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WORK-ARCHITECTURE, A NEW SPACE FOR REAL ESTATE

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Supply Chain Networks, Bundled Offerings, Real Estate, Information Age, Transaction Costs

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## Introduction

Corporate Real Estate is broadly understood to be real estate in use by a firm, its possessive noun “corporate,” a legacy from when most corporations, or firms, both owned and operated their real property. Corporate Real Estate has been defined as “...*a major part of the real estate economy’s demand-side and houses the productive or business activities of an organisation that owns or leases real estate incidental to its business objectives, where the primary business is not real estate*”.(Kenley, Brackertz, Fox, Heywood, Pham, Pontikis, 2000)

In Porters (1985) prevailing Value Chain model of the activities within the firm real estate is described as infrastructure. Infrastructure by definition supports or underpins but does not form part of. For Porter infrastructure is a secondary activity distinct both from the other secondary activities of human resources and information technology and also from the primary activities of the core business of the firm it supports.

In the information age the relationships between those functional groupings within the firm which organize its activities and resources, that is a firm’s organizational architecture, have become more complex. The resource of real estate may act as supporting infrastructure or be procured through an outsourced commercial real estate, property or facilities management services firm. It may be purchased whole or in part, outright or leased, and separately or bundled together with strategic planning, information and communications technology, and added concierge services. It may act as a secondary resource supportive of a firm’s core business but it may also form part of the core capability of a primary activity and be procured in the same manner as the firm’s primary inputs. A commercial real estate firm, whose primary business *is* real estate, might name these real estate resources and capabilities, whether in-house or external to the firm, in either its own organizational architecture or that of the outsourcer, “Corporate Real Estate” or “facilities”, “Infrastructure” or an “Integrated Solution.” In the information age there is a need for a new model of the real estate space which simplifies this new complexity.

Adopting the Resource Based View of the firm and using an overview of the Information Economics and business literature on Transaction Cost Theory of the Firm this paper describes two information age characteristics which are essential to the transformation of the way real estate is used by firms: 1. Recombinant Real-estate Supply-chain networks and 2. Bundled, material, human and informational, resources and capabilities. This literature is then used to support the Work-architecture model which appends Porters (1985) Value Chain model. Finally the Work-architecture model is applied across examples of traditional and innovative offerings in which real estate plays a part. These include: Airbnb, an offering which bundles residential real estate with the information technology of an app and

dis-intermediates hotel companies completely out of their supply chain networks; Plug 'n' Play or serviced offices which can be leased on very short minute or hourly leases and which bundle a commercial real estate space booking app with utilities, furniture, and concierge services and which sit on a supply chain network which intermediates between sub-tenant and end user whether firm or individual; and Cross Docking, as recently announced by Amazon for its China operations, in which warehousing- an erstwhile secondary activity frequently outsourced, is brought back within the firm, acknowledged to be a primary activity just long enough for it to be completely dis-intermediated from its supply chain network by an app which enables the tracking of incoming goods to be transferred from transport mode to transport mode across the dock, avoiding warehouse real estate altogether.

The significance of the Work-architecture model for the real estate professional is that it involves skills which cross between material, human and information resources and capabilities but does not necessarily exclude the need for specialist expertise in any one category. So long as humans continue to have corporality, have not been replaced by cyborgs or robots, and continue to have the need for shelter, real estate is not going to suddenly dematerialize. However real estate professionals require a better understanding of the new space for real estate in order to anticipate, adapt to, create value through, or even be the innovator of new Work-architecture offerings.

### **The Boundary of the Firm**

Ashkenas et al (1992) in writing in the business literature describe the information age firm as a "Boundaryless Organization" with vertical, horizontal, and geographic boundaries having been "crossed" and their being free movement of goods through and out of the firm and into the supply chains. An overview of Transaction Cost Theory of the firm from Economics literature reveals a more nuanced picture. While some boundaries have been crossed, other boundaries have been reinforced or created. Importantly while the boundary of the firm may shift it remains definitive, reinforced by corporate law and transaction costs on either side of its boundary which serve to define the firm itself.

