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Think Piece

A Dynamic Model of Intangible Assets Creation in Companies and Stakeholder Value

Intangible Gold Project



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OVERVIEW

A Framework for Producing Intangible Assets and Stakeholder Value

A better understanding of the production, measurement and valuation of intangibles at the firm-level is a key ingredient for building a sound intangible economy infrastructure, as set out in the Intangible Reporting and Intangible Asset Charter Think Pieces by Big Innovation Centre¹. This understanding helps firms to discover the role of intangibles in their economic performance and growth so that they can implement appropriate strategies and governance forms. It also offers the prospect of directly informing the design of policy in order to build a fit for purpose intangible economy infrastructure and to identify the most suitable tools and the contexts in which these are likely to be effective.

Thus, this contribution looks at how intangibles and their value are created at the firm level and the role of stakeholder interaction. Addressing the role of fairness and relationships explicitly to be central to productive and distributive activities of an intangible asset-rich organisation is in line with the recent Corporate Governance Reform Green Paper², as well as the 'Building Our Industrial Strategy' Green Paper (published in January 2017).

Our approach

We describe a dynamic model for creating intangible asset-rich organisations. At the firm-level, intangible assets are produced through the joint efforts of internal and external stakeholders, including managers, employees, shareholders, and extending to suppliers, investors, customers and communities. Drawing upon the methodology used by economists in physical assets, we distinguish between a flow and a stock. Inputs of labour, investment (physical and intangible capital) and finance represent flows which are converted through activities into capital assets or stocks of physical and intangible capital. In turn, these stocks are converted through further activities into outputs or flows of sales, productivity and stock market value.

¹ Intangible Asset Reporting and Intangible Asset Charter, Big Innovation Centre, June 2017

² Department of Business, Energy and Industrial Strategy BEIS (2016) Corporate Governance Reform -Green Paper, London UK

Flows are converted into stocks, and in turn, stocks are used to create value, through human action. Two kinds of activities are needed. Firstly, activities which transform various investment flows into the stock of assets, and secondly, activities which combine different assets (tangible and intangible) to produce value. Activities to produce stocks of assets involves work – specifically: values-based and relational work, process work (human, technological and material), knowledge-creating work, and decision-making work. Activities to use stocks of assets involves combining tangible and intangible assets to create value. The generic stocks of assets are physical capital (buildings, plants and machinery, vehicles), and intangible capital (computerised information, innovative property, economic competences and socio-psychological competences). Distinctive combinations of tangible and intangible assets constitute the comparative advantage of firms.

Human interaction is of central importance to the creation of intangible value. O'Donnell et al. (2003) find that 'almost two thirds of organizational value is perceived to be intellectual and that half of this IC value is perceived to stem directly from the people dimension'. Intangible assets related to socio-psychological competences are therefore a key component of intangible asset-rich organisations capable of generating rising levels of wealth creation. Repeated cycles of production and distribution are necessary to all organisations. Stakeholders contribute inputs, produce physical and intangible assets, and share in the distribution of the value created. We argue that intangible asset-rich organisations with the potential for sustained wealth generation are characterised by high levels of relational capital, in which stakeholder activities are orchestrated to serve a shared purpose. Relational capital is generated through interactions which are judged by stakeholders to be fair. Incorporating the principle of fairness into production and distribution includes management practices of voice and participation; collective knowledge building and organisational learning; trust and good quality relationships.

Intangible asset-rich organisations are stakeholder organisations. Responsible, conscious or shared capitalism depends upon a critical presence of such organisations in the national economy. They act not only as generators of wealth and growth, and not even as exemplars of innovation and productivity, but vitally as leaders in combining financial, social and environmental purposes to mutual benefit

1. The Elements of the Firm-level Framework

Intangible assets matter – they matter for productivity, innovation and national wealth creation. Despite this, we lack a common language and conceptual framework for identifying and describing intangibles, as well as evaluating the impact they have on economic performance. We propose a firm-level framework for understanding and using intangible assets which incorporates the following elements:

Stakeholder Perspectives and Interests: The stakeholders who contribute to the production of intangibles differ in their understanding of what intangible assets are and how they are put to use by the organisation. In multi-stakeholder contexts, firm performance is related to how managers perceive stakeholder interests: 'firms tend to perform better when they see stakeholder interests as joined, or at least largely overlapping, than firms that see them as primarily conflicting' (Harrison & Wicks, 2013).

The Production of Intangibles: Producing intangible assets requires contributions and efforts from multiple stakeholders, including investors, shareholders managers, employees, suppliers, customers and communities. The joint activities of stakeholders are more likely to promote positive firm performance when their relationships are shaped by justice (as fairness), voice (as participation and control), work (as a meaningful experience of work) and trust (in others and in the organisation).

- **The Fairness Principle:** Intangible asset-rich organisations depend upon the knowledge, skill and craft of contributing stakeholders. When stakeholders judge interactions and outcomes in both production and distribution to be fair, they are more likely to contribute their efforts over repeated cycles of investment³.
- **Purpose, Work and Meaningfulness:** Effective organisations combine fairness and purpose. Intangible asset-rich organisations are more likely to be successful in mobilising human efforts to combine materials, technology and knowledge when they aim at a worthy purpose which is endorsed by the stakeholders⁴. Repeated cycles of value generation are fostered when stakeholders judge their work to be worthwhile and significant, and personally fulfilling – in other words when work is structured for meaningfulness (Yeoman, 2014)⁵.

³ Simons, T. & Roberson, Q. (2003). Why managers should care about fairness: the effects of aggregate justice perceptions on organizational outcomes. *The Journal of Applied Psychology*, 88(3), pp.432–443.

⁴ See Purposeful Company Report
(<http://www.biginnovationcentre.com/media/uploads/pdf/The%20Purposeful%20Company%20Interim%20Report.pdf>)

⁵ Yeoman, R. (2014). Conceptualising Meaningful Work as a Fundamental Human Need. *Journal of Business Ethics*.

- **Decision-making and Relationships**: Stakeholders engaged in the production and use of intangibles make decisions about combining intangibles at different levels, from the strategic to the operational. An essential aspect of the process of combining assets is collective knowledge building and organisational learning. These are interactive social processes which are dependent upon good quality relationships. This means that 'relational value' is a core intangible asset which supports the incorporation, motivation and learning of stakeholders involved in the firm as a system of social cooperation. The company's knowledge, relational and learning management system - its conscious and systematic integration of stakeholders into operational and strategic processes – is therefore central to the effective use of intangible assets.
- **Cooperation and Competition**: The production of intangibles requires high levels of social cooperation and trust between contributing stakeholders⁶. One function of competition is to stimulate learning, adaptation and dissemination of novelties in order to elevate the productive capacity of the whole ecosystem in which the firm is embedded. Indeed, in acknowledging the importance of sector-wide learning, some scholars include competitors among the firm's stakeholders.

Using Intangibles in Value Creation: Value arises from the distinctive ways in which the organisation's stakeholders combine tangible and intangible assets. A firm's comparative advantage is derived from the unique combinations of tangible and intangible assets in activities which produce innovations and productivity improvements. The interaction effects of intangibles and their relevance to value must be considered when combining assets. However, in the absence of core values such as fairness and meaningfulness, there is no guarantee that stakeholder efforts will produce the desired effects. Value may be distorted by organisational dysfunctions⁷; or simply be unrealised as a consequence of failure to manage stakeholder contributions, knowledge and learning.

Fairness in the Distribution of Value: Of equal importance to production is the distribution of value to the various stakeholders who have made their contribution to the creation and maintenance of intangible assets. Distributions which generate perceptions of fairness are more likely to motivate stakeholders to re-invest assets and efforts into subsequent cycles of production and foster a rising trajectory of wealth creation.

Intangible assets are human creations. Producing intangibles involves people combining knowledge with other intangibles and tangibles in order to build organisations with productive, value-adding capabilities. This process means that, in general terms, intangible assets are accumulations of social and technological improvements arising from the advancement and practical application of knowledge in human action. From an anthropological perspective, Basu & Waymire (2008) define intangibles as the 'ideas or knowledge about the natural

⁶ Handfield, R.B. & Bechtel, C., 2002. The role of trust and relationship structure in improving supply chain responsiveness. *Industrial Marketing Management*, 31(4), pp.367–382.

⁷ Heffernan, B (2011). *Willful Blindness: why we ignore the obvious at our peril*. Walker & Company.

(physical and biological) and socio-cultural worlds that enable people to better accomplish their goals'. The link to goals is an important insight for understanding the role of organisational purpose in bringing together the different perspectives of stakeholders and motivating their various contributions to produce intangible assets for mutual benefit.

These elements are incorporated into the following sections which propose a framework for developing and capturing intangible assets at the organisation level.

2. Stakeholders, Resources and Intangible Asset-rich Firms

From a dynamic capability perspective, Tsai et al (2012) define intangible assets as:

'Intangible assets are a firm's dynamic capability created by core competence and knowledge resources, including organization structure, employee expert skills, employment centripetal force, R&D innovation capability, customer size, recognizable brand, and market share'(Tsai et al, 2012).

Businesses combine their tangible and intangible assets in response not only to organisational and market factors but also to their beliefs about how a firm should operate. In other words, how we press intangibles into service is influenced by our underlying theory of the firm, or the set of background assumptions we hold about how the company operates. In Box 1 we present some of the theories of the firm in the context of intangible assets, and afterwards we discuss how their stakeholder approach enables value creation from intangibles.

Box 1: Theories of the Firm

Overview: Theories of the Firm in the context of intangible assets

Contractual Theories conceptualise the firm as a 'nexus of contracts' (Jensen & Meckling, 1976; Coase, 1937). This supports a shareholder-centred understanding of the firm, where businesses should be managed to serve the interests of shareholders alone. However, Boatright (2002) adapts contractual theories to a stakeholder perspective by characterising the 'nexus of contracts' as corporate constituencies where each constituency of employees, customers, suppliers, and investors 'provides some asset in return for some gain' (Boatright, 2002). Boatright argues that stakeholder theory is consistent with contract theory: 'all stakeholders are regarded as contractors with the firm, with their rights determined through bargaining'.

Transaction-costs Theories (Williamson, 1975; 1985) consider transaction costs in the optimal allocation of resources in society. In a variant of transaction-cost theory, agency theory argues that contractual arrangements optimise the utility of an individual actor; for example, the business owner. This argument assumes that the goals of the organisation and its agents are coterminous with the goals of the principal. However, the principal-agent problem arises.

Behavioural Theories (Cyert & March, 1963) open up the 'black box' of the organisation to examine how the firm behaves with respect to lower level processes of decision-making and resource allocations. Rationality is bounded; knowledge is imperfect; individuals satisfice rather than maximise; and adopt coping mechanisms in the form of rules, procedures, norms.

