

RENEWED AND NEW EMERGING ROLES IN CONSTRUCTION

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Abstract

There is a fundamental change in the making in construction. We come from a situation in which building companies are strongly orientated to the realisation of projects. The common basis of these projects is: the client asks for something, which the contractor, with the help of other companies, will realise. As society we constantly strive to improve products and services in construction. The market on the other hand looks for ways to realise healthy profit margins that makes entrepreneuring in construction appealing. This is causing a change of focus towards value adding on a life cycle basis. This new paradigm will bring an entirely new way of doing business. Building long term relationships with clients will become the norm, which will mean that the entire life cycle will need attention. To be able to respond to these complex assignments contractors, suppliers and subcontractors will need to form integrated value chains. These integrated chains will make it possible to innovate and set ambitious goals in order to realise high quality and sustainable buildings with additional services.

The shift towards a new paradigm in construction will put the creation of value, in the eyes of the client, central in the formulation of new business models. Central question is: how to create value? In principle this question evokes an ongoing circle which starts and ends with knowledge of every aspect relevant for value creation. Building and services have to be developed that fit the required business proposition.

New business models mean a new way of organising work in the construction industry. This raises the question how to formulate new roles and goals. The new business models will automatically affect the roles common parties in the construction sector can have and will have. New parties can be expected to emerge in construction as well.

There is an opportunity for existing parties to extend their role with tasks that used to be performed by other existing parties (forward and back ward integration). New business models will also lead to new roles. On the other hand parties may wish to limit their existing role. This paper will evaluate the new roles in construction emerging in the Dutch PSIBouw programme.

Keywords: roles, actors, construction, new business models

INTRODUCTION

End 2008 the PSIBouw programme in the Netherlands was finished after a period of four year. The abbreviation stands for Process and System Innovation in Building and Construction. The purpose of this programme was to contribute to the transition the Dutch construction sector. It was a joint initiative of industry, government and research

institutes following the Parliament Inquiry in 2002-2003 towards fraud in the construction sector. It was supported by three Ministries: Trade & Industry, Housing, Spatial Planning and Environment and Transport & Civil Works and launched end 2003. These ministries all formulated their own goals for the programme, which are centred around four principle themes: restoring trust in the sector; creating effective market mechanisms and transparent competition; promoting professionalism in procurement processes; instilling high standards throughout the supply chain and “less but more effective’ regulation [Ang 2004].

The programme formed a central point for knowledge creation and dissemination in Dutch construction for a four year period. The work for transformation still continues, since a programme in itself is not enough to ensure a complete transition of a sector. This comes as no surprise. A period of thirty to forty year is usually needed for a transformation of this magnitude [Rotmans 2005]. Results of the programme are still accessible from their website (www.psibouw.nl) and their legacy is continued by the RegieRaad Bouw.

During the course of the PSIBouw programme many different and divers research topics have been addressed. This paper will look back at the results and aims at clustering insights on renewed and new roles as they were emerging form different projects within the PSIBouw programme. Main source for this reflection are the reports from the different research and pilot projects, as they were available at the website www.psibouw.nl in the period from 6th to 12th of January 2009. In addition information was used from other PSIBouw publications and information that was shared at PSIBouw events.

NEW PARADIGM

PSIBouw was put in place as an ingredient in the change process of the Dutch construction sector. There is a fundamental change in construction in the making, not only in the Netherlands regarding reform programmes and initiatives in the UK, Singapore, Denmark, Australia, Norway, HongKong, Finland (Ang 2004) etc. We come from a situation in which building companies are strongly orientated to the realisation of projects. The common basis of these projects is: the client asks for something, which the contractor, with the help of other companies, will realise. The contractor will hire suppliers and subcontractors on an ad hoc basis. Risks and costs will be specified in contracts according to the back to back principle. This means that each participant in the project will have a piece of the responsibility in the form of specific elements and tasks. Together these companies form a fragmented value chain in which it is difficult to build on earlier experience and innovation across organisations is a difficult process.