Ronald Coase (1937) bases the very existence of the firm upon "marketing costs." He asks if, as Adam Smith had famously observed, markets were the most efficient way to undertake transactions - why do some transactions take place inside the firm? Coase (1937) reasons that this is because those transactions which took place inside the firm avoid the "marketing costs" which occur if those transactions take place beyond the boundary of the firm in the unassisted market place. These marketing costs involve the cost of price discovery, negotiation costs and the ex-post haggling over price and the

division of surpluses. Coase's theorem (1937) states that in the absence of these marketing costs all transactions flow to where the economy would use them most efficiently.

Coase's (1937) marketing costs have since become known as "transaction costs" and become the foundation of the Transaction Cost Theory of the Firm. A major contributor to this theory is Oliver Williamson (1975, 1979, 1981) who adds ex-ante costs to Coase's ex-post costs and further differentiates between those transactions undertaken inside the firm, those undertaken in the external market, and those undertaken in some hybrid of the two. He describes how transactions require ex-ante investment in physical or human assets which are in their highest and best use when specific to that asset. The specificity of these "dedicated assets" is drawn from their customized characteristics such as, in the case of physical assets, the location of buildings and facilities, or in the case of human assets, specialist training. The greater the need for investment in the specificity of these physical and human assets the more efficient it is for that transaction to occur within the firm than for it to occur in the unassisted marketplace (Williamson 1975, 1979).

Williamson (1975, 1985) also describes the difference between the risk and incentives involved in those transactions which take place within the firm and those that take place in the external market. Accepting the bounded rationality, guile and opportunism of all parties, ex-ante investments in assets dedicated to market place transactions could expose the party who had made the greater investment in these customized assets to "lock-in." This may occur when an opportunistic buyer, in the absence of a significant number of alternative buyers, renegotiates ex-post to the transaction, exposing the seller who has made the larger ex-ante investment in those specific, customized, dedicated assets to become locked into the transaction and not be able to cancel or get out of it without significant cost. This Williamson (1985) describes a "hold-up" – of the party with the greater investment in the transaction by the party with the lesser investment in the transaction and who is therefore in the stronger ex-ante negotiating position and could threaten or be able to walk away from the transaction with lesser cost than the other party. Furthermore he prospect of a hold up may discourage the party with the greater investment from undertaking the transaction in the first place which is good for neither, both parties missing out from the benefit of the transaction. Consequently both parties stand to benefit if they developing structures of market governance and safeguards which instill confidence and prevent opportunism (Williamson 1975, 1985).

Grossman and Hart (1986) and Hart and Moore (1990) describe how contracts can be used to solve the hold-up problem by. Contracts are written or spoken agreements which are enforceable by law but are necessarily incomplete in that they cannot anticipate all contingencies. In order to prevent

opportunism, instill confidence, and safeguard the party with the greater investment in a transaction, a contract can award all residual claims, the greater surplus, and the right to walk away, to that party. The contract can also stipulate that the other party with the lesser investment in specific, customized dedicated assets, be committed to the transaction so cannot just walk away. This removes the threat of hold-up by the party with lesser investment, usually the buyer, of the party with the greater investment in dedicated assets, usually the seller.

### **Information Goods and Recombinant Supply Chain Networks**

Keith Oliver (1982) describes a “supply chain” of moving and storing materials and inventory from the point of origin to the point of consumption. This term is now become widely used and describes the field of work in the disciplines of operations, economics and management. More recently supply chain has become interchangeable with the term “supply chain network” which is used henceforth in this paper in recognition of the multi-nodal, multi-modal, shifting path of the flow of products and services within and between firms.

A supply chain network is connected by nodes. At each node is a transaction and usually a contract which describes and binds the agreement of the relationship between those firms on either side. In the real-estate supply chain network, down-stream from those firms which have procured the land, developed, designed and constructed the buildings facilities, are nodes with transactions and contracts for real estate sales, leasing, facilities management and other bundled operational services. These contracts may be purchase agreements, leases, competitive tenders, outsourcing contracts, strategic alliances, and require going to the market or renewing or continuing a long standing agreement. At each market based contract real estate demand meets real estate supply.