A theory of the firm includes an account of the nature and boundary of the firm; the internal structure of the firm; and the relations between firms and markets (Garrouste & Saussier, 2005). Boundaries, structures and relationships place opportunities and limits upon intangible asset production and use. These include: who is involved in creating intangibles (stakeholders)

and what do they need to be successful (resources). Stakeholder and resource-based theories of the firm are useful for understanding the production, use and evaluation of intangibles. Stakeholder theorists argue that corporations ought to be managed to the benefit of all stakeholders (Freeman, 1984) and as suggested by Hillman and Keim (2001) 'firm performance might be defined as the total value created by the firm through its activities, which is the sum of the utility created for each of a firm's legitimate stakeholders'. The resource-based view of the firm was set out by Edith Penrose in her *Theory of the Growth of the Firm* (1959). Firms are constrained and enabled by the resources they have at their disposal, where these resources include skills, knowledge and information, as well as plant and machinery. Drawing upon Penrose's insights and adding evolutionary economics, Nelson and Winter in *An Evolutionary Theory of Change* (1982) argue that firms are not static but are path-dependent, involving significant time and investments in building resources which are not easily tradeable.

From a resource-based perspective, organisations use internal resources and idiosyncratic processes and activities to create non-replicable intangible assets for competitive advantage (Montresor & Perani, 2014). Increasingly, and especially in systemically embedded organisations, these activities involve multiple stakeholders, internally and externally located, and demanding high levels of relational trust. The relevance of combinations of intangibles to value creation is subject to the interpretation of differently situated stakeholders. The extent and nature of stakeholder involvement in valuation influence the distribution of value, thereby setting up the motivations and incentives for further contributions to the firm's performance.

Much academic research on intangible assets has made use of the resource-based view (RBV) of the firm. However, stakeholder theorists argue that the RBV is incomplete without a stakeholder perspective (Freeman et al. 2010; Verbeke & Tung, 2013)⁸. Specifically, stakeholder theory remedies two gaps in resource-based theories of the firm: firstly – in the productive activities of the firm, resource-based views do not address how businesses create and combine assets for comparative advantage. Stakeholder theory provides insight into the network of actors contributing to the firm system, and how stakeholders can be managed to bring resources to bear upon the firm's value creation. Secondly – in the distributive activities of the company, resource-based views do not address the allocation of returns to the multiple contributors involved in the firm's value creating activities. Stakeholder theory aids our understanding of how ongoing cycles of investment and contribution to the firm's activities by stakeholders is dependent upon their receiving a fair share of the economic rents and broader value created by the firm. Similarly, the criteria for sharing of value also signal to the firm what stakeholders consider to be important, such as social and not solely financial returns.

We explore how intangible asset-rich organisation make use of a stakeholder perspective of the firm in their productive and distributive activities. In so doing, we distinguish between shareholder and stakeholder perspectives upon the firm (Table 1 below). In stakeholder perspectives people are relational and cooperative, dissent and difference are respected, and

⁸ Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B., & de Colle, S. (2010). Stakeholder theory: The state of the art. Cambridge: Cambridge University Press.

directors are integrators and communicators. This has a significant bearing upon the definition and pursuit of organisational purpose⁹. From a stakeholder perspective of the firm, organisational purpose is socially constructed from the different understandings of the stakeholders, requiring organisations to work at integrating, adjusting, conciliating and trading-off. This process goes beyond conceptualising the corporation as a transactional bargaining game, even when conducted under conditions of enlightened stakeholder management which aims at mutual gains. Rather, the corporation is conceptualised as a purposeful, multi-voiced, dispersed-power entity, where the pattern of entitlements and obligations is determined by the contributions and investments made by stakeholders when producing intangible assets. These contributions generate perceptions of what constitutes a fair return to stakeholders in the distribution of gains and motivate reinvestments in cycles of wealth creation. The associated management regime for producing intangible assets and distributing value recognises the importance of relationships for cooperation in joint activities. In describing intangible asset-rich organisations, we, therefore, integrate aspects of the resource-based view of the firm and stakeholder theory.

Table 1: Shareholder versus Stakeholder approaches

Shareholder model (unitary)	Stakeholder model (pluralist)
<ul style="list-style-type: none"> • People are rational and opportunistic • Single purpose – ‘for profit’ • Undivided ownership and control • Automatic alignment of motives and actions with goals • Enlightened shareholder model • Directors as ‘administrators of a community system’ (Berle, 1959) 	<ul style="list-style-type: none"> • People are relational and cooperative • Multiple/blended purpose – ‘for-benefit’ • Separation between ownership and control • Diversity of interests with potential for dissent and difference, as well as consensus • Multiple stakeholder model • Indistinct boundaries • Directors as integrators and communicators

⁹ The Purposeful Company Report, Big Innovation Centre, 2016

Adopting a Stakeholder Perspective of the Firm

Drawing upon Phillips (2003)¹⁰, Hillman & Keim define the legitimate stakeholders of the firm as 'those groups to whom the firm owes an obligation based on their participation in the cooperative scheme that constitutes the organization and makes it a going concern. They include customers, communities in which the firm operates, suppliers of capital, equipment, materials, and labour. Firms may have other legitimate stakeholders specific to their own situations.' (Hillman & Keim, 2001). Organisations are constituted by the relationships between those stakeholders who contribute to the activities of the business and can make a legitimate claim to a share of the value generated. Stakeholder theory is concerned therefore with 'how customers, suppliers, employees, financiers (stockholders, bondholders, banks, etc.), communities and managers interact to jointly create and trade value.' (Parmar et al., 2010). Stakeholders contribute resources, shared goals and needs, which means that organisations must not only orchestrate assets but also manage a complex social network (Verbeke & Tung, 2013). This makes stakeholder management a 'higher order capability' of the firm (Verbeke & Tung, 2013), and a source of competitive advantage when companies actively manage stakeholder relationships in order to produce and combine intangibles which are 'valuable, rare, inimitable, and non-substitutable' (ibid: 535).

'Effective stakeholder management with suppliers and customers provides firms with intangible assets such as a good reputation and high-quality relationships. These intangible assets are difficult to imitate by competing firms as no two reputations or relationships are identical. As a result, firms that have a greater capacity to access valuable resources thanks to their reputation and relationships can be expected to command a stronger competitive advantage, which yields higher financial performance and increased economic value (Fischer and Reuber 2007).'

Stakeholder theory claims that proper treatment of stakeholders in production combined with a fair return for their efforts in distribution is beneficial for firm performance and long-term value creation (Harrison & Wicks, 2013). This argument is supported by reviews of the empirical literature which find a positive connection between stakeholder management practices and firm performance (Freeman et al, 2010)¹¹. Hillman & Keim (2001: 125) argue that shareholder management leads to improved shareholder value through the creation of intangible assets, specifically they suggest that 'building better relations with primary stakeholders like employees, customers, suppliers, and communities could lead to increased shareholder wealth by helping firms develop intangible, valuable assets which can be sources of competitive advantage'. Good relationships include determining how the benefits derived from the value of the organisation are to be distributed, but stakeholders have different perspectives on what value is important and how it is allocated. Harrison & Wicks (2013) propose four factors which represent value to stakeholders; these factors are: 1) stakeholder utility associated with actual goods and services, 2) stakeholder utility associated with organisational

¹⁰ Phillips, R. A. 2003. Stakeholder theory and organizational ethics. San Francisco: Berrett-Koehler Publishers.

¹¹ Freeman, Harrison, Wicks, Parmar, and de Colle (2010)

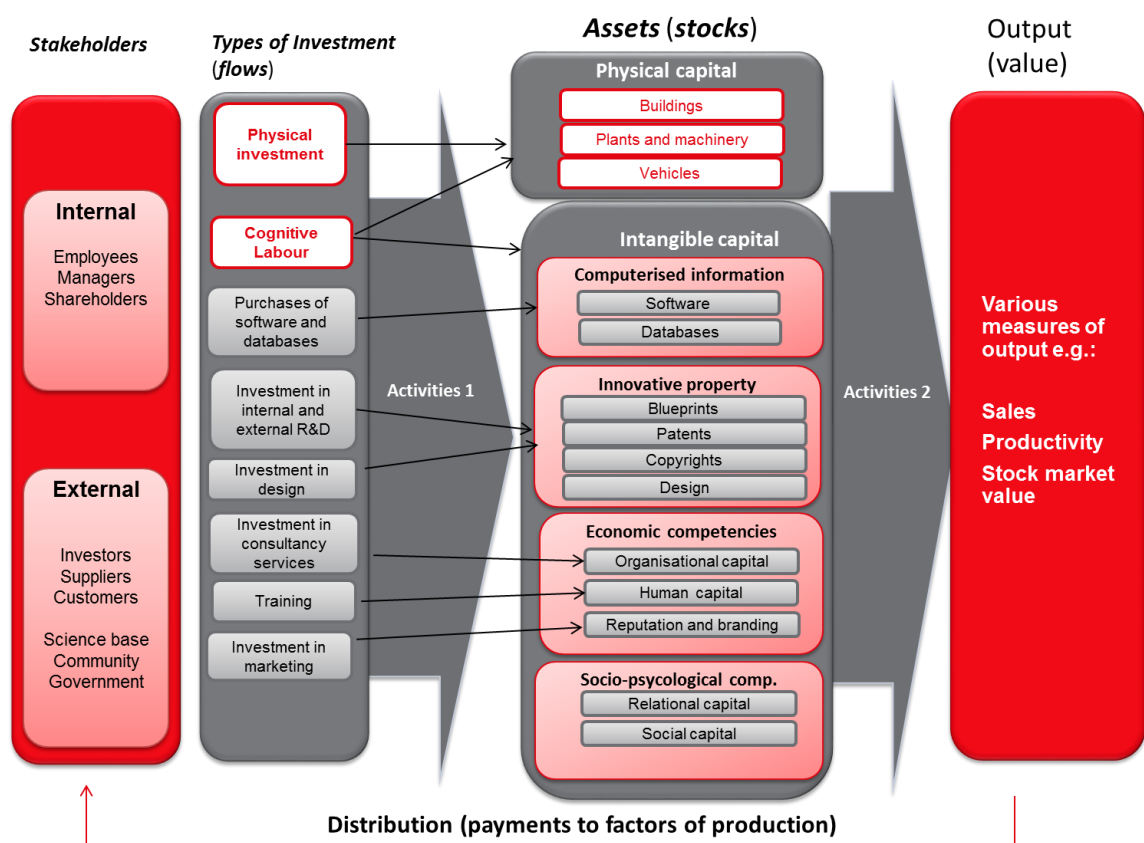
justice, 3) stakeholder utility from affiliation, and 4) stakeholder utility associated with perceived opportunity costs. Different stakeholders will value these factors more or less, depending on their position relative to firm and their assessment of the importance of the contributions they have made. The ability of stakeholders to translate their diverse interpretations of value into negotiating positions which reflect their interests and contributions will depend upon the extent to which they are integrated into the firm, and have control or influence over the corporation's activities and decision-making.

3. Towards a Framework for Intangible Assets: A Possible Approach

It should be clear why the role of internal and external stakeholders is critical in principle, but we will now explain how this works in practice, building upon best practice highlighted by various thought leaders in the corporate governance field.

An overview of the intangible assets production and value capture is shown in Figure 1 below. Below the figure, the separate parts and activities will be explained.

Figure 1: Overview of Intangible Asset Value System at the Organizational Level



3.1 Flows, Stocks and Assets

The approach we are using to document and report on intangible assets is to follow the methodology used by economists for physical assets. In the measurement of physical assets, the distinction between flows and stocks is important. The acquisition of a durable physical good, such as, for example, a PC, is considered a flow of investment in physical capital, while the stock of this specific type of capital is the sum of all the PCs acquired in the past and not scrapped or sold.