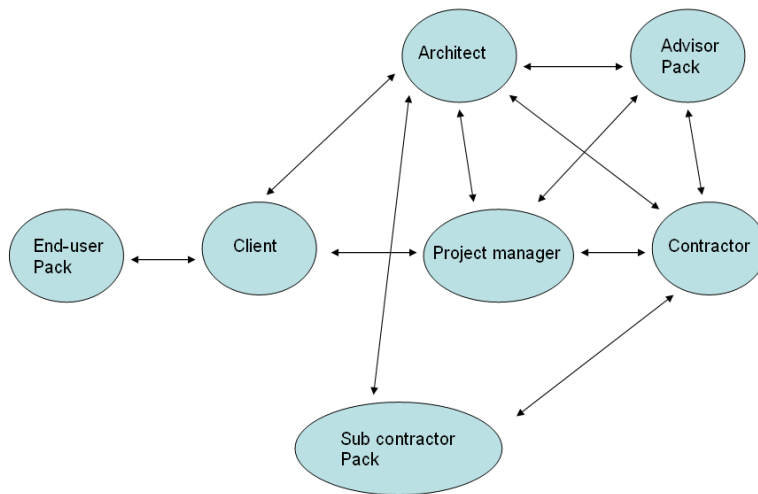


Figure 1 – the communication process between ad-hoc project partners in construction

As society we constantly strive to improve products and services in construction. This means the demands and constraints on these processes will increase over time. We, as society, demand higher quality levels (comfort, health and safety), quicker outcomes, life-cycle focus (adaptability to change, design for maintenance and exploitation) and a decrease in use of resources (material, energy, emissions and waste). On top of that end-users demand more influence (choice, flexibility of use, changeability). The market on the other hand looks for ways to realize healthy profit margins that makes entrepreneuring in construction appealing. Within PSIBouw this paradigm shift was summarized in eight necessary changes (see Table 1).

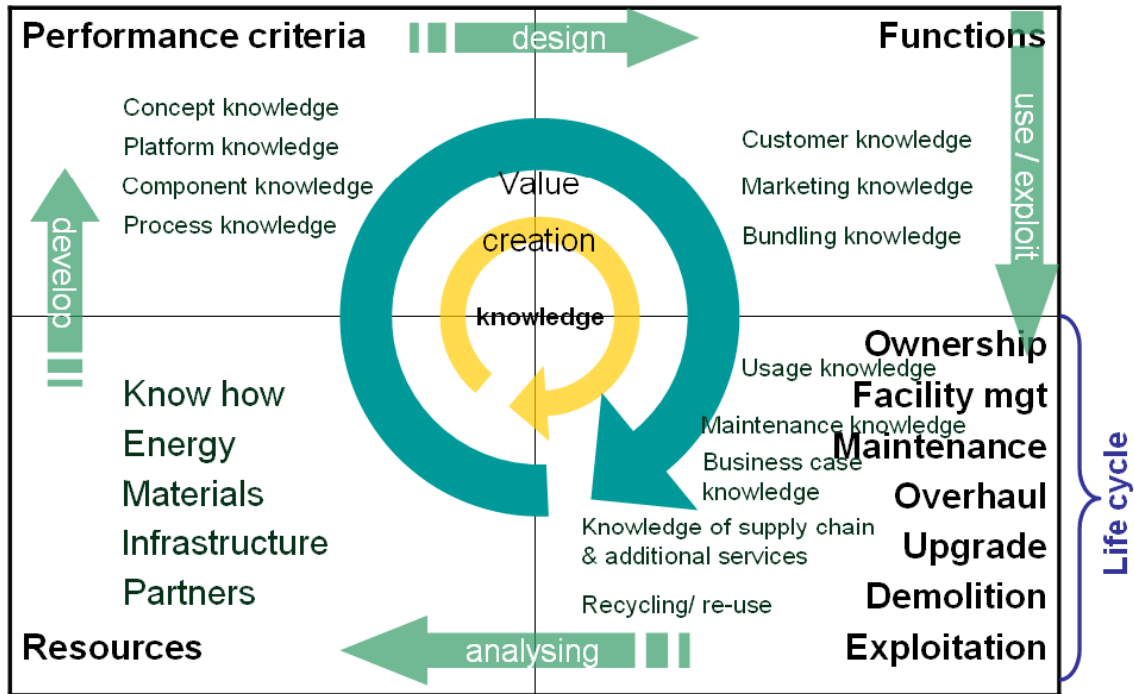
Table 1 - necessary changes as formulated within PSIBouw (Verbaan 2008)