The preparation and administration of any contract involves some combination of human labor and knowledge, the physical materials including the buildings and facilities required to house the human resources preparing the contract and the information depicted in these contracts. This information can be further divided into - the message - the content of the contract, and the presentation, production, reproduction communication and telecommunication of that information – the medium. In these information goods, both the medium and the message has been transformed.

Information goods have long been recognized as having different characteristics from material goods and from human services. In the discipline of Economics the marginal cost of any good, whether material or informational, is understood to be the fixed cost of producing the first unit of that good plus the variable cost of producing each subsequent unit. Thompson (1982), writing at the advent of the

information age, describes information goods as being comprised of high fixed costs but variable costs which, unlike those of material goods, are effectively zero. While there is some fixed cost associated with the medium which presents, reproduces and communicates these information goods the variable costs are effectively negligible because they require the consumption of almost no additional resources to produce. For Thompson(1982) the marginal cost of producing the next information good is almost nonexistent.

For information goods these fixed costs entail that of the hardware and software, and variable costs an increment of electric power. While in aggregate powering the information goods of today's profligate social media usage and the internet-of-everything which is suggested to be applied to all building management from usefully opening a roof top economizer and shutting a solar window to the trivia of seeing what is in the fridge, involves electricity usage that is clearly existent if not existential when accounting for the externalities of climate change, Thompson (1982) was not describing an aggregate of these costs but each marginal cost. This view of the marginal cost of an information good is now shared by most economists and demonstrated in the profitability of high technology businesses where content is user generated and the marginal cost of an information goods is a fraction of the cost they can charge advertisers per view.

Shapiro and Varian (2003), also working with Transaction Cost Theory of the Firm characterize information goods in more detail. Information goods must be experienced to have value. They are costly to produce but cheap to reproduce and so can be copied cheaply but are notoriously subject to "switching-costs" (such as switching from one hardware platform to another), and lock-in due to the standardization of hardware and software which requires that employees accumulate knowledge as to of how to use them. (Shapiro and Varian 2003)

Contracts can be viewed as an information good. The negligible marginal cost of information goods means that contracts and agreements between firms have become cheaper and easier to manage in the information age. This has reduced the difference between the cost of undertaking a transaction within the firm and doing so in the external market, the cost of undertaking a transaction nearby and at distance which, along with some herd mentality, has resulted a continuing shift from owning to leasing real estate and the outsourcing of real estate operations.

In Godfrey (2007) hoping to give pause to the decision to outsource Facilities Management services we asked whether a) It is possible to separate a core from a non-core Facilities Management activity b)The operational data generated by outsourced service provider can be aggregated, turned into an information good with value, fed back to, and owned by the owner of the building, and so the virtual building can be sold or leased along with the physical building it represent, c) That it is efficient or even

possible for Facilities Management activities to be described and controlled by performance criteria written into a contract d) There are a enough alternative service providers outside the firm to create a “market” in which they must compete to avoid the monopoly an uncompetitive in-house provider being replaced by the monopoly of an uncompetitive outsourced provider, e) Outsourcing is suited to the firms culture, f) The demand for goods is too variable or short term to justify the investment in dedicated material human and informational assets within the firm.

In the information age the difference between transacting within the firm and in the market is less. While it costs less to outsource there remain reasons to keep activities within the firm. The firm is not “boundaryless.” Its boundary remains, positioned by factors including the incomplete nature of contracts which can never account for all contingencies, asset specificity and switching costs.

Brady Davies and Gann (2005) describe an integrated solution offering which spans all or some of the life-cycle of a building, from pre-bid to post implementation through specification, design, deliver, finance, maintenance and operations as an Integrated Solution. As the transactions and the boundaries of the firm shift so do the nodes on the supply chain network. In the information age, the Real Estate Supply Chain Network has become recombinant.

### **Bundling, Information Goods and the Functional Boundaries within the firm**

The organizational architecture of a firm can be defined as the configuration of the functions or departments which manage its activities. For Porter (1985) this architecture is depicted in his influential Value Chain model which has endured these past thirty years relatively intact.