Usually, in the context of physical goods, the term ‘asset’ is reserved for the stock of capital, not the flow (investment). In the company accounts, the ‘assets’ in the balance sheets represent a stock of value (e.g. physical stock), while the income statement includes flows (expenditure: capex, depreciation, R&D expenditure).

In the context of intangibles, the term ‘asset’ is often used indifferently to indicate a flow or a stock. It is, however, more helpful to think of investment as a flow of resources and capital as a stock and distinguish between ‘intangible investment’ – that is, investment in intangible capital – and ‘intangible capital’. For instance: R&D investment is a flow of resources, used to produce innovative capital, which is the (intangible) asset.

3.2 Aggregate Physical Capital in the National Accounts

Physical capital includes tangible assets such as buildings, plant and machinery and vehicles. Statistical agencies commonly estimate two different measures of aggregate **capital stock** (see e.g. OECD 2001; Oulton 2001 and Oulton and Srinivasan, 2003)¹²:

- The **gross capital stock** of any given asset is the sum of the history of gross investment in that asset in constant prices, less the sum of losses due to accidents, scrapping and disposals.
- The **net capital stock** differs from the gross stock in that allowance is also made for depreciation. A simple way of computing the net capital stock is via the Perpetual Inventory Method (PIM), in which physical capital K this is usually constructed as cumulative investment (I) net of depreciation (δ):

$$K_t = K_{t-1}(1 - \delta) + I_t$$

¹²OECD 2001. Measuring Capital: OECD Manual: Measurement of Capital Stocks, Consumption of Fixed Capital and Capital Services. Retrieved from <http://www.oecd.org/std/na/1876369.pdf> ; Oulton N. ‘Measuring Capital services in the United Kingdom’ Bank of England, 2001, Quarterly Bulletin, available at, <http://www.bankofengland.co.uk/archive/Documents/historicpubs/qb/2001/qb0103.pdf> Oulton, N & Srinivasan, H 2003, ‘Capital Stocks, Capital Services and Depreciation: an integrated framework’, *Bank of England*. Available at from <http://www.bankofengland.co.uk/archive/Documents/historicpubs/workingpapers/2003/wp192.pdf>;

Both the gross stock and the net stock are measures of wealth; the net stock, in particular, is a concept appropriate to use in a company's balance sheet. Economic theory, however, suggests that the wealth concept of capital is not the appropriate for analysing productivity and that a measure of aggregate **capital services** is needed instead (see Jorgenson and Griliches, 1967 and Oulton and Srinivasan, 2003)¹³.

Therefore a third concept of aggregate capital, sometimes called the volume index of capital services (VICS), measures the flow of capital services derived from all the capital assets, of all types and all ages, that exist in a sector or the whole economy. This is a flow, rather than a stock, concept.

The main difference between the volume index of capital services (VICS) and wealth measures of capital is the way in which different types and ages of assets are aggregated together. In the volume index of capital services (VICS), each item of capital is weighted by its rental price. The rental price is the (usually notional) price that the user would have to pay to hire the asset for a period. By contrast, in wealth measures of the capital stock each item is weighted by the asset price i.e. the price at which it could be sold to another user.

Giorgio Marrano et al. (2009)¹⁴ describe how the capital services approach can be similarly applied when estimating intangible capital at the aggregate country or industry level. See Box 2 for an overview of the definitions.

¹³ Jorgenson, D. W. and Griliches, Z., 'The Explanation of Productivity Change,' *Review of Economic Studies*, 34(3) 1967, 249-83.

¹⁴ Mauro Giorgio Marrano & Jonathan Haskel & Gavin Wallis, 2009. 'What Happened To The Knowledge Economy? Ict, Intangible Investment, And Britain'S Productivity Record Revisited,' [Review of Income and Wealth](#), International Association for Research in Income and Wealth, vol. 55(3), pages 686-716, 09.

Box 2: Investment, Capital Stocks and Capital Services

Investment, Capital Stocks and Capital Services

Investment is the term given to expenditure by firms and government on capital assets which contribute to their production process or operations for a sustained period: that is, assets which are not consumed entirely in the current period. The long-lived nature of these assets – known as capital assets – distinguishes them from other goods which are used up in the current period – known as intermediate consumption. Conventional examples include buildings, machinery & equipment and transport equipment. As such, investment is a flow of resources devoted by firms (for example) to increasing the quantity of capital assets available for production.

In the National Accounts, investment is expressed in net terms: that is, expenditure by firms on new capital assets (acquisitions) less sales of capital assets (disposals). As such, this form of investment – also known as Gross Fixed Capital Formation – is a net concept, and is a component of the expenditure measure of Gross Domestic Product.

The **capital stock** is the term given to an accumulation of capital assets which are available for use. As its name suggests, this is a stock measure. The gross capital stock is the value of capital assets currently deployed in use valued on an 'as new' basis; the net capital stock is the current value of capital assets currently deployed in use, less the impact of depreciation. For example, the gross capital stock of a firm reflects the value of accumulated machinery and equipment, buildings and other assets available for firm production: the amount it would cost to replace these items with new equivalents. The net capital stock reflects the value the firm could expect to receive for these same assets if they were sold in current market conditions: the difference between these values reflects depreciation through wear and tear and technical obsolescence.

In accounting terms, net investment in a period will act to raise both measures of the capital stock, as new machinery or buildings add to the stock of capital assets. The retirement of assets – what happens when a capital asset reaches the end of its working life – will act to reduce both measures of the capital stock each period, while depreciation affects only the net capital stock.

Estimates of the size of the capital stock depend on a range of different data sources and assumptions, variation in which can generate quite different estimates. In particular, assumptions are required about the life-length of an asset (how long it remains in productive use) and the age-price profile of an asset (the change in the price of an asset over the course of its lifetime). These assumptions – informed by survey data – can have a particularly large impact on estimates of the capital stock.

Estimates of **capital services** capture the value of the input to production provided by the net capital stock, and are the preferred measure of capital input for multi-factor productivity analysis. For a firm, capital services reflect the value that their accumulated stock of buildings, machinery and equipment generates in a given period. As such it is a flow measure: just as net investment represents the gross flow of resources to the capital stock in a period, capital services capture the value to a firm of holding a given net capital stock during a period.

The difference between the capital stock and capital services can be thought of as the distinction between the purchase value of an asset and the cost of renting an equivalent asset for a single period.

The former concept provides an estimate of the value of acquiring an asset for use in this and all future periods; the latter provides an estimate of the value of acquiring an asset for use only in this period. Under a number of assumptions about the rental market, the costs of rental reflect the value which accrues to the renter in a given period, and therefore the contribution of that asset to the productive process.

Company balance sheets measure the values of stocks and are compiled at the beginning and end of the accounting period. The basic accounting identity links the opening balance sheet and the closing balance sheet:¹⁵

- *The value of the net stock of a specific type of asset in the opening balance sheet*
- **Plus** *the total value of the assets acquired, less the total value of those disposed of*
- **Minus** *consumption of fixed capital (depreciation)*
- *Is identical to the value of the **net stock** of the asset in the closing balance sheet.*

This is equivalent to the Perpetual Inventory Method (PIM) method mentioned above and brings it into line with statutory accounting reporting as discussed in an another Intangible Gold project report on Intangible Asset Reporting¹⁶.

¹⁵ Meinen, G, Verbiest P, & de Wolf, P 1998, 'Perpetual Inventory Method: Service lives, Discard patterns and Depreciation methos', Statistics Netherlands, Department of National Accounts, July, 1998, <https://www.oecd.org/std/na/2552337.pdf>

¹⁶ Intangible Gold project: 'Intangible Asset Reporting, Defining Britain's Real Treasures', Big Innovation Centre, June 2017.

3.3 The Intangible Asset Value System Framework and its Activities and Broad Components

In this framework, we aim to make more explicit the distinction between flow of investments (either tangible or intangible) and the stock of assets they contribute to create.

We define 'intangible investment' the flow of resources in which the company invests to produce (a stock of) 'intangible capital'.

Figure 2: Framework for Intangible Asset Capture at the Organisational Level

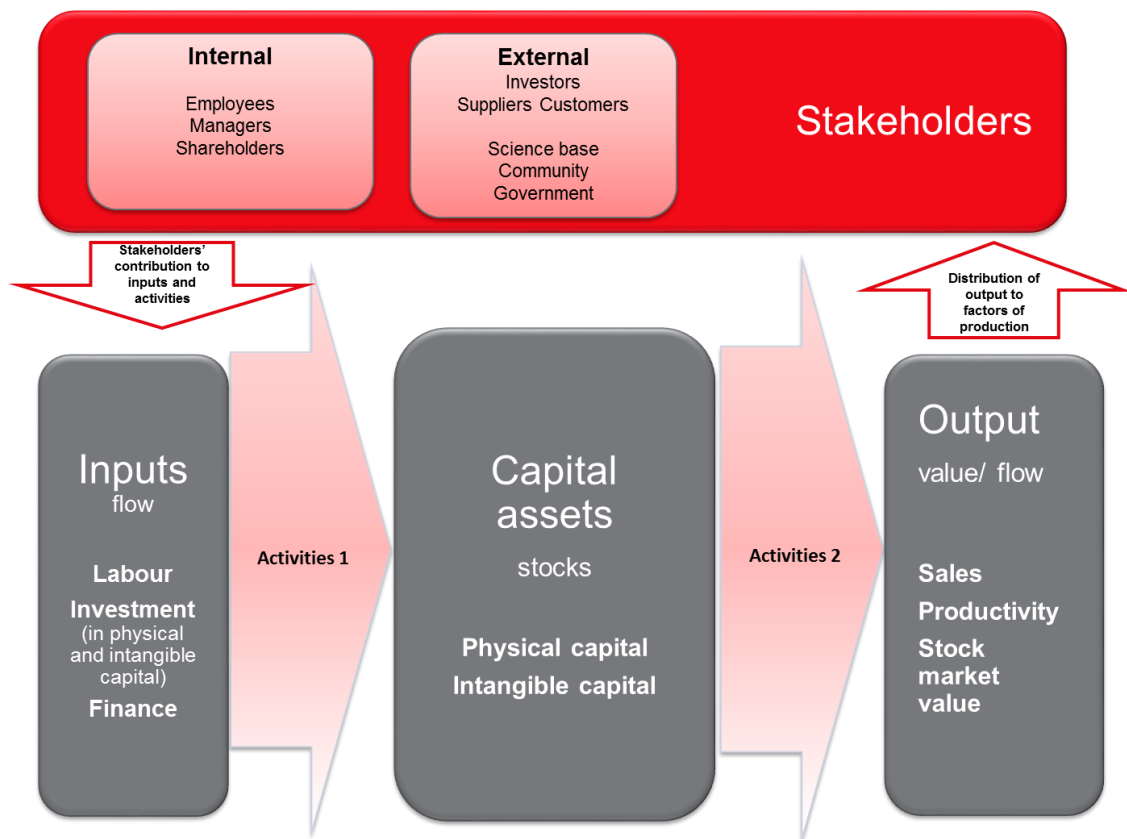


Figure 2 provides a possible representation of the different elements of the intangibles framework. The company invests in a flow of resources (inputs) which are combined to create different types of tangible and intangible assets through a certain type of activities (activities 1). The different assets are then used together (possibly with additional inputs) to create value for the firm (activities 2).

