management can provide to the Indian construction industry. The establishment of institutes such as NICMAR (National Institute of Construction Management and Research) and PMA (Project Management Associates) - India, where courses and seminars are offered in project management is a good sign for the future of the industry. Furthermore, efforts are needed to make sure of effective implementation to avoid the situation existing where knowledge is present but

not utilised. It is possible that this has occurred in the past, hence very few changes have taken place over a long period of time.

The results of the survey indicate that the Indian construction industry is booming. This is due to a growing economy and demand, interest of foreign investors in India and ongoing major developments in India with more developments to occur in the future. There is also an indication of changes in the industry in terms of quality and standards, starting from the preference of the basic quality triangle over the cost and profit aspects of the project. Results of the data analysis indicate that, regardless of ongoing developments, there is an effort in the industry to maintain basic standards such as cost-time and quality triangle. With more knowledge, encouragement from organisations and if the industry professionals work on the principle of continuous improvement, more parameters can be added to the existing list and this may eventually raise standards in the industry. There is an indication that some projects have been solely cost and profit orientated, which is not surprising considering busy schedules, the past history (traditional and labour intensive) of the Indian construction industry and the existence of profit orientated individuals and organisations.

The basic aspects of project management: time, cost, risk, quality, communication, human resources, project procurement and project scope seem to be well understood and consideration is given to these project aspects while executing various projects. From the results of the data analysis, it can be said that there is general understanding of the importance of different phases of the project (concept/feasibility, design/develop, construction and termination phase) and attention is paid to these phases while executing various projects. The two phases of concept and design are receiving more attention when compared to the construction and termination phases. A possible reason for this may be that after finalising the concept and required planning for the project, the construction and termination phases may be seen as routine or secondary phases. Other reasons which may be given are busy schedules, too many ongoing projects at the same time and lack of focus or persistence for seeing them through.

The different success criteria provided in the questionnaire were selected on the basis of the literature review and general understanding of the subject of project management. These success criteria include profit, efficiency, cost, time, quality, safety, satisfaction of users and clients, satisfaction of team members, structure or pattern while executing projects. As can be seen from the data analysis results, there is a basic understanding of these success criteria but more needs to be done. This will be possible when the Indian construction industry is moulded into a better defined structure or pattern. Likewise, customer satisfaction was one of the parameters discussed in the criteria for success and seems to receive some attention in the Indian construction industry. It is understood that the clients, end-users and stakeholders will appreciate the implementation of tools such as project management. The main reason that this has not yet occurred may be the lack of structure and transparency in the industry, which may possibly be achieved by effective implementation of project management.

The findings of the data analysis showed a need for a pattern or structure in the industry (where pattern is referred as an organised and planned model or structure to execute various and interlinked phases of any project) and to the extent that the respondents think project management can provide structure to the industry are interesting. The professions do agree that the industry does not have the structure that is necessary for executing projects, and there is a

slight variation in the perception of project management being able to provide the missing structure. This variation is assumed to be because of the uncertainty about overall change in the industry and the obstacles professionals are observing while implementing project management concepts in practice. In the data analysis it is observed that there are obstacles in the Indian construction industry while implementing tools like project management, and organisations should provide more encouragement and support for implementation of such tools and techniques.

One of the more prominent concerns is the level of difference in application of project management between the public and private sectors of the Indian construction industry. Some of the common reasons mentioned by the respondents are government policies, bureaucracy, corruption and lack of flexibility in terms of methods and practice.

The major drivers for the Indian construction industry development are growing competition, increasing productivity and efficiency, providing structure and pattern to the industry, providing transparency and better image of the industry, modernisation and satisfying growing demands. From the data analysis it can be concluded that there is a realisation in the industry of these issues and a motivation to change the way things have been viewed in the past. Considering the current level of effort in the industry, in order to change the current image of the industry and make it ready for any future challenges, it can be said that there is an awareness of the drawbacks of the current methods and practice in place, and there is a realisation about future challenges and milestones for the industry. Measures are currently being developed to rectify these issues. This is an important and promising conclusion from the survey and data analysis.