FROM	TO
Static control of the product	Dynamic control of the process
Project oriented	Life cycle oriented
Parties involved in realization	All life cycle stakeholders
Fragmented value chain	Integrated value chain
Split risks and costs	Management of risks and costs
Focus on lowest delivery costs	Performance against life cycle costs
Price at delivery	Total value
Initial investment	Life cycle financing

These changes are causing a change of focus towards value adding on a life cycle basis. This new paradigm will bring an entirely new way of doing business. Building long term relationships with clients will become the norm, which will mean that the entire life cycle will need attention. To be able to respond to these complex assignments contractors, suppliers and subcontractors will need to form integrated value chains.

These integrated chains will make it possible to innovate and set ambitious goals in order to realize high quality and sustainable buildings with additional services.

Figure 2 – New Value Creation Cycle (Oostr 2008)



The shift towards a new paradigm in construction will put the creation of value, in the eyes of the client, central in the formulation of new business models. Central question is: how to create value? In principle this question evokes an ongoing circle which starts and ends with knowledge of every aspect relevant for value creation.

Starting point is the customer. Goal: to know customers better than they know themselves. This makes marketing knowledge essential, a field that is not so common for building companies at the moment. This marketing knowledge not only contains a thorough understanding of the requirements of end users and the translation of those in concrete performance criteria and subsequent parameters, but also knowledge of target groups, market potential, life styles, customer behaviour, scenario development and more. If you know what is important for end users and clients, the accumulation of bundling knowledge can begin. How to bundle possible features in buildings and services? What are essential functionalities, what are essential services and what can be the wow-factor that helps to persuade clients to choose for your business proposition?

Building and services have to be developed that fit the required business proposition. This bundle will be evaluated for its performance during the entire life cycle. Costs and functionalities at completion are no longer the only criteria. Now also performance, functionality, easy of exploitation, durability and maintenance during the rest of the life cycle will be considered. And what about flexibility and adaptability? What will it mean for the rest value of the building at a specific time in the future?

To fulfil all the requirements a thorough knowledge of resources is essential, and not only about materials and the building components that are made out of them. But also knowledge of energy will be relevant, and what knowledge possible partners have and knowledge of infrastructure to make the logistics work, how to communicate effectively

with (possible) clients and end users.

Another essential step is of course how all these resources, information and requirements translate into meaningful building concepts, product platforms, components and efficient processes.

Evaluation, monitoring and translating learned lessons into improvements, innovations and new concepts on all aspects are a last essential step that makes the value adding circle go on indefinitely.

To have an idea what the new paradigm in construction looks like is one thing, but what does this mean for the roles as we know in construction? To get an idea an overview is made from ideas in relation to current parties (end-users, clients, project developers, municipalities, architects, builders and suppliers) emerging within results from the PSIBouw programme.

END-USERS / CITIZENS

Local and central government are diminishing their tasks, leaving behind broader roles for private initiative. In addition citizens demand more influence. Citizens are able to make their own choices on a growing amount of topics. There is an increasing number of products and services that can be customized (from telephones towards cars, from insurances to health care and terms of employment). These trends increase the urge for end-user involvement in the built environment. When asked why people do participate in end-user programmes, answers normally are: for the interaction with their neighbours, to influence the outcomes, interested in information / knowledge (Werter 2008)

Vogelbuurt in Hellevoetsluis

One of the most interesting projects in this respect is the Vogelbuurt in Hellevoetsluis. Here citizens were given control over the public space of their neighbourhood as much as current rules and regulations allow. The municipality had the ambition to increase the quality of life in the area, which was not only translated into high quality level of housing, but also in the quality of the public space with green areas, playgrounds and street furniture. The neighbourhood, a redevelopment area from the sixties with 14 nationalities, included the renovation of 78 houses, the demolishing of 60 houses and the realisation of 145 new build homes (62 rented, 83 privately owned). In this project all parties took on new roles. The neighbourhood's citizens made the design for the public spaces. They were helped with knowledge from the municipality concerning parking, quality of life, accessibility of buildings, light in public spaces, waste & water management and ecological structure. Efforts were made to include everyone in the area in the formulation of the brief and everyone was given the opportunity to get involved in the process. Hereto a lot of effort was put in organising personal contact and the organisation of events to really involve everyone. The following priorities were formulated for their neighbourhood by the citizens:

Safety (light & traffic speed)	31%
Green	21%
Play facilities under 12 years	14%
Look and feel of streets	14%
Maintenance	11%
Play facilities 12-18 years	4%

Forty citizens took on the role of co-designer for the public spaces of the area. They

worked in groups of 10 people on parts of the area. Two landscape architects integrated the different designs from the citizens into one plan, which was heavily discussed among the different design teams and was checked on feasibility. The contractor translated this plan into a preliminary design that was presented to the municipality and the other citizens. Citizens were directly involved in the realisation of the public space and afterwards in the surveying the state of the area and the monitoring of the overall quality level. For this they communicate directly with the contractor, who was contracted as well for operation & maintenance. (Lievense 2008)

Solids

Solids (www.solids.nl) is a new concept of housing corporation Het Oosten based on the principles of Open Building. Currently two projects (7000 m² and 4000 m²) are being developed in Amsterdam. Renters are free to determine the amount of space they want to rent. The function of the space is free within legal limits, which would prevent for prostitution and drug sale among others, and the obvious restrictions for danger and noise. The basic idea behind the concept is to develop buildings with cultural meaning for its surroundings. According to Frank Bijdendijk, director of Het Oosten, buildings that will be redeveloped in the future possess two important characteristics: capacity for accommodation and lovability. (Bijdendijk 2006)

The envelope and structure of Solids are able to accommodate different functions which can be changed over time. End-users will determine their own customised solutions inside the buildings. "Solids" is an example of the Open Building principle in which the decisions that determine the appearance from the base building are separated from the infill. Building volume, façade and main installation infrastructure are standardized (e.g. distance between columns, size of openings in the building envelope, connection points for installations). Solids buildings are flexible to adjust themselves in order to meet new requirements, functions and people. The tenants are free to decide on the function and the layout of the areas they rent in the building. Solids puts end-users in new roles. At least they determine the configuration of the infill solution together with a professional. Probably quite a few tenants will take the role of (co-)designers of the infill and can be found to act as (co-)creators to realise part of the work.

Le Medi

In a lot of cities people from the middle class are not equally represented. The same holds true for Rotterdam. Therefore the aim of the new development Le Medi (www.lemedi.nl) in this city was to seduce young high educated professionals to become house owners in a former disadvantaged area. (Blok 2008). End-user centred development was used as a way to construct competing cities and regions. End-users were put in the role of co-designers and for help with the maintenance of their neighbourhood. The following advantages and downsides were registered in the project (Blok 2008):

dvantages:

- Dwellings, services and facilities are tuned to demands of focus groups
- Neighbourhood involvement increases
- New organizations will emerge
- Maintenance of neighbourhood will improve
- Effectiveness of development & maintenance processes
- Leads to stronger cities and regions
- The development of property value lies above those of other development according to ERA, the developer / builder of the area

Downsides

- Directed at self interests
- Can lead to closed communities
- Can diminish differentiation and obstruct emancipation of specific groups

CLIENTS

Professional clients can be important drivers for change, when they reformulate and reorganise their building assignments (Luiten 2004). Some interesting examples are already mentioned.

Solids

In Solids the housing corporation takes a leading role in order to stimulate innovation in construction, hereby influencing the roles of many any parties. They themselves take on an extra role in order to help tenants with the infill packages. Het Oosten is aware that they are creating a new sort of demand. They realise end-users need to be facilitated in order to smoothen the realisation of their concepts. Therefore a process is designed to support end-users to choose between different solutions and to make a configuration for their personal infill.

Hellevoetsluis

The municipality of Hellevoetsluis, in the position of client when restructuring the Vogelwijk, decided to diminish their traditional role. In line with the policy intention of a retreating government, this municipality already had experience outsourcing different tasks. A policy trend they pushed even further with this project. This raised the need for the formulation of a new director's role, in which overview and control is maintained, but focus can be put towards policy making and controlling the outlines. An important motivator to do this is to achieve more value for money for its citizens, thereby using the potential of the market. With this approach the municipality also hoped to improve the relationships with its own citizens.