The company stakeholders are a key component in contributing to the inputs such as labour (employees, managers) or finance (investors, shareholders).

In the diagram, we call **Activities 1** the kind of activities necessary to transform various investment flows into the (stock of) assets.

Assets are intermediate elements of the production process. They are *durable* elements, in the sense that they provide value over a period longer than one year. They can be considered different types of capital stock, both tangible and intangible. This broader concept of capital is not new: Haldane (2015)¹⁷, for example, includes among the inputs of production intellectual – or knowledge – capital (ideas and technology) and social capital (cooperation and trust) as well as the more traditional inputs physical capital (plants, machinery, buildings, vehicles) and human capital (skills and expertise). There are also forms of capital that are external to the company: e.g. *infrastructural* capital (transport networks and legal systems). Sachs (2014)¹⁸ also adds *environmental* (or *natural*) capital (water, land and ecosystems) which marry with the Integrated Reporting's Six Capitals reviewed in an Intangible Gold project report on Intangible Asset Reporting¹⁹.

Finally, **Activities 2** in this framework refer to the combination of different assets (tangible and intangible) through human action to produce value.

Table 2: Activities1 Production and Activities 2 Use

Activities One – PRODUCTION (production and maintenance of Intangible Assets)	Activities Two – USE (combining tangibles and intangible to produce value added)
<u>Processes</u> (human-technology-material) <u>Interactions and Relational Work</u> (values-based: – fairness) <u>Collaborative Knowledge Building</u> (different types of knowing-in-action: – craft, epistemic, professional and virtual) <u>Decision-making</u> (multi-level; multi-stakeholder)	Learning Judging Experimenting Evaluating Disseminating Networking Innovating Changing Adapting

Organisations must manage intangibles. However, a general model for how this may be achieved is lacking (Kaufmann and Schneider, 2004). To help make progress, we take a human capital perspective of the firm to identify key elements of intangible asset-rich organisations. Human capital is considered by many scholars to be the fundamental

¹⁷Haldane, A 2015, 'Growing, Fast and Slow', Bank of England, 15 February,

<http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech797.pdf> -

¹⁸ Sachs, J 2014, 'Sustainable Development Economics', Project Syndicate, 25 November, <https://www.project-syndicate.org/commentary/promote-sustainable-development-economics-by-jeffrey-d-sachs-2014-11>

¹⁹ Intangible Gold project: 'Intangible Asset Reporting, Defining Britain's Real Treasures, Big Innovation Centre, June 2017.

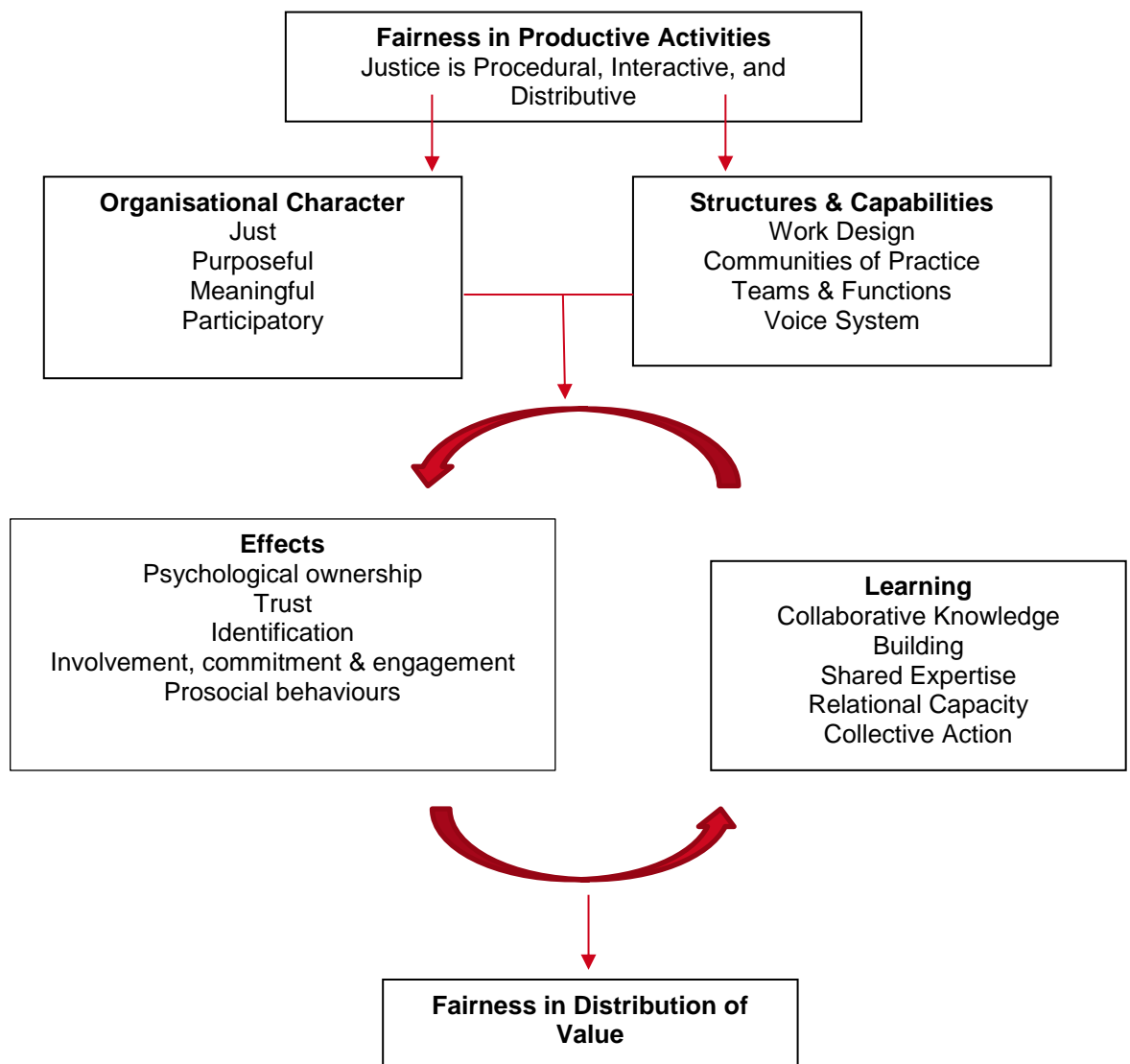
intangible. We take insights from the human capital and organisational behaviour literature to outline the characteristics of human activities needed to establish repeated cycles of reinvestment for long-term sustainable performance. Activities are of two types: firstly, transforming investment flows into assets and secondly, combining assets (tangible and intangible) into value.

Both type one and type two activities involve work. Ilmakunnas & Piekkola (2013) identify three kinds of work that create intangible capital – organisational activity; information and communication work. They argue that ‘intangible capital is linked to employees who are engaged in long-term planning, which refers to organizational capital (OC), R&D, and information and communicational technology (ICT) work’ (ibid: 44)²⁰. To these can be added relational work, which is implicated in all three kinds of work involved in intangible asset production. Edwards (2012) identifies the tools needed for relational work in contexts characterised by complexity, specialist knowledge, inter-organisational and inter-individual collaboration (Edwards, 2012: 23). These tools are relational expertise, common knowledge and relational agency.

- **Relational expertise** arising out of mutual recognition of ‘what engrosses others, taking their standpoint and mutuality aligning motives so that engagement continues’ (ibid; Edwards 2010; 2011).
- This sympathetic understanding and appreciation of other stakeholders facilitate the co-production of **common knowledge** which is a ‘resource for mobilising knowledge across practice boundaries’ (cf. Carlile, 2004).
- **Relational agency** mobilises common knowledge in order to ‘represent the differences and dependences now of consequence and the ability of actors involved to use it’ (Edwards, 2012: 26).

²⁰ Ilmakunnas, P. & Piekkola, H., 2013. Intangible investment in people and productivity. *Journal of Productivity Analysis*, 41(3), pp.443–456.

Figure 3: The Fairness Principle in Distribution:



Fairness is concerned with how we interact with one another. By invoking fairness, we are making some statement about how people ought to be treated in comparison to how they are actually treated. In the stakeholder theory of the firm, Phillips (1997) derives stakeholder fairness from the Principle of Fair Play:

‘Whenever persons or groups of persons voluntarily accept the benefits of a mutually beneficial scheme of cooperation requiring sacrifice or contribution on the parts of the participants and there exists the possibility of free-riding, obligations of fairness are created among the participants in the cooperative scheme in proportion to the benefits accepted’ (Phillips, 1997)

In other words, it is not fair to gain from the efforts of others whilst making no contribution of one’s own. To do so in organisations is to lower trust, squander social capital and diminish

the prospects for long-term sustainable performance. Cupit (2011) traces the links between fairness and social order. Social arrangements may be judged to be orderly, and therefore fair, when allocations are 'in accordance with what is due' (ibid: 399), and subject to allocative procedures which are guided by the correct reasons of impartiality and efficiency according to some publicly recognised feature of the recipient such as need or desert. Such publicly recognised features ground our entitlement to make legitimate claims. The satisfaction of claims is dependent upon a number of factors including: the validity of the claim, the claims of others and the process for judging between different kinds of claims. When claims are settled in a manner which is judged to be legitimate and even-handed, then mutual assurance of non-arbitrary and fair treatment (James, 2013) underpins the belief that others will act in reliable and predictable ways. This security is vital for mitigating the risks associated with contributing to production, increasing trust and reducing stakeholder anxiety that they will be exploited, or will fail to secure a fair return from joining their efforts to those of others.

Empirical studies of fairness principles in human action indicate that individuals often favour collections of fairness principles, prioritising or combining them according to their circumstances. In a study of fairness trade-offs, Ordonez and Mellers (1993) examine responses to: firstly, what people would favour in the 'more fair' society and secondly, what they would favour in the society in which they would 'prefer to live'. They found that 'people value equity but prefer to live in societies that sacrifice some equity in order to provide for higher minimum and mean earnings' (Konow, 2003: 1234). In a review of studies of fairness preferences, Konow (2003) concludes:

'The implication of these studies is that equity (i.e., justice in the specific sense) guides but does not monopolize distributive preferences: people care about equity, but the allocations they prefer for themselves and consider right are also influenced by concerns for efficiency and need.' (ibid: 1235)

Konow (2003) goes on to propose a 'multicriterion theory of justice' in which 'three justice principles are interpreted, weighed and applied in a manner which depends upon the context' (ibid: 1235). Anand (2001) find that people view as more fair processes which allow greater participation, freedom and information.²¹ This suggests that the role played by fairness in collective action is part of an interactive social process. The need for actors to collectively determine what fairness means, as well as how fairness principles are to be identified, weighted and prioritised against other moral concerns, leads James (2013) to propose that fairness is a social practice, and a core component of any scheme of 'mutual assurance'. In next section we will examine the importance of fairness perceptions, arising from empirical studies of procedural, interactive and procedural justice, in the productive and distributive activities of the organisation.