CONCLUSIONS

The Indian construction industry is growing and it is possible that the effective implementation of project management may contribute to it reaching new levels of success and higher standards. There is already some knowledge and understanding of project management, its methods and benefits (transparency and increased productivity and efficiency with the modernisation of the industry) and how project management can improve standards. Due to the growing economy and demand, interest of foreign investors in India and ongoing major developments in India with more to come, the Indian construction industry is booming and there is a good balance of turnover and interaction among different professions.

The qualities that project management offers (transparency, flexibility and modernisation) should change the image of the industry and also be appreciated by everyone including clients, stakeholders and end users. There is growing awareness of the drawbacks of current methods and practices while, and at the same time, there is a realisation of future challenges and milestones for the industry. A new generation of professionals is making an effort to put project management into practice, but the implementation of project management faces obstacles due to the traditional and labour intensive nature of the industry. For successful implementation of project management, there needs to be encouragement and support from construction organisations, such as training of existing staff and new recruitments on the basis of project management knowledge.

Care should also be taken so that growing demands and the status of the industry does not affect the importance of the quality triangle and is not overly influenced by the cost and profit aspects of projects. The various phases of projects receive considerable attention but the overall process needs to be revised with the implementation of appropriate changes.

Finally, it is important to mention the huge difference in the application of project management between the public and private sectors of the Indian construction industry. This is due to government policies such as excessive bureaucracy, poor execution of projects, compromises on quality and standards, personal interests, low transparency and corruption. This suggests that changes should be made in government policy and the way public sector projects are carried out. Efforts are needed to improve productivity and efficiency in the Indian construction industry to satisfy growing market demands. At the same time, the industry needs to understand the changing market and trends. Currently there is no pressure on the industry but, with the growing economy, foreign investments and possible major development of infrastructure in the country, there is a need to change the current approach made by the industry, in response to changing trends and market, for future challenges and to successfully compete with foreign organisations.

REFERENCES

- Ahuja, V., 2007, IT enhanced communication protocols for building project management by small and medium enterprises in the Indian construction industry. Unpublished PhD thesis, Queensland University of Technology.
- Cavana, R., Delahaye, B., Sekaran, U., 2000, *Applied business research: qualitative and quantitative methods*, John Wiley and Sons publications, New York.
- Chiang, Y.H., Anson, M., Raftery, J. 2005, *The construction sector in Asian economies*. Spon Press: London and New York.
- Clarke, A., 1999, A practical use of key success factors to improve the effectiveness of project management, *International Journal of Project Management*, **17**(3):139-45.
- Indian Child, 2007, Population of India, http://www.indianchild.com/population_of_india.htm (accessed 25 March 2008)
- Iyer, K.C., Jha, K.N., 2005, Factors affecting cost performance: evidence from Indian construction projects, *International Journal of Project Management*, **23**(4):283-95.
- Koehn, E., Ganapathiraju, V.R., 1996, Productivity of construction in developing areas: India, *Transactions of AACE International*, ABI/INFORM Global pg. PRD31.
- Koehn, E., Jagushte, S.A., 2005, Construction productivity in developing global regions, *AACE International Transactions*, ABI/INFORM Global pg. IN31.
- Koehn, E., Ahmed, S.A., Jayanti, S., 2000, Variation in construction productivity: developing countries, *AACE International Transactions*, ABI/INFORM Global. pg. I4A.
- Majie, H.S., Punia, H.S., 2004, Strategy to enhance the standing of India's construction industry – review of strengths and weaknesses of existing systems and technology, *Proceedings of construction opportunities and strategies for action with focus on Asia Pacific, Middle East and Africa regions*, Sep, **2**:1-10.
- Ranavive, M.S., Gaikward, A.A., 2006, Information Technology in the Indian construction industry, In Swarup, P.R. and Kumar, B. Ed. *Proceedings of the world conference for design and construction*, INCITE/ITCSED, New Delhi, India, Nov, **4**:22-32.