Porter, a management theorist, like the economists Coase (1937) and Williamson (1975, 1985) works within what has since broadly become known as the Resource-Based View of the Firm. The Resource-Based View sees the firm as a collection of heterogeneous and relatively immobile resources which the firm turns to its competitive advantage (Barney 1991). Amit & Schoemaker (1993) made a further distinction between a firm’s capabilities which are specific to the firm and resources which are not.

For Porter the Value Chain is “*the set of activities an organization carries out create value for its customers*” (Porter 1985) In it there are nine interdependent value activities, five of which he describes as primary activities and four as secondary. Primary activities are Inbound Logistics, Operations, Outbound Logistics, Marketing and Sales and Service and these occur sequentially, as in a chain. These primary activities are supported by secondary activities: Procurement, Technology Development, Human

Resource Management and Firm Infrastructure the latter being Porters' space for real estate. Three of these secondary activities: Procurement, Technology Development and Human Resource activities occur across all primary activities and also in sequence with the primary activities. Infrastructure, which includes real estate, alone out of the secondary activities, does not relate to the sequential primary activities. The horizontal chain of activities within the firm links to activities outside the firm in a value system (Porter 1985).

**Fig. 1. The Generic Value Chain (Porter 1985 Fig. 3.2 pg. 37)**



The division between primary and secondary activities is a reflection of the different tax treatment of the activities associated costs. By accounting convention direct costs are incurred by primary activities include raw materials and freight, storage, direct labor etc. while indirect costs are operating expenses incurred by secondary activities such as repairs and maintenance which unlike primary activities receive tax deductions. While continuing to represent a difference between the cost treatment of activities the boundary between primary and secondary activities shifts.

The linkages between Porter's activities are "*relationships between the way one value activity is performed and the cost or performance of another.*" (Porter 1985 Pg. 48). These relationships are involve agreements if not formal contracts and are similarly affected by the marginal cost of information. Transacting across the internal functional boundaries of the firm has therefore become cheaper and easier and necessary in the production of bundled offerings.

As the marginal cost of an information good approaches zero, in addition to reducing the cost differential between transacting within the firm and external that the firm, the cost of adding an information good to a material product or human service becomes almost negligible. Adams and Yellen



(1976) appear to have been the first to describe a “bundle” which they said as being comprised of two distinct but complementary goods that can be bundled together and sold for a single price higher than that of each good alone. This they saw as being particularly well suited to the adding of an information to a material good, the marginal cost of the information good being almost negligible (Adams and Yellen 1976).

The bundling of human services and material goods is described as a “Product-Service System” *“a marketable set of products and services capable of jointly fulfilling a user’s needs”* by Goedkoop et al. (1999 cited by Tofell 2008 pg 18.) Tofell (2008) finds this an overreaching definition and narrows his description to “servicizing” those offerings provided by manufacturers who once sold the product alone, but no longer sold the product but only its functionality while supplying maintenance at no additional cost.

In the real estate space there is nothing new or innovative about a contract that gives the right of possession and use, but not ownership. It has long been known as a lease. Furthermore the “Servicize” concept may be hard to distinguish from a service for the end user agnostic to its history and whether the firm upstream on the supply chain network from whom it is procured had once manufactured and sold the product alone, or did or continues to procure from yet another upstream firm in the real estate supply chain network.

Product-Service systems themselves are not new either. Neither a product nor a service has ever been offered entirely separately and exist along what the marketing discipline has long called a product – service continuum. There are products only requiring a little bit of a service at one end and services only requiring a little bit of a product at the other end. The bundling of products and services is not new, however in the information age the widespread bundling of products and services with information goods is. There emerges the need to triangulate the product-service continuum to include information.