²¹ In weighing moral considerations, Frey & Stutzer (2001) argue that fairness as justice is not our sole concern, but that behaviour and preferences may be motivated also by altruism, responsibility, friendship, self-interest or other moral considerations.

3.4 Intangible Capital Creation: Innovative Property

Innovation has long been recognised in economics as one of the main drivers of economic growth and prosperity (for a summary see e.g. Acemoglu, 2009).

For this reason, the innovation activities that lead to the creation of innovation capital within the firm is one of most analysed types of intangible asset creation.

Innovation is often related to Research and Development (R&D) activities, although it is not limited to formal R&D. Like many other intangible assets, innovation capital can be produced internally or acquired from another company. For internal innovation activities, the inputs include the cognitive labour of scientists and engineers as well as research managers, the company's internal stakeholders. Inputs also include the use of research labs, equipment and materials. A number of companies collaborate with external scientific institutions on R&D thus external stakeholders like scientific institutions are involved. A model of 'Open innovation' has also spread widely in the recent decades (ref.), which involves collaboration with both the company suppliers and customers.

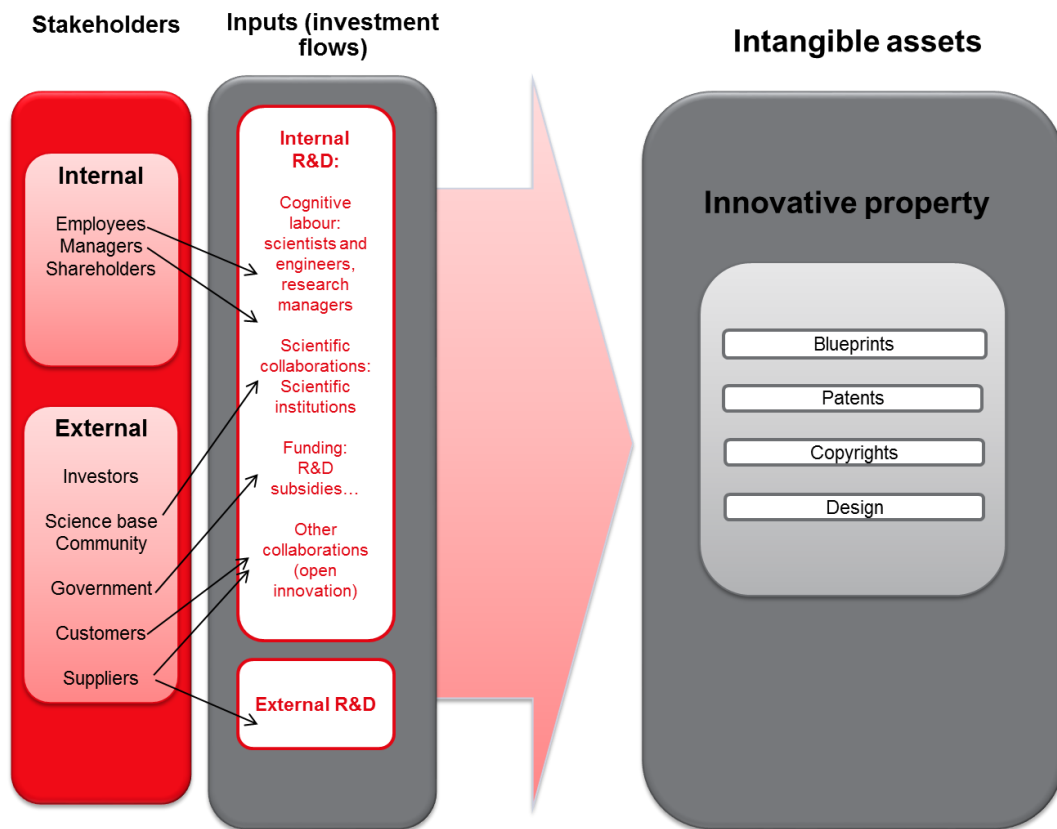
Other external stakeholders involved are the company's private investors and also the government for those companies receiving public R&D support (e.g. R&D tax credits).

The output of innovative activities can take many forms, typically new products or new productive processes. The widely-adopted of the OSLO manual (OECD 2005) definition is somewhat broader:

'An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.'

These innovation outputs can be incorporated in a blueprint or design or result in intellectual property rights such as patents, copyrights and trademarks.

Figure 4: Building Innovation Capital



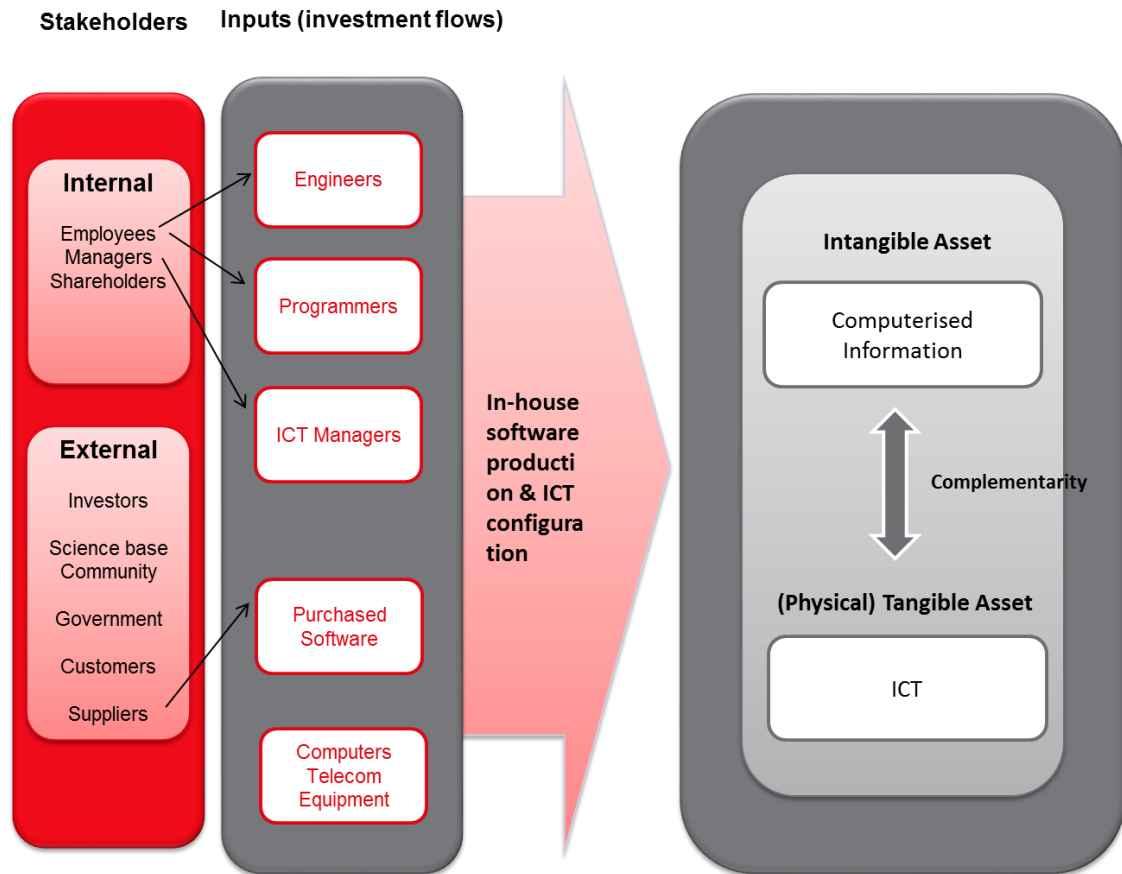
- **Computerised Information and their Role in ICT Systems:**

Intangible investment in computerised information includes software and databases (see Goodridge et al., 2014). Computer software can be either purchased from an external supplier or produced in-house by software engineers ('own-account' software). The fraction of time these employees spend on creating new software (as opposed to routine maintenance) can be used to estimate the investment in own-account software.

The class of intangibles defined as computerised information presents strong complementarities with physical ICT capital. Physical ICT equipment includes computers (PCs, laptop, terminals) and peripheral equipment (keyboard, mouse, scanner, printer) as well as telecommunication equipment (fixed line or cellular phones, and 'any apparatus for the transmission or reception of voice, images or other data, in a wired or wireless network such as a local or wide area network' (OECD, 2011). ICT equipment would be almost worthless without complementary investment in software: this includes operating systems, network software and application software.

Similarly, intangible investment in databases requires physical ICT support, as well as complementary (intangible) investment in 'database management' software.

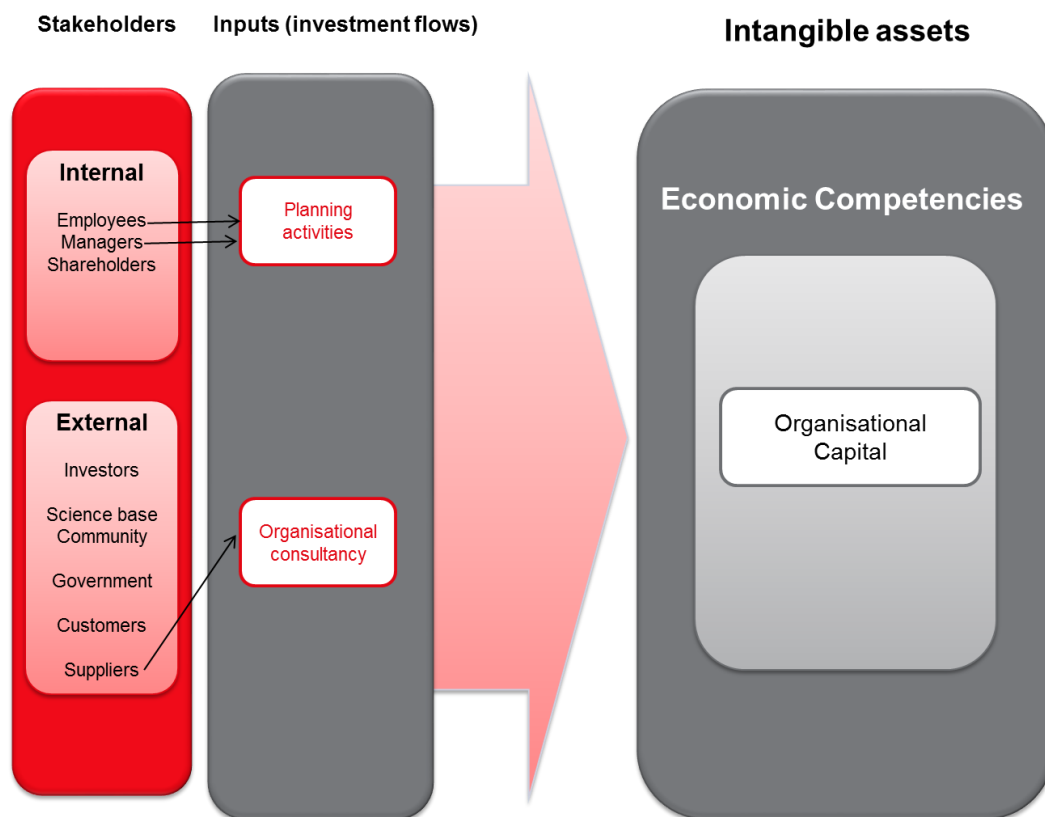
Figure 5: Computerised information and ICT



- **Organisational Capital**

Organisational capital is the set of all the business processes within the firm. These can be acquired externally, for example through consultancy services or created in-house. Own-account organisational capital is created through the activities of managers and employees: in this case, they can be estimated by the fraction of time devoted by workers to these activities.