Sreepuram, P., Rao, A.K., 2006, Build organization capabilities to utilize IT. In Swarup, P.R. and Kumar, B. Ed. *Proceedings of the World Conference for Design and Construction, INCITE/ITCSED 2006*, New Delhi, India, November 2006, Vol. 4.

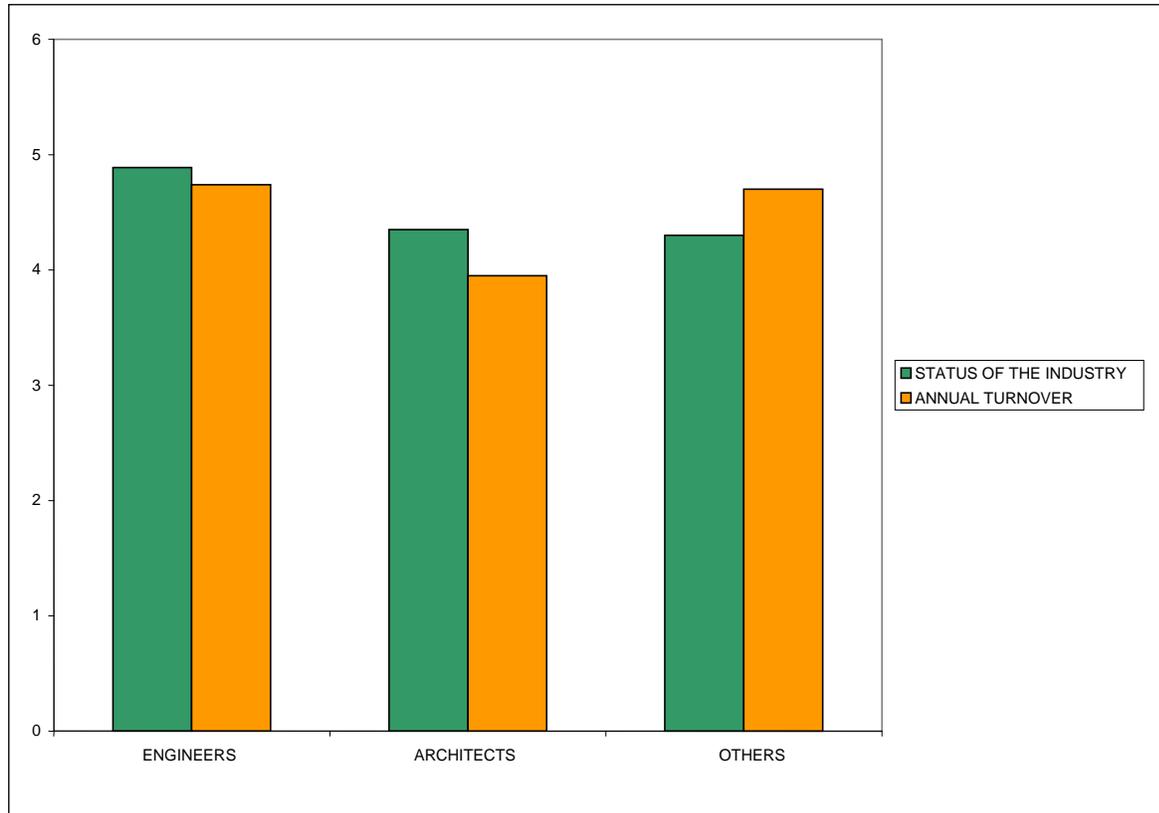


Fig 1: Status of industry and annual turnover

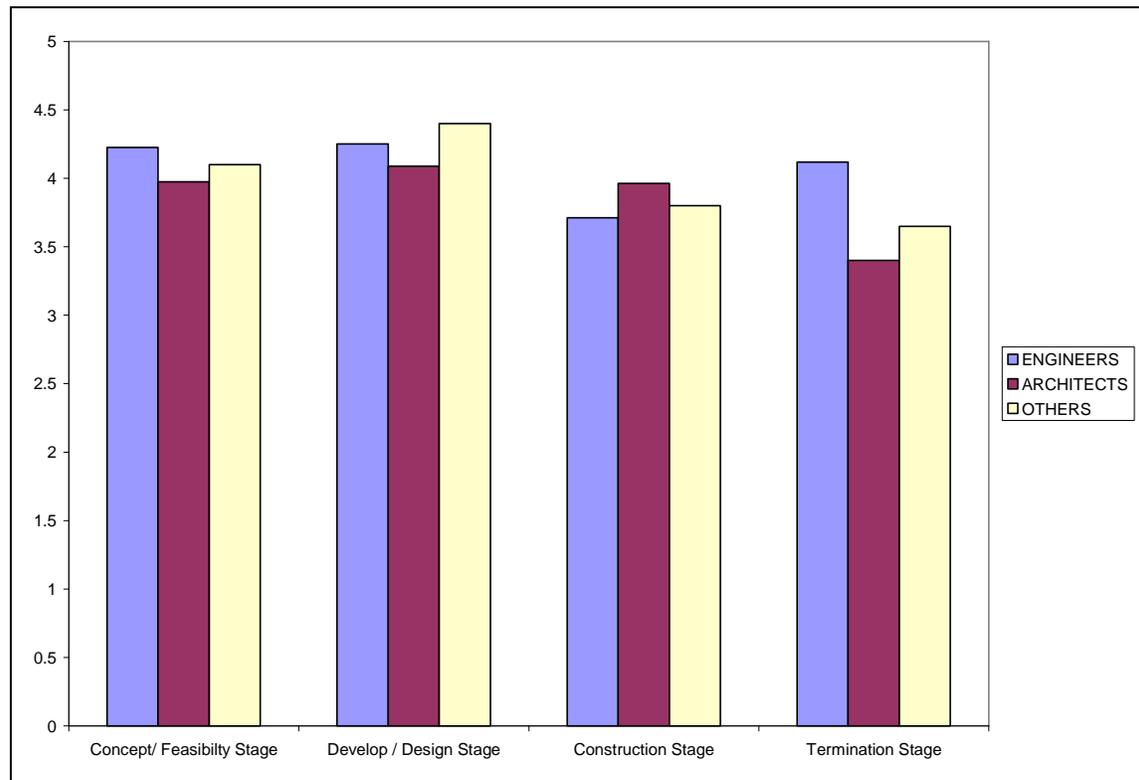


Fig 2: Different professions mean scores of the importance of various phases of a project