Supermarket chain

A relevant example comes from a research on strategy for entrepreneurs in construction (Dijk 2007): The head office of a super market chain had a dream: the re-modelling or renovation of shops within 24 hours, in order not to hinder customers and lose turn over. First they approached conventional builders but felt that these companies were not able to provide them with a solution. Determined to come up with dramatic improvements they themselves started the development of a new concept to remodel shops. They started their own design department, build partnerships with important suppliers and developed a concept to turn a shop around within a week.

Main characteristics of this method:

- self developed and monitored concept
- maximizing ahead thinking and pre-assembly
- strong focus on the logistics
- working with dedicated suppliers and partners
- treatment of these partners like they are an integral part of the super market chain.

This client made a shift towards roles of concept developer, designer, engineer and builder.

Kasteelschap

A new way of collaborating between housing corporation, municipality, developer and end-users emerged in the project Kasteelschap (www.kasteelschap.nl) in Almelo. The purpose was to try to develop more value for the end-user in the domains of living, care, work, mobility, learning and recreation. Contrary to the ordinary way of working, in which all different functions normally are separated, here functions are integrated into a total concept. The economic costs for society are increasing due to individualisation and aging population. Mutation of tenants and house owners due to changes in needs is not functioning properly, since people are attached to their living environment. Housing corporation Stichting Geïntegreerd Wonen (SGW) decided it was time to take on a different approach. It led to an integrated concept of products, services, facilities and infrastructure with the intention to create a new functioning community.

PROJECT DEVELOPERS

Another example from the research into strategy for entrepreneurs in construction (Dijk 2007): Project developer TCN turned around the principles of project development. They do not start from a location, as conventional project developers are used to, but start with a product concept.

Main characteristics of their strategy:

- develops concepts and looks for matching locations
- put the end-users and their requirements central
- take responsibility for both the construction as the exploitation period of the project which will lead to integration
- act responsibly considering impact on society as well as the environment
- facilitate the end users as much as possible, deliver all required services
- company culture: transparency, clear and simple rules, responsible, no hierarchy.

Within this example the project developer takes on the roles of owner, facility manager and a role in improving and maintaining the area.

MUNICIPALITIES

The Solids concept demands a change of regulations. These should be changed in order to allow end-users to determine the function and use of space. Normally the municipality wants these to be specified when a plan is submitted to the building authority.

In Hellevoetsluis the municipality wanted to revise their director's role in order to redevelop the Vogelbuurt. Knowledge available within the market should be mobilized and used as a result. And with the involvement of citizens the relation of the municipality was improved and at the same time participation enhancing feelings of belonging and commitment to the neighbourhood. By this new way of organizing the assignment the total costs were diminished with 15%.

ARCHITECTS

For Solids the architect will design the base building. The end-user will design the infill, with or without help from others. Of course the end-user could hire an architect to

design a dedicated infill.

Within the PSIBouw programme there was not a lot of attention for the role of architects, except for one research. This is a research specifically directed at the role of architects in innovation in relation to life cycle perspective, value creation and supply chain integration investigates possible roles in process innovation for architects in system integration. (Renier 2008a) Barbara Renier and Leentje Volker developed different profiles to categorise architects (Renier 2008b):

- design office
- integrated service provider
- product developer
- initiating system integrator
- coordinating system integrator
- producing system integrator.

More interesting results and examples on the role of architects can be expected from the PhD research of Barbara Renier and Leentje Volker.

BUILDERS

A dedicated research in the PSIBouw programme was focussed at the role of system integrator in construction which several interesting examples (Rutten 2007). It concludes that in general parties with a history of jobber take on the role of system integrator in construction. Several examples from builders and suppliers that developed into system integrators are presented. Examples from architects and project developers to take on this role were found to be scarce. More interesting information on this role is to be expected from the PhD research from Maarten Rutten. Other interesting examples within the PSIBouw programme include a project with More for You and an example used in a study on strategy, Burggraaff.