Figure 6: Organisational Capital



Organisational capital creation is dependent upon good relationships. From the organisational behaviour literature, justice and voice promote interactions which are positively oriented towards incorporating the efforts of all stakeholders under a shared purpose. The purpose of an organisation is a social achievement, secured through interactive processes of purposing and involving stakeholders' collective judgements upon the value of the organisation's reason for being (Yeoman, 2016). A socially, environmentally and financially valuable purpose is jointly created and endorsed by stakeholders when organisations encourage them to become involved in connecting positive values to local and organisational concerns and challenges.

- **Justice**

Organisational justice is understood along three dimensions – procedural, distributive and interactive. Procedural fairness is concerned with fairness in the production process, including voice in decision-making; distributive fairness is concerned with fairness in the distribution of value created by the joint efforts of the stakeholders. Chi and Han (2008) define distributive justice as ‘the perceived fairness of the organizational allocation of resources’. They also define procedural justice as ‘the perceived fairness of the procedure used to make decisions’, where ‘employees perceive aspects related to procedural justice when they experience opportunities to influence decisions, to express their voices, or to possess accurate information used for making decisions’.

With respect to distributive justice, people are satisfied when they perceive the benefits and burdens of production to have been divided fairly, even if this involves giving up resources and accepting less (Tyler & Blader, 2003: 350). Procedural justice has both a decision-making and a value-expressive function. The ‘value-expressive worth’ of procedural justice lies in the interactional dimensions of being treated with politeness and dignity by those in positions of authority which, in turn, stimulates commitment and cooperation (ibid: 351). This intersubjective dimension of procedural justice is valued by people, independent of whether they have an influence over decision-making. People rely upon positive relationships to provide the respect and esteem recognition out of which they construct positive self-identities: ‘the central reason that people engage themselves in groups is because they use the feedback they receive from these groups to create and maintain their identities’ (ibid: 353). Identity security is a vital human need which Tyler and Blader say ‘prevails over resource models in predicting engagement and cooperation’ (ibid: 354), except possibly in cases of severe material deprivation. Group relationships are a source of identity information related to one’s worth and the value of one’s contributions. Further, group judgements upon the robustness of procedures (with respect to being generators of fairness) provide participants with confidence that signals of their worth and value are accurate. This provides the individual with strong motivations to become a cooperative member of a group, and to identify with that group through a sense of psychological ownership.

Table 3: Organisational Justice

Justice Definition	
Organisational justice perceptions arise from judgements upon how fairly employees and other stakeholders are treated. Core elements of organisational justice are distributive, procedural and interactive (Cohen-Charash and Spector, 2001)	
Behavioural Effects	Performance Effects
Workplace justice is instrumental in the development of positive exchange relationships (trust, commitment, perceived support, leader-member exchange) (Karriker and Williams, 2007) ²²	Distributive justice most strongly linked to unit-level performance, such as productivity and customer satisfaction; interactive justice most strongly related to unit-level processes, such as citizenship behaviour and cohesion (Whitman et al, 2012)
All three components of justice strongly predict trust – statistical associations as high as .60 (Colquitt et al, 2001) ²³	Fair treatment of employees, examined through the aggregation of justice perceptions at the departmental and organisational levels, fosters employee commitment to the organisation and its goals, leading to improved employee retention, customer service and organisational performance (Simons and Roberson, 2003)
Positive justice perceptions foster organisational citizenship (helping and cooperative behaviours, prosocial orientations, participation and effort) (Podsakoff et al, 2000) ²⁴	Employees who perceive interpersonal injustice are more likely to engage in workplace deviance (Holtz & Harold, 2010); employees with positive procedural justice perceptions are more highly engaged and exhibit lower intentions to leave (Inoue et al, 2012; Malinen et al, 2013).
Employee justice perceptions are related to treatment of self and others, including the dignity and respect accorded to external stakeholders (Rupp, 2011) ²⁵ .	
Organisational justice perceptions mediate employees' perceptions of high commitment work systems (moderated by trust) (Farndale et al., 2010)	

²² Karriker, J.H. & Williams, M.L. (2007). Organizational Justice and Organizational Citizenship Behavior: A Mediated Multifoci Model. *Journal of Management*, 35(1), 112–135.

²³ Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., & Ng, K. Y. (2001). Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86, 425–445.

²⁴ Podsakoff, P.M., Mackenzie, S. B.; Paine, J. B.; Bachrach, D. G., (2000). Organizational Citizenship Behaviors : A Critical Review of the Theoretical and Empirical Literature and Suggestions for Future Research. *Journal of Management*. 26, 3, 513-563.

²⁵ Rupp, D. E. (2011). An employee-centered model of organizational justice and social responsibility. *Organizational Psychology Review*, 1(1), 72–94.

- **Voice**

The degree of joint stakeholder control over their involvement in, and contribution to, the productive activities of the intangible asset-rich organisation can be assessed by the extent to which stakeholders have a voice in joint decision-making and collective action. The importance of voice can be expressed in both intrinsic and instrumental terms. Intrinsically, stakeholder voice is part of a long tradition of industrial democracy and economic citizenship in which having a share in decision-making is a right owed to all workers; instrumentally, stakeholder voice makes good business sense because it enables managers to tap into workers' tacit knowledge and to reconcile conflict and differences for mutual benefit. What voice means and how it is enacted in organisations is subject to considerable interpretation and variation. Hirschman (1970) describes voice as 'any attempt at all to change rather than to escape from an objectionable state of affairs'. Lavelle et al. (2010) define voice as 'any type of mechanism, structure or practice which provides employees with an opportunity to express an opinion or participate in decision-making within their organisation'.

An enduring voice system requires multiple channels for voice to be expressed which combines direct individual participation, such as team meetings and strategy days, with indirect collective representation, such as employee representatives on the board and a strong union presence (Pyman et al., 2006). Wegge et al (2010) identify the importance of 'structurally anchored organisational democracy' including 'broad-based and institutionalised employee influence processes that are not adhoc or occasional in nature' (ibid: 162). For the purposes of creating intangible asset-rich organisations, voice goes beyond having a say, since having a say does not automatically imply joint control. For example, Heller (2003) distinguishes between having a share in participation (as taking part in an activity) and having a share in power (as having a degree of influence over an activity). If voice means having a share of power, then voice is not realised by a purely structural or procedural approach. Simply setting up structures will not guarantee that each stakeholder will experience voice as joint control because many voice systems have 'deaf ears' (Harlos, 2001). Having a voice is the social and interactive experience of being listened to by others, and being treated as an equally worthy person with an equally valid point of view.

Table 4: Voice

Voice Definition	
Voice as extra-role or discretionary behaviour leading to suggestions for improvement for oneself or others (Grant & Ashford, 2008; Parker, Williams, & Turner, 2006) ²⁶	
'Discretionary communication of ideas, suggestions, concerns, or opinions about work-related issues with the intent to improve organizational or unit functioning (Morrison, 2011) ²⁷	
Voice is 'the ability to have meaningful input into decisions' (Budd 2004: 23) ²⁸ .	
Behavioural Effects	Performance Effects
Participation programmes which increase voice lead to positive fairness perceptions (Konovsky, 2000)	Voice (or silence) is linked to failures to convey information and knowledge crucial to organisational performance, leading to high levels of risk, and even catastrophic failure (Milliken et al., 2003; Pinder & Harlos, 2001) ²⁹
Fostering a voice climate positively effects the willingness of employees to contribute ideas and make suggestions for improvement (Morrison et al., 2011)	
Voice promotes pro-social behaviours (Brief & Motowidlo, 1986)	Voice supports voluntary contributions of ideas and information needed for organisational learning and improvement (Detert & Burris, 2007; Dutton & Ashford, 1993; Tangirala & Ramanujam, 2008b).
Voice is an element of procedural justice (Bies & Shapiro, 1988; Tyler et al., 1985)	
Voice systems combining direct and representative mechanisms are more effective for eliciting managerial responsiveness, having job control and an influence over job rewards (Pyman et al., 2006)	Voice facilitates the implementation of new organisational practices (Edmondson, 2003)

○ **Human capital**

Human capital is a measure of the economic value of an employee's skill set. The concept of human capital recognises that not all labour is equal and that the quality of employees can be improved by investing in them; the education, experience and abilities of employees have economic value for employers and the economy as a whole. The standard approach in labour economics views human capital as a set of skills and characteristics that increase a worker's

²⁶ Grant, A.M., & Ashford, S.J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, 28, 3–34.

²⁷ Morrison, E.W. (2011). Employee voice behavior: integration and directions for future research. *Academy of Management Annals*, 5, 373–412

²⁸ Budd, J. (2004). *Employment with a Human Face: Balancing Efficiency, Equity and Voice*. Ithaca, NY, Cornell University Press.

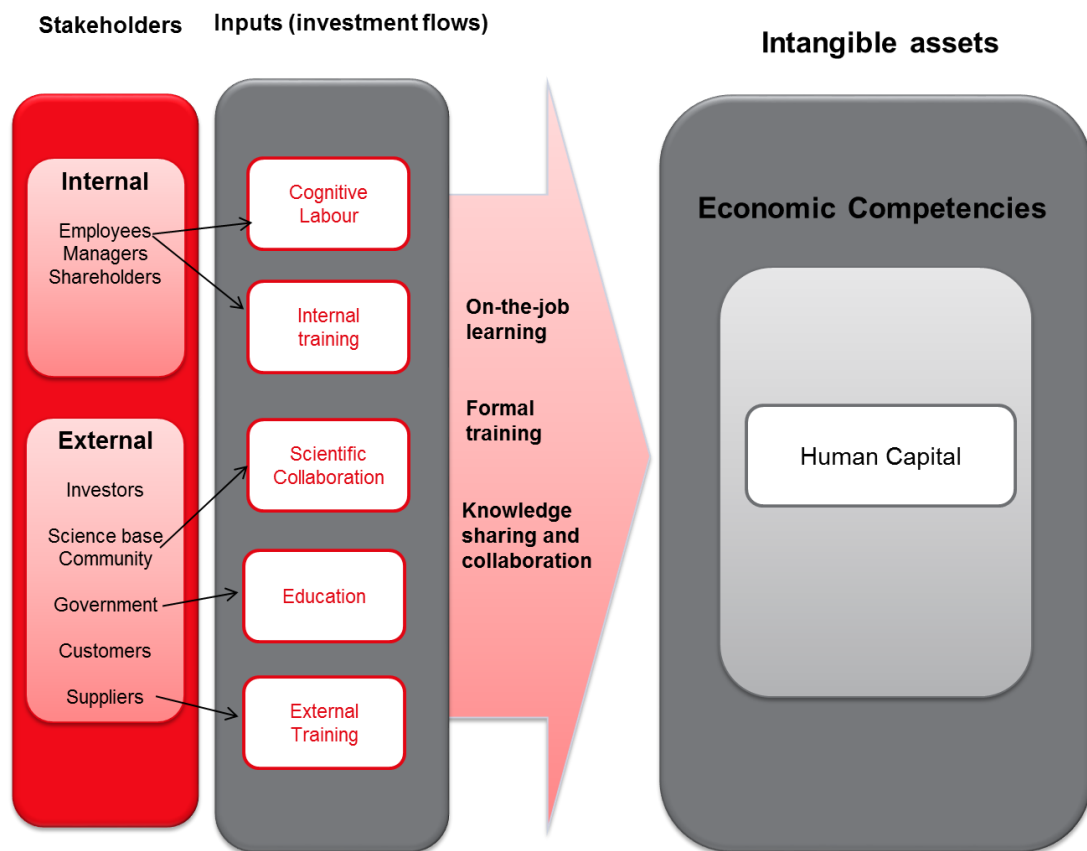
²⁹ Milliken, F.J., Morrison, E.W. and Hewlin, P.F. (2003). An exploratory study of employee silence: issues that employees don't communicate upward and why. *Journal of Management Studies*, 40, 1453–1476

productivity (Becker, 1964). Possible sources of human capital differences include innate ability, schooling, school quality and non-schooling investment, training.