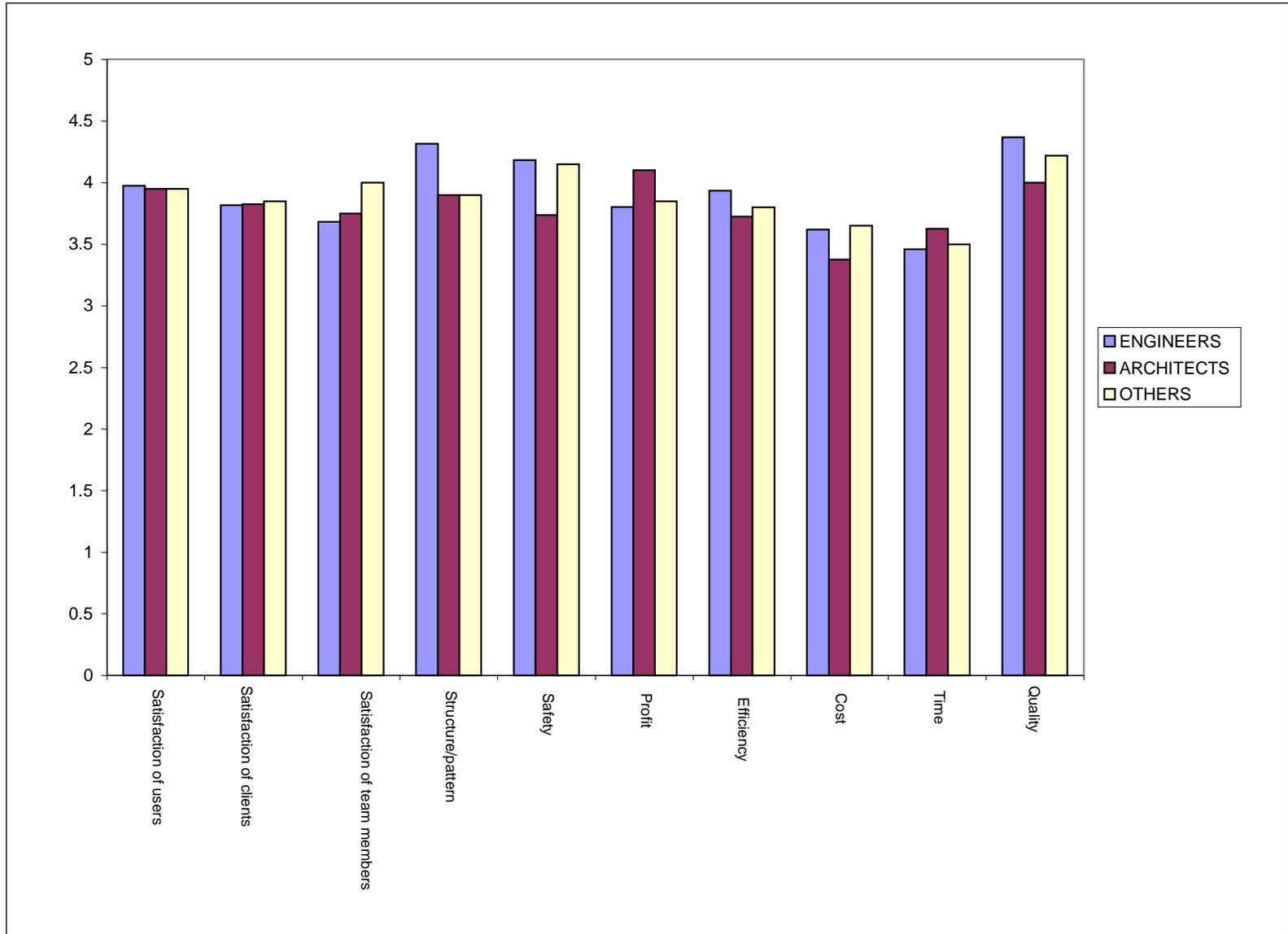


Fig 3: Success criteria and different professions