More for You

This company turned the approach of the contractor upside down and started with the end-user (www.moreforyou.nl). A first important step proved to be to gather knowledge on what it is end-users want. They realized that not all wishes and demands are made explicit. For example, the indoor environment has to be healthy. Most end-users would think this is taken care of in rules and regulations (het Bouwbesluit). By making these explicit it can become a topic for discussion and eventually lead to improvement of the building design. Ambition is to create 25% more value for end-users. Second important step is to make the consequences of choices transparent. Therefore all kinds of clever tools needs to be build in combination with 3D modelling in order to make consequences for building costs and energy consumption explicit.

Supply chain management is necessary to integrate current process steps. More for You claims for itself a role as supply chain director.

Burggraaff

Another example from the research into strategy for entrepreneurs in construction (Dijk 2007): Burggraaff, a contractor focusing on the housing market decided to reconsider his business strategy after a period of economical recession. A considerable amount of local competitors did not survive the period and triggered the management to reframe its business strategy in order to be ready to take on future recessions. They decided to work towards standardization of the products in combination with

standardization of the process and to target a specific niche market in housing; people building on their own lot. To provide options in line with differences in the requirements of different client groups six life-phases with their own specific needs were defined:

- Starters – a low budget
- Dinky's – higher budget and a wish for more luxury
- Couples with young children – need for more space and a save place outside to let children play, all within a tight budget
- Couples with older children – desire to return to city centre, wish for workspace and space for hobbies
- 50+ – bedroom and bathroom downstairs; requirements for quality and location close to the city centre
- 60+ – they require a location close to facilities such as shops, healthcare and public transport; they wish to be in the proximity of entertainment facilities for social contacts.

This builder transformed into a system developer, and they developed specific marketing tools. They work with industrialized building concepts, standard components, off site production and selected partners

SUPPLIERS

Supermarket chain

Suppliers had to develop new integrated products and systems in order to be able to achieve the ambitions of the supermarket chain. They thereby took on a new role as system integrator.

Burggraaff

The builder Burggraaff works with standard components, for example prefabricated bathrooms, brick walls etc. They work with five main suppliers that are regarded as partners in order to streamline products and processes. Suppliers are actually co-makers and are regarded as part of the company family. These suppliers develop components as part of the overall system of Burggraaff, and therefore act as co-developers of the building system.

CONCLUSIONS

New business models will automatically affect the roles common parties in the construction sector can have and will have.

There is an opportunity for existing parties to extend their role with tasks that used to be performed by other existing parties (forward and back ward integration). A contractor for example can decide to provide service to their clients and extend their role with maintenance activities.

New business models will also lead to new roles. For example in placing the end-user central will require a facilitator that supports end-users in the design and the realisation of their specific fit out.

On the other hand parties may wish to limit their existing role. Municipalities for example can chose to outsource aspects of their work towards market parties in order to

deal with capacity restraints of their organization.

The (re-)new roles emerging in the PSIBouw programme are summarized in the table 4.

Table 4 – renewed and new roles emerging in the PSIBouw programme

	INFILL	BUILDING	AREA
Citizen / end-user	Owner, co-designer of configuration, co-maker		Source of requirements and location specific idea's, co-designer, role in maintenance
Designer	System designer, end-user specific configurations, system integrator	System designer, project specific configurations, system integrator	General urban design, facilitator of stakeholder input
Client / housing corporation	Facilitator for end-user configurations	Professional client conscious of role in supply chain innovation, concept developer, designer, builder	Role in improving and maintaining quality of the area
Project developer	Facilitator for end-user configurations	Client centred project developer, owner, facility management	Role in improving and maintaining quality of the area
Municipality	Adjusting role as regulator	Adjusting role as regulator	Director on outlines with ambitious criteria commercial developments
Builder	System integrator and developer	System integrator and developer	Coordination of input in (re)development phase, operation, maintenance
Supplier	Developer of integrated components	Developer of integrated components	Sponsor

An additional conclusion is the observation that these new roles are more directed towards cooperation. This means cooperation between different roles becomes professionalised. Different ways of collaborating can be distinguished between:

- parties in the supply chain
- between citizens / end-users and professional parties leading towards society-building
- between professional parties in special consortia around projects or areas like Kasteelschap and Hellevoetsluis

In order to facilitate cooperation a demand for new organisation forms with additional tools and methods has rises. It is therefore no wonder that a considerable amount of

effort within the PSIBouw programme was put in the development of these.

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