Training is the component of human capital that workers acquire after schooling, often associated with some set of skills useful for a particular industry or useful with a particular set of technologies. It is difficult for a worker to make training investments by himself and therefore it is the company who tends to invest in the training of the workers, and often ends up bearing a large fraction of the costs of these training investments. Training has a significant ‘matching’ component in the sense that it is most useful for the worker to invest in a set of specific technologies that the firm will be using in the future. So training is often a joint investment by firms and workers.

Human capital is also acquired through on-the-job learning and informal knowledge sharing.

Figure 7: Human Capital



- **Work**

The organisation of work links together organisational capital and human capital. Meaningful work and voice are the two key drivers of employee engagement. Work design plays a role in a sense of personal value and positive identity formation via an experience of work being meaningful and worthwhile. In their meta-review of the work design literature, Humphrey et al. (2007) find that 'experienced meaningfulness is the best mediator of the relationships between motivational characteristics and work outcomes' where 'three motivational characteristics (skill variety, task identity, and task significance) have been hypothesized to impact work outcomes through experienced meaningfulness (Hackman and Oldham, 1976)' (ibid: 1346). The same kind of work can be designed to produce different outcomes. For example, Salzinger (1991) describes how in one cooperative of domestic services the work was defined as low-skilled and temporary, resulting in no training for staff. In a second cooperative, the work was organised in professional teams which offered training and participation in decisions: 'The result was that members of the first co-op came to regard domestic work as unimportant, whereas members of the second regarded it as an inherently skilled occupation, deserving of respect, fair treatment and decent pay' (Ashforth and Kreiner, 1999: 431) .

Furthermore, improved organisational outcomes can be achieved at the expense of employees when work design intensifies work by increasing workers' responsibility for getting work done, without increasing their autonomy as discretionary control over how to get the work done. For instance, the European Working Conditions Survey (EWCS) 2000-2001 showed that whilst team workers reported experiences of an increased social learning environment, and more task complexity, they also reported 'increased pace of work and having to work to tight deadlines, and indicate that their health is affected by work'. In other words, workers experienced increased levels of responsibility without a corresponding increase in their control capacity – specifically, without an increase in their ability to participate in the decision-making necessary for getting the work done. As a consequence, they suffer from diminished self-efficacy, characterised by reduced confidence in their capabilities; lowered trust that they will be supported by colleagues and the wider organisation if things go wrong; inability to influence the rules governing co-operation and decision-making; and reduced capacity to recruit the involvement of others in their work activities.

Table 5: Meaningful Work Definitions

Meaningful Work Definitions	
<p>'Psychological meaningfulness can be seen as a feeling that one is receiving a return on investments of one's self in a currency of physical, cognitive, or emotional energy. People experienced such meaningfulness when they felt worthwhile, useful, and valuable—as though they made a difference and were not taken for granted. They felt able to give to others and to the work itself in their roles and also able to receive.' (Kahn, 1990: 704)³⁰</p> <p>Meaningful work is emotionally attractive work which is judged to be independently valuable, where work is structured by the goods of autonomy, freedom and dignity. (see Yeoman, 2014)³¹</p>	
<p>Meaningful and valued work, together with other factors such as justice and fairness perceptions, choice and control, influence job engagement (Maslach et al., 2001; May et al, 2004)³²</p> <p>Meaningful work is positively associated with a number of work-related features including engagement (Geldenhuys, Taba & Venter, 2014)³³; job satisfaction (Duffy et al., 2013), organisational commitment (Leiter & Harvie, 1997)³⁴</p> <p>The experience of meaningfulness in work is related to autonomy and control (Yeoman, 2014; see Gallie, 2007)³⁵. Harms of non-meaningful work related to health and well-being outcomes (Bambra, 2007)³⁶</p>	<p>Employees' search for meaning at work is linked to retention, absenteeism, engagement, and hence to organisational performance (Holbeche and Springett, 2003; Soane et al, 2013)³⁷.</p> <p>At an organisational level, meaningful work is positively associated with learning focused environments (Pavlish and Hunt, 2013)³⁸</p>

³⁰ Kahn, W. A. 1990. Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33: 692-724.

³¹ Yeoman, R. 2014. Conceptualising meaningful work as a fundamental human need. *Journal of Business Ethics*, 125: 235-251.

³² May, D. R., Gilson, R. L., & Harter, L. M. 2004. The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77: 11-37

³³ Geldenhuys, M., Taba, K., & Venter, C. M. 2014. Meaningful work, work engagement and organisational commitment. *SA Journal of Industrial Psychology*, 40(1)

³⁴ Leiter, M. P., & Harvie, P. 1997. Correspondence of supervisor and subordinate during major organizational change. *Journal of Occupational Health Psychology*, 2: 343-352

³⁵ Gallie, D. (2007). *Employment Regimes and the Quality of Work*, Oxford: Oxford University Press

³⁶ Bambra, C., Egan, M., Thomas, S., Petticrew, M. & Whitehead, M. (2007). The psychosocial and health effects of workplace reorganisation. 2. A systematic review of task restructuring interventions. *J. Epidemiol. Community Health* 61, 1028-37.

³⁷ Soane, E., Shantz, A., Alfes, K., Truss, K., Rees, C., & Gatenby, M. 2013. The association of meaningfulness, well-being and engagement with absenteeism: A moderated mediation model. *Human Resource Management*, 52: 441-456

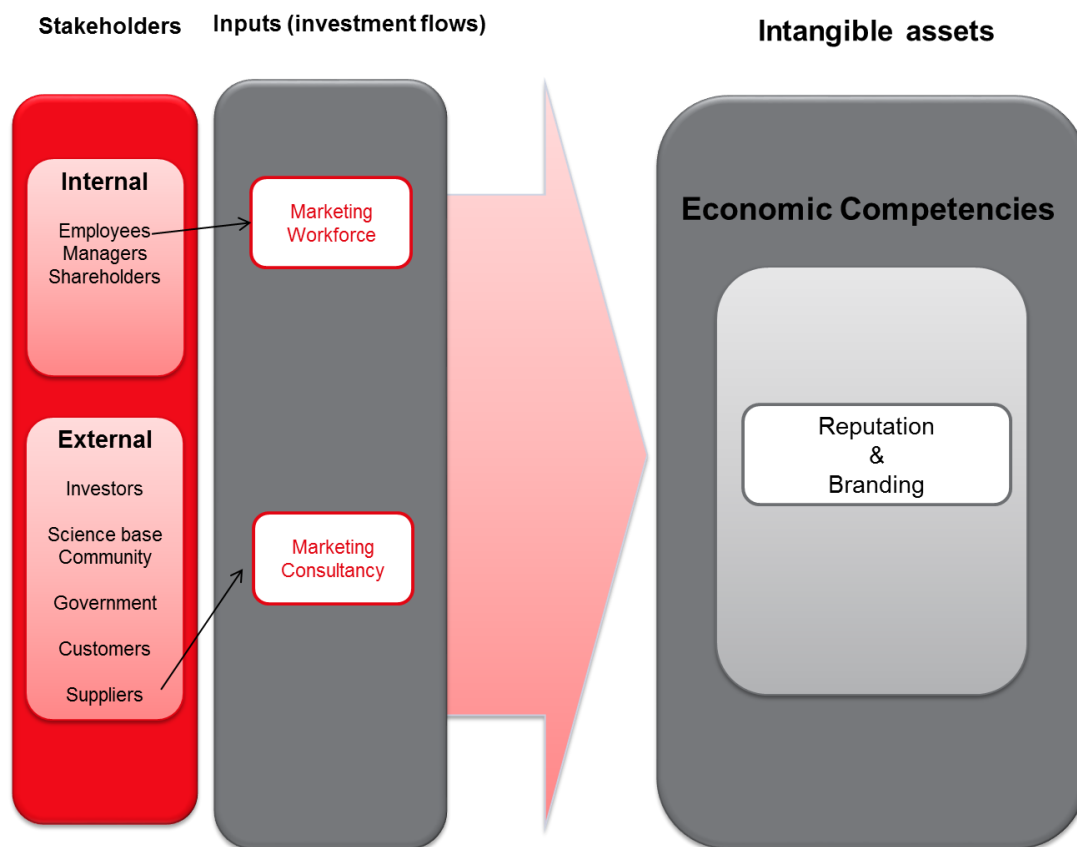
³⁸ Pavlish, C., & Hunt, R. 2012. An exploratory study about meaningful work in acute care nursing. *Nursing Forum*, 47: 113-122.

- **Reputation and branding**

Branding is the marketing practice of assigning a name, symbol or design to a product or service to identify and differentiate it from others in the market. 'Brand Equity' is defined as the collective value of a brand as perceived by consumers, that is the amount consumers are willing to pay above a product's worth to receive the value of the brand. It is measured based on characteristics in familiarity, loyalty, promotion, staff satisfaction and corporate reputation (Brand Finance, 2015).

Development of a company's brand requires internal research activities and other expenditure, for instance, advertising costs necessary to promote the brand to the general public.

Figure 8: Reputation and Branding



- **Relational capital**

Human interaction is of central importance to the creation of intangible value. O'Donnell et al. (2003) find that 'almost two thirds of organizational value is perceived to be intellectual and that half of this IC value is perceived to stem directly from the people dimension'³⁹. A knowledge-intensive economy depends upon ways of knowing which are interactive and relational; value creation 'increasingly exists in the creative transformation and recombination of data, information, knowledge, relationships, learning processes and ideas by innovative people within particular entities, networks or communities of practice' (ibid: 85). Relational value⁴⁰ consists in stakeholder relationships which are collaborative, involving collective learning, shared expertise and joint knowledge building. From an examination of mutual gains partnerships in the US airline industry, Gittell et al. (2004) find that relational factors of workplace culture and conflict are 'more important determinants of performance than the structural factors of unionization, shared governance, and wages' (ibid.), where culture is characterised by high levels of trust and employee involvement in solving operational problems⁴¹.