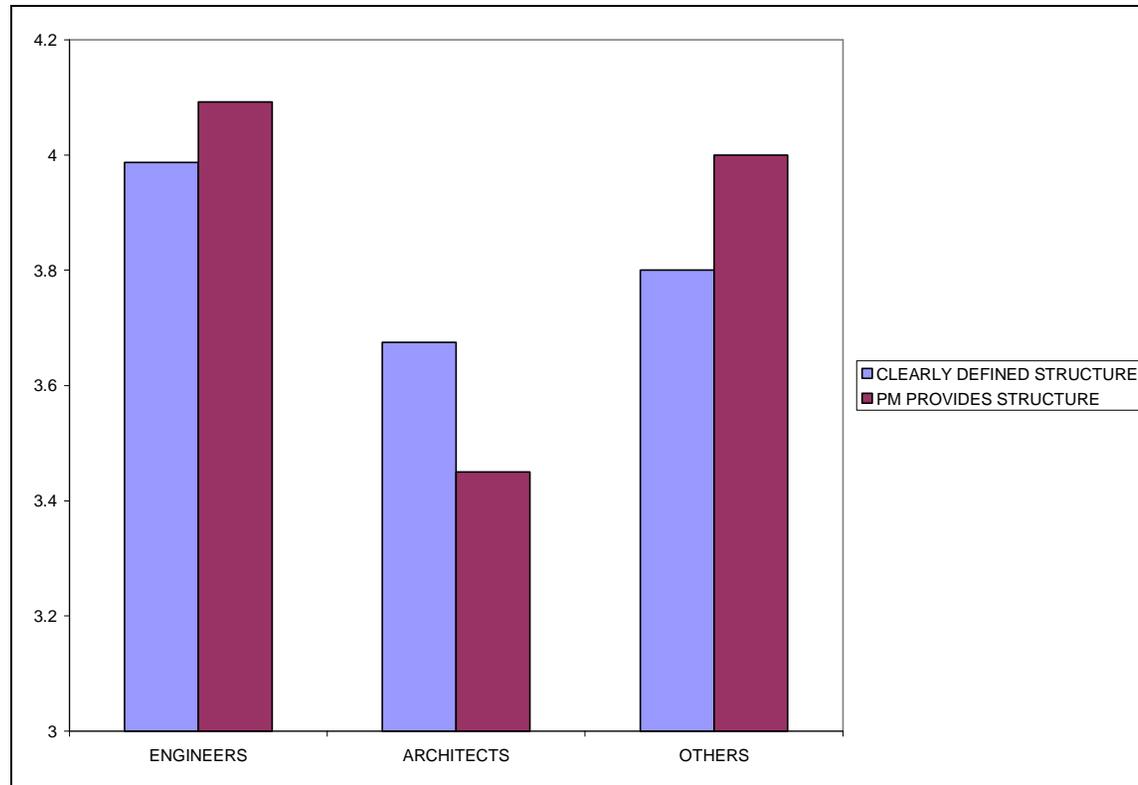


Fig 4: Need for clearly defined structure and extent to which pm can provide structure