## **The Work-architecture Model**

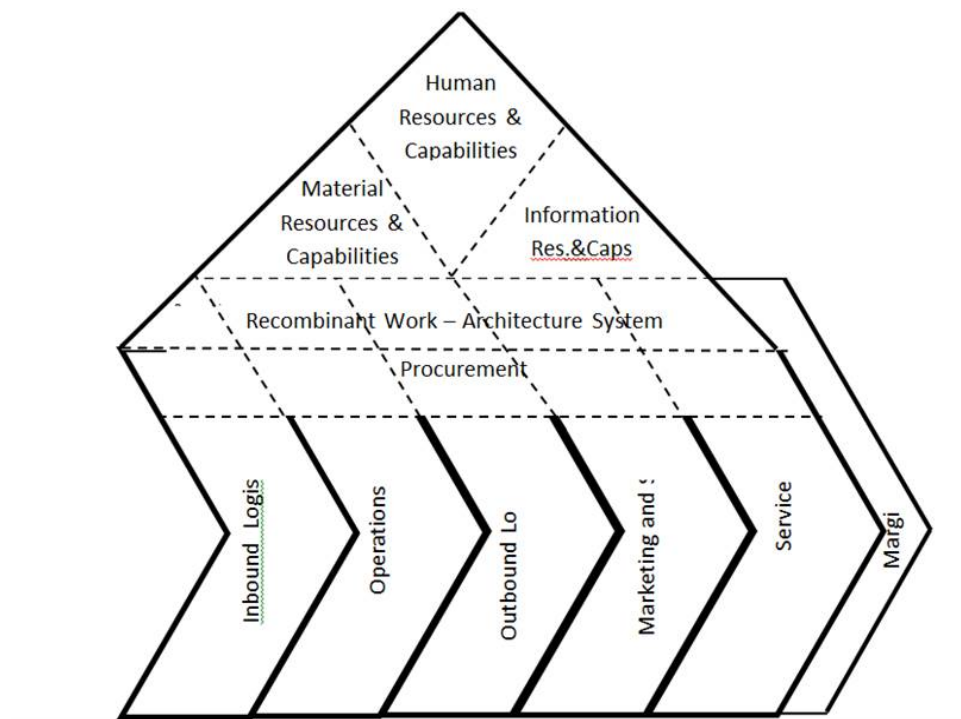
Max Weber (1946) describes the organizational architecture of a bureaucracy as having “pure technical superiority” because of its compared favorably with other forms of organization as does machine does with “non-mechanical” modes of production (Weber 1946). For Weber the mechanical machine is the metaphor for the firm. For the management guru Porter (1985) it is the chain, Oliver’s (1982) supply chain internalized within the firm. In the Work-architecture model the metaphor for the firm is a circuit board, into which material human and informational resources and capabilities can be

plugged or unplugged, either in substitution or in combination, in percentages of zero to one hundred, and through which activities and value streams flow like a current in order to enable the work or the firm.

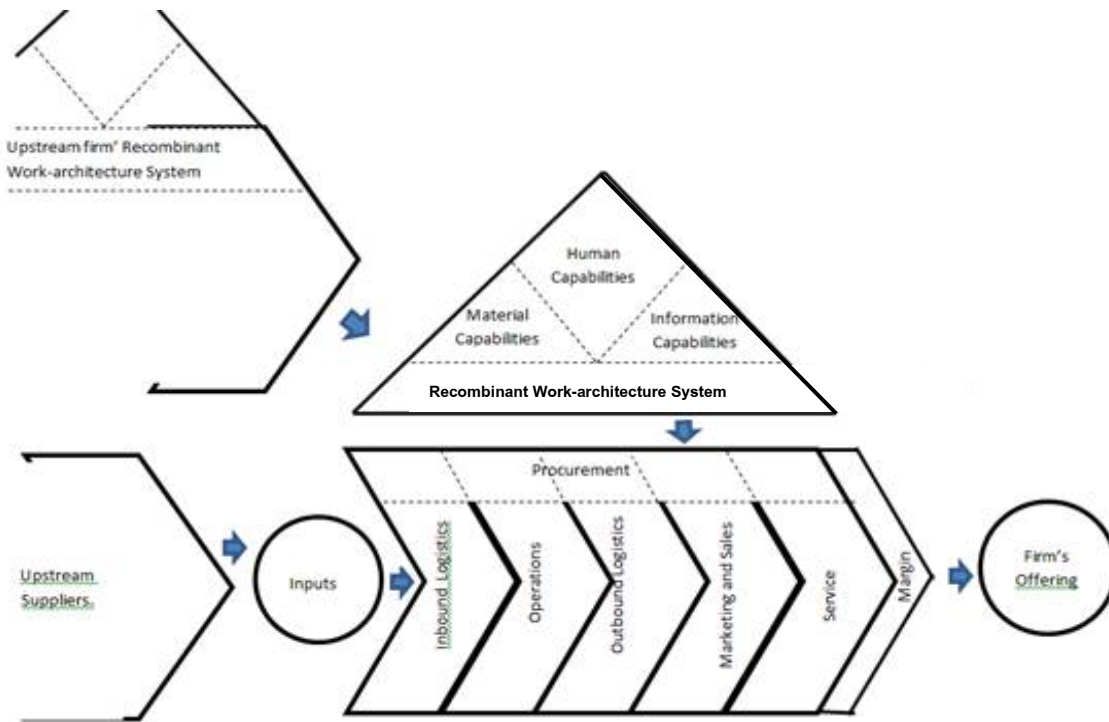
In Godfrey (1998) I describe a dynamic “organizational, technological and built architecture” offering: the 2000 Sydney Olympics. The global consumer of this recombinant offering purchased not only the spectacle of Olympic athlete’s performance but also that of the Olympic facilities along with their represented, enhanced, or at least transformed, virtual representation through information and communications technology. All three are recombined in offerings for consumer gratification in the grandstand or on the sitting room TV.