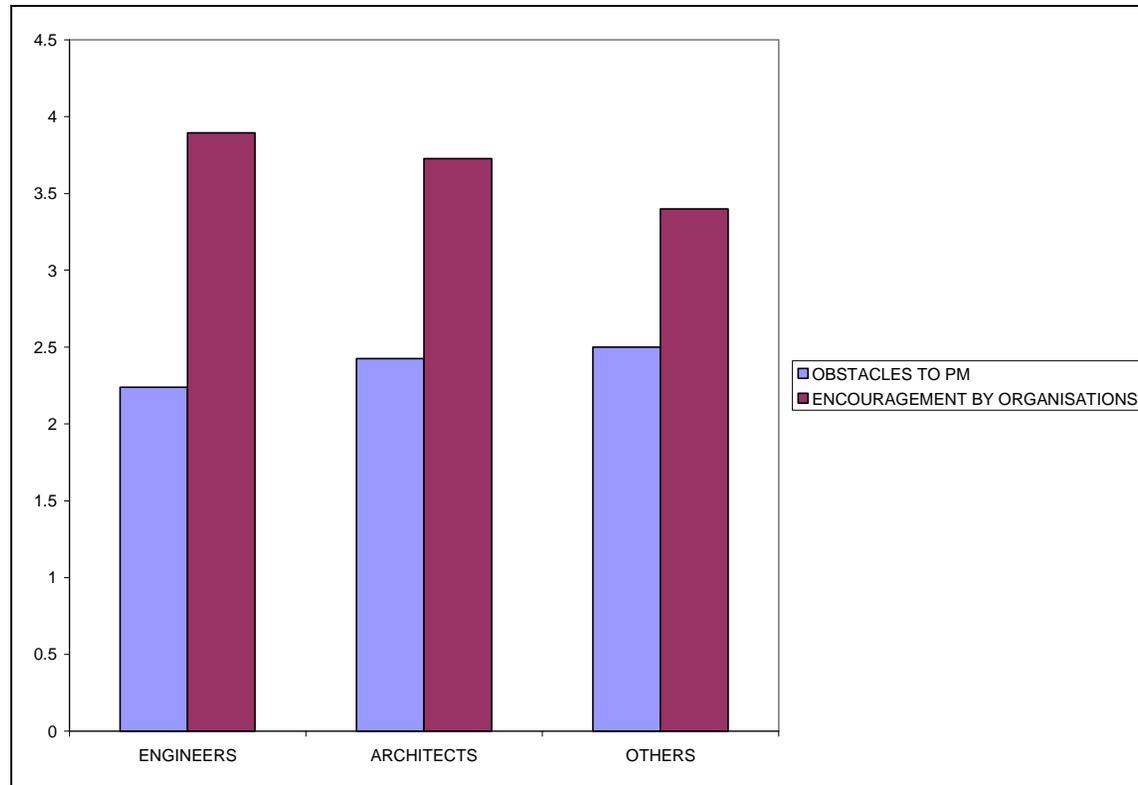


Fig 5: Obstacles to PM and encouragement required from organisations