The Work-architecture model sits atop the primary activities in Porters (1985) Value Chain model. Inbound Logistics, Operations, Outbound Logistics, Sales and Marketing, and Service. It replaces three of Porters (1985) secondary activities: Infrastructure, Human resources and Information Technology with three spaces for the resources or capabilities: Materials - assets including real estate, Human Resources and Informational – both the information message and the information and communications technology medium for the representation, reproduction and communication of that message. These are resources and capabilities, and are “recombinant” rather than “integrated” in recognition that they may combined and recombined within within the life of the firm.

**Fig. 2. Recombinant Work-architecture within the Firm**



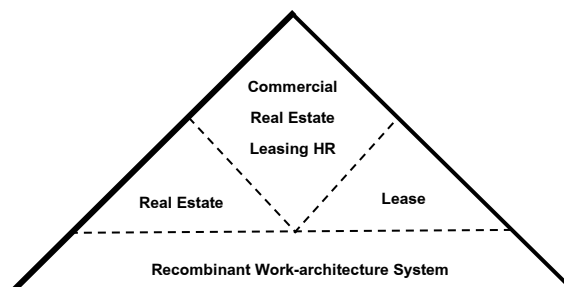
**Fig. 3. The Work-architecture Offering** shown as procured from the recombinant Work-architecture System in a firm upstream in Supply Chain Network. The Procurement function may also procure core firm inputs:



## Examples of Work-architecture Offerings

### Eg. 1 Leased Real Estate

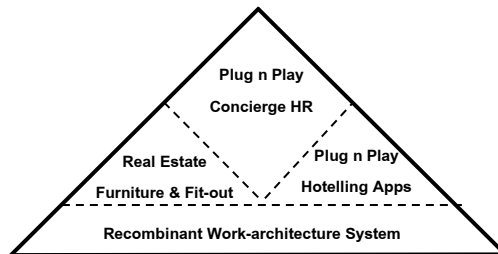
Leased real estate is a work-architecture produced either within or external to the firm whose work it enables. The work-architecture offering bundles the human services of leasing staff with the physical goods of commercial real estate and the information goods of advertising and the lease document itself which can be paperbased or digital and managed online.



### **Eg 2. Plug n Play Work-architecture Offering**

The Plug n Play firm intermediates the supply chain network between owner or tenant and the end user. The Plug n Play work-architecture offering bundles the materials of commercial real estate, (frequently sublet office space furniture) with furniture and and fit-out, on very short leases or subleases of days, hours or even minutes with human resources of concierge services, and the information goods of the sub-lease document and information technology of ‘hotelling’ or space booking apps.