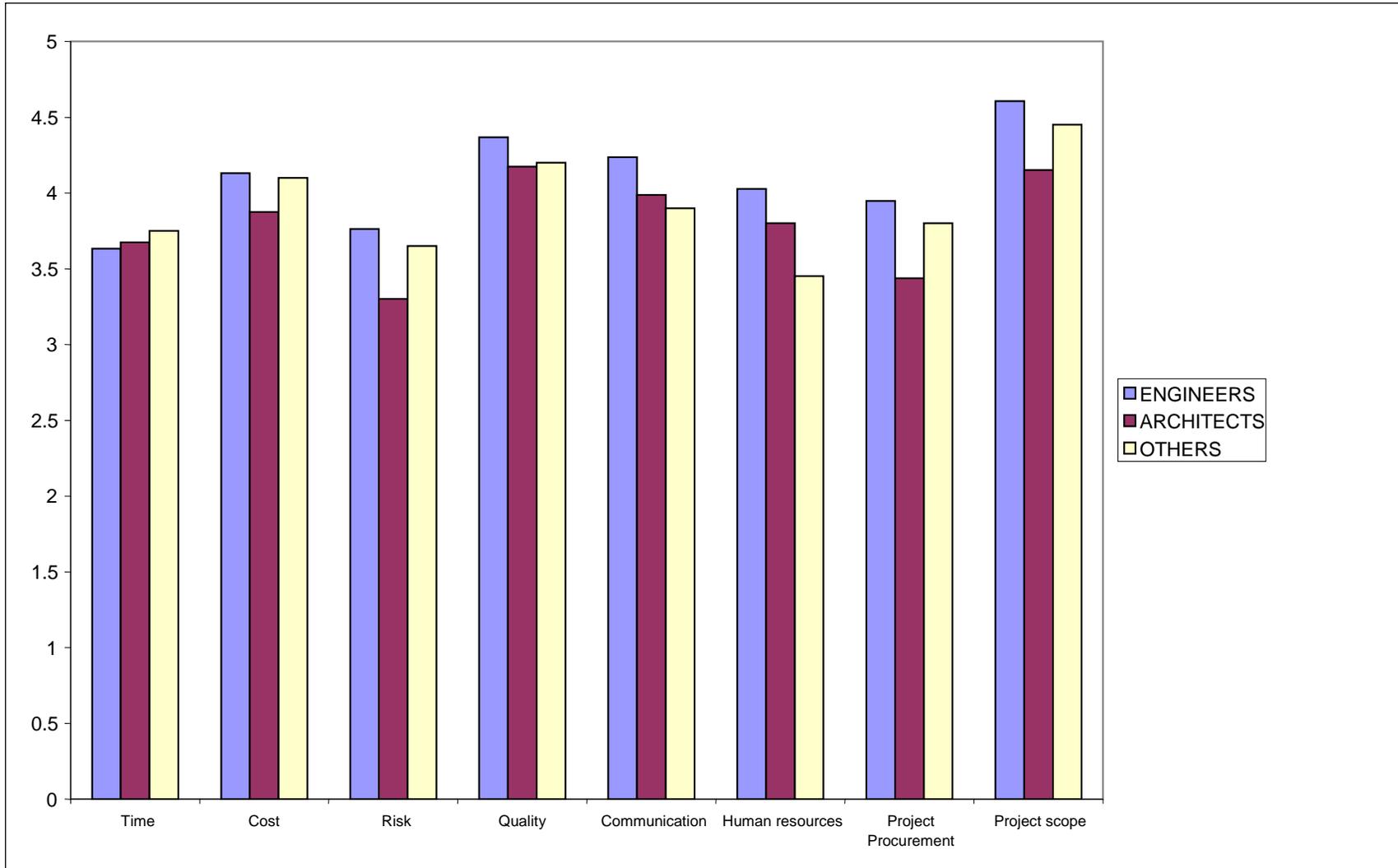


Fig 6: Various project aspects and different professions

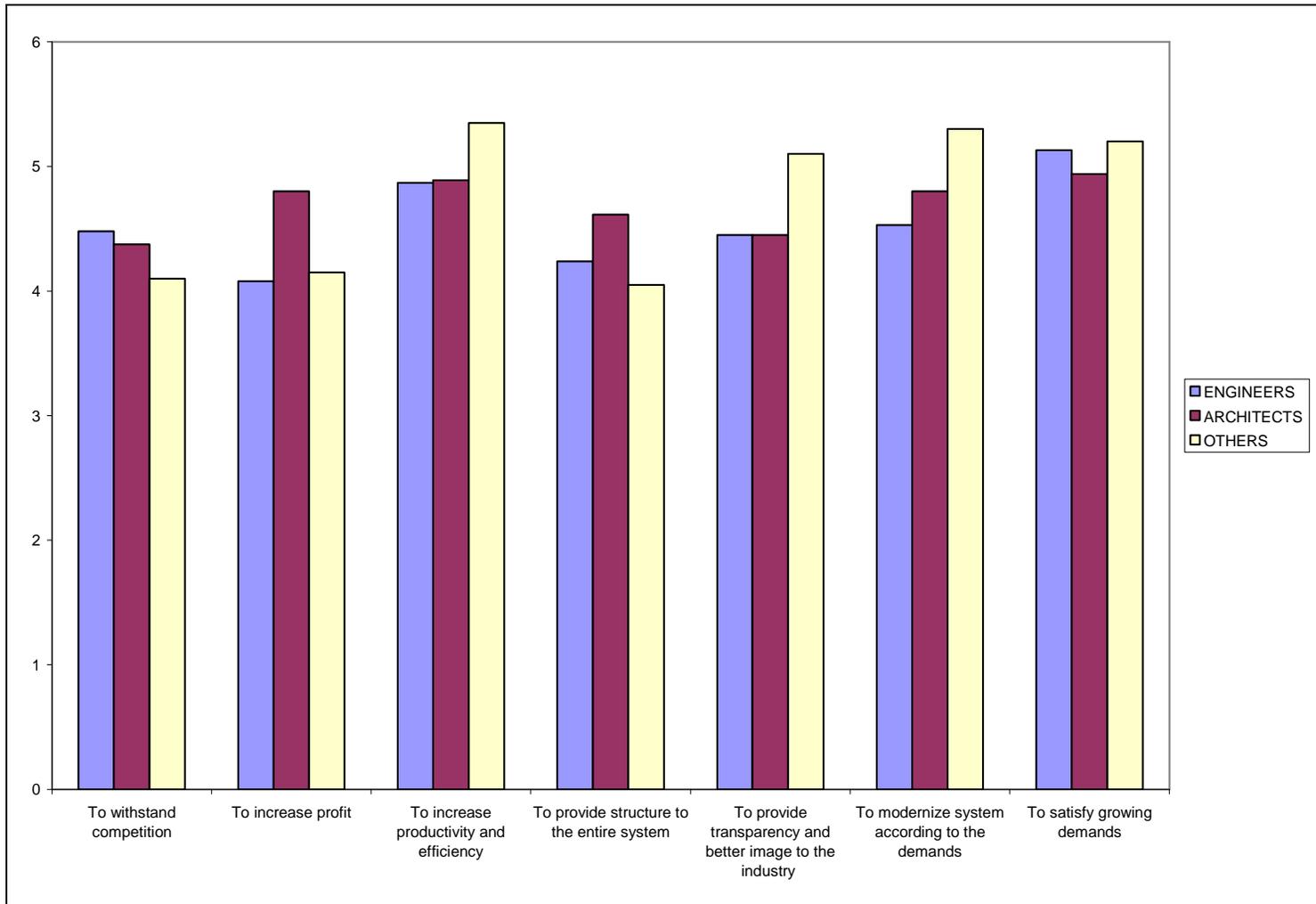


Fig 7: Reasons to change and different professions