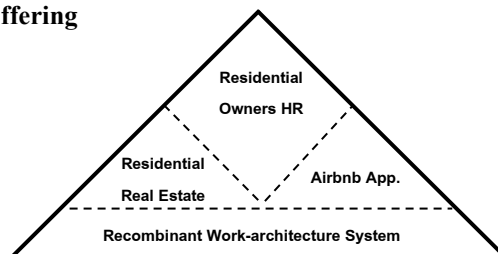
**Fig. 4 The Plug n Play Work-architecture Offering**



### **Eg 3. Airbnb Work-architecture offering**

The Airbnb offering disintermediates hotel companies out of the supply chain network between residential real estate owner and short term or overnight user. The Airbnb work-architecture offering bundles the materials of residential real estate, (frequently sublet office space furniture) with the Human Resources of the residence owner, the remote Airbnb firm and Airbnb app and database.

**Fig. 5 The Airbnb Offering**

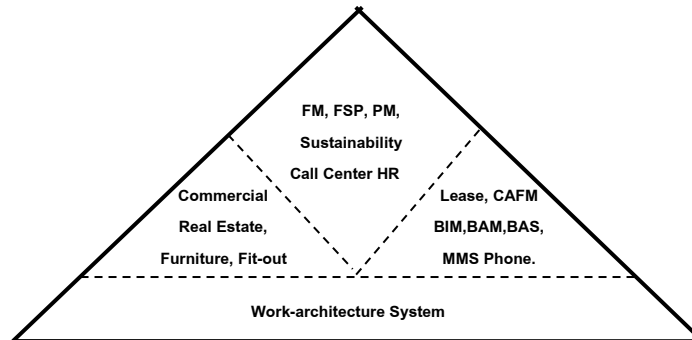


### **Eg 4. The Integrated Resource Solutions Work-Architecture Offering**

Integrated Resource Solution firms are commonly provided as offering external to the firm. The Integrated Resource Solutions work-architecture system recombines all or some of physical commercial real estate, furniture and fit-out, with all or some of the human resources for facilities strategic planning, facilities management, property management, sustainability management, supply chain network

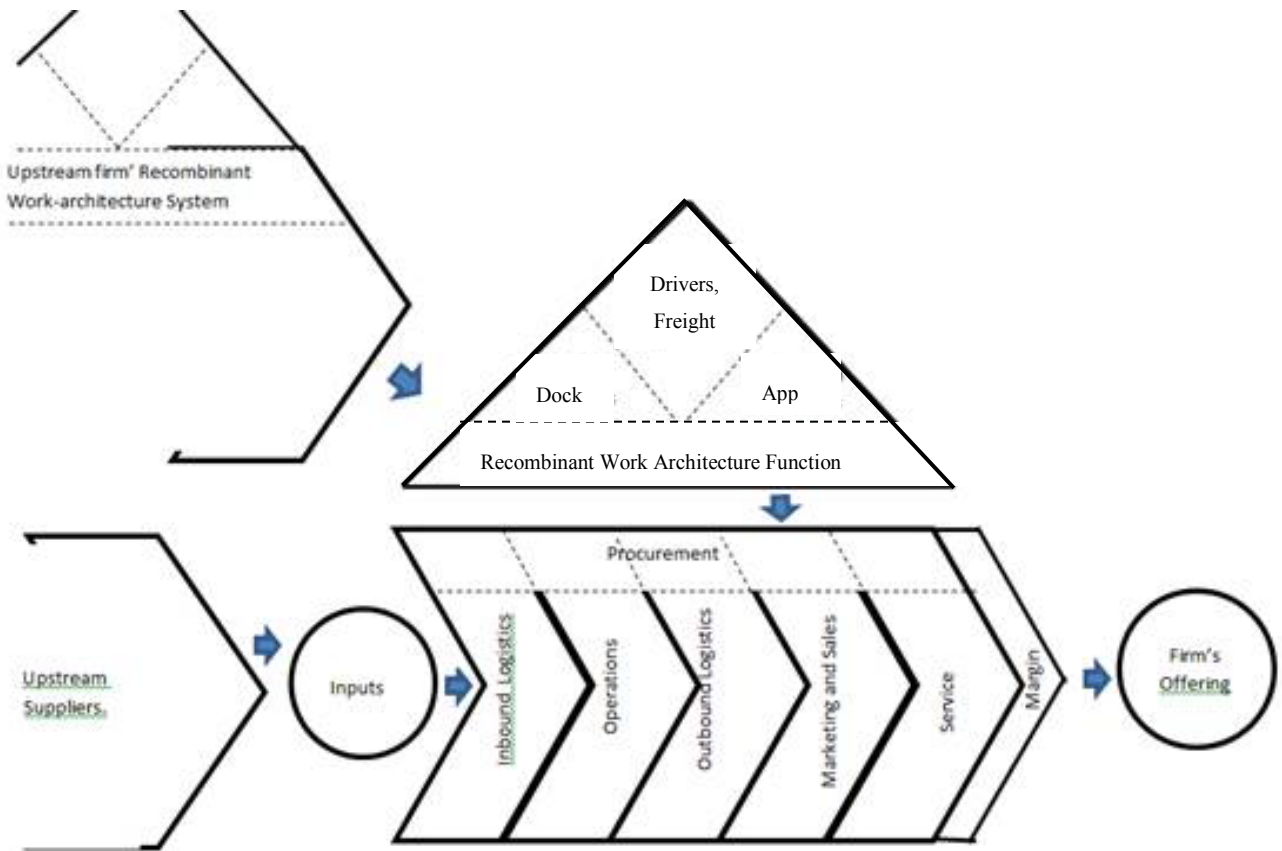
management, and concierge services and with all or some of strategic plans, leases and operational plans information goods, and Life Cycle Building Information Systems, Building Automation Systems, Computer Aided and Integrated Facilities Management System, Maintenance Management Systems information technology. Call centers are added to the network with the call center work-architecture of the call center human resources bundled with the phone and maintenance management software.

**Fig. 6 The Integrated Resource Solutions Work-architecture Offering.**



**Fig. 5. Tenants FM Work-architecture Offering. Tenants FM can be offered either within the firm or outsourced downstream on the supply chain network.** offered within the firm who owns or leases commercial real estate to enable its work, or outside the firm to enable the work of a firm downstream on the supply chain network. The offering combines all or some of the human services of facilities management and concierge services. The Tenants FM work-architecture offering bundles these services with the material goods of leased commercial real estate, furniture and fitout, and the information goods contained with the technology of Computer Aided Facilities Management (CAFM) Computer Integrated Facilities Management (life-cycle CAFM) Building Automation Systems (BAS) also known as Building Management Systems (BMS) which provide real time building automation operations, Maintenance Management Systems (MMS), which manage work orders, Hotelling or online room booking apps. Frequently this work-architecture is procured at the same node as that of a Call Centers Work-architecture which bundles the human services of call center staff, either near or at distance, with commercial office space, and the information goods of the service requester/complainants messages (the marginal cost of which may make it an atypical information good) and the technology of a phone and screen access to a Maintenance Management System.

## 6. Cross Docking



Cross Docking, long used by Walmart and more recently by Amazon.com (Colby, R.C., and Dau, M.T 2005, Streitfeld, D 2016) is a work-architecture which recombines the human services of a truck drivers, train drivers, or freight handlers with the physical real estate of a dock, and the information goods within the technology of GPS, barcoding and freight management software in order to enable the exact tracking of goods and from transport mode to transport mode across a dock, avoiding warehousing real estate altogether. Cross docking requires that outsourced warehousing be brought back within the firm, recognized not as a secondary infrastructure but to have potential to change core logistics, just long enough for it to be completely dis-intermediated from the supply chain network and replaced by the material real estate of the dock and the information resource of the cross docking app.

## **Conclusion**

An overview of Transaction Cost theory of the firm and Information Economics identified two information age characteristics: recombinant supply chain networks and the bundling of material goods, human services and information goods and media, which have transformed the offerings and businesses in which real estate plays a part: the real estate space. This highlighted the inadequacy of the current conception of Corporate Real Estate and its fixed position as supporting infrastructure in the organizational architecture of Porters Value Chain(1985). The recombinant Work-architecture model was defined as enabling the work of an organization and developed as an annexure to Porters (1985) Value Chain model. The model was used to consistently position real estate within both old and new bundled work-architecture offerings in the recombinant supply chain networks of the Information Age.

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