Stakeholder contributions to combining intangible and tangible assets are incorporated into the production activities of the organisation. These production activities generate stocks of intangible assets. The value-added arising from the utilisation of these stocks is then distributed between those stakeholders, according to judgements related to the value of their contribution. In the table below, the productive and distributive aspects of intangible asset creation are illustrated by two dimensions which characterise stakeholder relationships. voice refers to the extent of stakeholder participation in the decisions and activities that affect them; and equity refers to the fairness of value creating outcomes such as income, profit, share growth, good work, or health. An intangible asset-rich organisation, which is dependent upon accumulations of knowledge put to work in the service of innovation, is established through cycles of production and distribution characterised by high voice/high equity. This results in a developmental trajectory as a consequence of the sense of fairness, shared purpose and mutual aid which arises from stakeholder contributions being appropriately acknowledged and rewarded.

³⁹ O'Donnell, D. et al., 2003. Human interaction: the critical source of intangible value. *Journal of Intellectual Capital*, 4(1), pp.82–99.

⁴⁰ Gronroos, C and Helle, P. (2012) Return on Relationships: Conceptual Understandings and Measurement of Mutual Gains from Relational Business Engagements. *Journal of Business and Industrial Marketing*, Vol 27, Issue 5, pp344-359

⁴¹ Gittell, J. H., Nordenflycht, A. Von & Kochan, T. a. Mutual Gains or Zero Sum? Labor Relations and Firm Performance in the Airline Industry. *Ind. Labor Relations Rev.* 57, 163 (2004)

Figure 9: Characteristics of Stakeholder Relationships in Voice/Equity Trade-Offs

PRODUCTION	High Voice	Unstable	Developmental
	Low Voice	Exploitative	Dependent
		Less Equitable	More Equitable
	DISTRIBUTION		

- ***Social capital***

Relational trust and social capital are necessary for creating and using knowledge. Organisational social capital 'has been shown to improve performance by enabling employees to access the resources that are embedded within a given network and by facilitating the transfer and sharing of knowledge (Levin and Cross 2004, Tsai and Ghoshal 1998)' (Gittell et al, 2010: 491) . However, social capital as a resource of knowledge embedded in a network is not sufficient for generating organisational performance (Nahapiet & Ghoshal 1998) - what are also required are employee-employee relationships to coordinate the work. Gittell et al (2010) identify 'relational coordination' to be a key dimension of organisational performance, where 'coordination that occurs through frequent, high-quality communication supported by relationships of shared goals, shared knowledge, and mutual respect enables organizations to better achieve their desired outcomes' (ibid). Relational coordination integrates diverse organisational practices through micro-practices of communication and interaction, provided that these relationships are characterised by mutual respect, high trust and pro-social, cooperative behaviours.

Table 6 Trust

Trust Definitions	
<p>Trust - Trust is ‘a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviours of another’ (Rousseau et al., 1998: 395).</p>	
Trust plays a key role in the translation of positive justice perceptions into individual and organisational level outcomes. Aryee et al (2002) find that ‘Trust in organization partially mediated the relationship between distributive and procedural justice and the work attitudes of job satisfaction, turnover intentions, and organizational commitment but fully mediated the relationship between interactional justice and these work attitudes.’	<p>Improved supply chain responsiveness is related to trust, as well as investments in human assets (Handfield and Bechtel, 2002)</p> <p>Inter-organisational trust strongly influences a variety of economic outcomes, including performance and productivity metrics (Delbufalo, 2016)</p> <p>Trust is a driver for organisational change and survival (Sonpar et al., 2009)</p>
Trust is related to a number of micro-level effects including: employee satisfaction (Edwards & Cable, 2009; Gulati & Sytch, 2007), effort and performance (Aryee et al., 2002; Colquitt, Scott, & LePine, 2007), citizenship behavior (Mayer & Gavin, 2005; Walumbwa, Luthans, Avey, & Oke, 2011), collaboration and teamwork (Sargent & Waters, 2004; Simons & Peterson, 2000) and knowledge exchange (Golden & Raghuram, 2010; Mäkelä & Brewster, 2009) (see review by Fulmer and Gelfand, 2012).	Trust plays a major role in the sharing of knowledge for learning with impacts upon continual performance improvement (Pablo et al, 2007). A climate of interpersonal trust increase knowledge exchange with consequent impacts upon firm performance such as sales growth and new product revenue (ibid.). Organisational trust increases firm-specific knowledge resources (Wang, He, & Mahoney, 2009). Learning and knowledge exchange are related to firm competitiveness.

○ **Psychological Ownership**

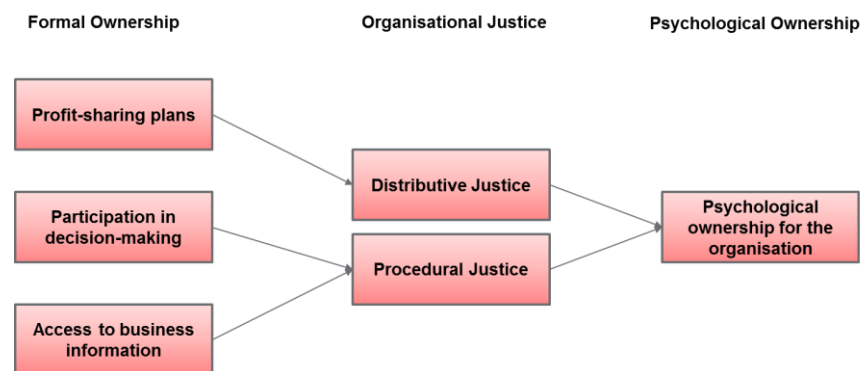
One of the key pathways through which intangible assets generated by **Activities one** and **Activities two** produce value is psychological ownership, which underpins the commitment of stakeholders to the organisation’s purpose.

Justice, voice, meaningful work and trust influence the development of psychological ownership which supports a range of behaviours needed for intangible asset-rich organisations, including organisational commitment, sharing knowledge, willingness to cooperate, contributing ideas and pro-social helping behaviours. Organisational justice, enacted through the procedural dimensions of an institutionalised voice system and the distributive dimensions of fairly shared outcomes, mediates between formal ownership and psychological ownership. This makes psychological ownership – individual and collective – an important antecedent of self-identity formation, as well as a generator of ownership behaviours

which benefit the organisation. Dunford et al (2010) find that ‘pecuniary approaches’ are less effective at producing ownership attitudes and behaviours than ‘psychological approaches’. They show that a sense of ownership is generated by employee perceptions of information and control, which enable employees to become intimately familiar with the company whilst also exercising voice over the decisions that affect both their work and the organisation as a whole. Chi and Han (2008) investigate how organisational justice acts as mediator between formal ownership and psychological ownership of the organisation. They show that perceptions of distributive and procedural justice (Cox, 2000) mediate between formal ownership enacted through profit sharing plans, participation in decision-making and information sharing, and psychological ownership expressed through organisational identification (Olkkonen and Lipponen, 2006) and employees ‘feeling that the organization is their ‘home’ (Chi & Han, 2008: 693). Based upon Pierce et al’s (1991) three rights of formal ownership which are equity, influence and information, Chi & Han (2008) identify three associated routes to psychological ownership: investing the self in the target (equity), controlling the target (influence) and coming to intimately know the target (information). They use Wagner et al’s extrinsic/instrumental model to explain the pathways to individual psychological ownership, and suggest that these models lead to two important types of justice perceptions: distributive justice and procedural justice.

Chi and Han’s (2008) Conceptual model linking formal ownership and psychological ownership for the organization (p. 693)

Figure 10: Psychological Ownership



Chi and Han (2008) conclude:

‘On the one hand, employees who participate in profit-sharing plans experience higher psychological ownership through the perceptions of distributive justice (the extrinsic model). On the other hand, employee participation in decision making and being granted access to business information result in a higher level of psychological ownership through procedural justice perceptions (the instrumental model). Furthermore, the present study is one of the first studies to examine the relationships between the two justice perceptions and psychological ownership. Based on the

perspectives of economic exchanges and the group-value model, we found that both distributive and procedural justice were positively related to the emergence of psychological ownership, supporting the arguments that both perceived distributive and procedural justice can strengthen employees' positive attitudes towards the organization (Aryee et al., 2002; Robbins et al., 2000; Roch & Shanock, 2006; Tyler & Blader, 2003)⁴².

Individual psychological ownership aggregates into collective psychological ownership, which is 'the collectively held sense (feeling) that this target of ownership (or a piece of that target) is collectively 'ours'' (Pierce & Jussila, 2010: 812). Routes to collective psychological ownership include self-governing teams, being well-informed, doing 'whole and identifiable jobs' as a team, increasing the number of skills and abilities in the team, greater integration through task interdependence, increased task significance arising from the recognition of one's impact upon other team members. Of particular importance is the structure of the work environment or 'the degree to which a work group is given the opportunity to exercise direction and control over whole and identifiable pieces of work that a collective sense of ownership can manifest itself' (ibid: 822).

Purpose, Work and Value in Creating Intangible-Asset rich Organisations

National wealth creation depends upon the increase of intangible asset-rich organisations. This can be encouraged through government policy, as well as action by businesses. Two government green papers, Building Our Industrial Strategy (published in January 2017) and Corporate Governance Reform (published in November 2016), suggest that there is room for strengthening the stakeholder orientation of business in ways which would promote the production of intangible assets. The Green Paper on Corporate Governance Reform proposes routes for the voices of employees and consumers to be heard in the boardroom through, for example, stakeholder advisory panels. The Industrial Strategy recognises the central importance for innovative capacity of knowledge, skills and expertise. The Strategy aims to encourage integration and collaboration in sectoral ecosystems, including reshoring supply chains and mediating institutions (networks, education and governance). Intangible assets at the organisational level are not created in isolation of the context in which organisations are embedded. Indeed, intangible assets are frequently produced by interactions between organisations; for example, through the relationships between suppliers and their customers which are perceived to be fair and mutually beneficial. Policies to support the creation and

⁴² Robbins, T. L., Summers, T. P., Miller, J. L., & Hendrix, W. H. (2000). Using the group-value model to explain the role of noninstrumental justice in distinguishing the effects of distributive and procedural justice. *Journal of Occupational and Organizational Psychology*, 73, 511–518.

Roch, S. G., & Shanock, L. R. (2006). Organizational justice in an exchange framework: Clarifying organizational justice distinctions. *Journal of Management*, 32, 299–322.

Tyler, T. & Blader, S. (2003) The Group Engagement Model: Procedural Justice, Social Identity and Cooperative Behaviour. *Personality and Social Psychology Review*, 7 (4), 349–361

capture of ecosystem intangible assets will be vital if the UK is to make a success of strategic efforts to reshore supply chains in key sectors such as the automotive industry .

Purpose, work and value creation are key considerations for intangible asset-rich organisations:

- **Purpose:** Stakeholders are motivated to contribute their efforts when they judge an organisation's purpose to be legitimate and worthwhile. This includes how an organisation assesses the impact of its activities on all affected stakeholders. A good purpose will pass tests which are independent of the organisation, and conform to wider societal expectations. Stakeholders have a role to play in holding the organisation to account against its stated purposes. This is implied by the Government's proposal to support an enhanced role for stakeholders in corporate governance through advisory panels.
- **Work:** Human effort is needed to create intangible asset-rich organisations. However, new forms of wealth creation have often failed to produce higher quality work or fairly distributed value. Instead, employees have experienced work intensification and reduced voice. UK Workplace Employment Relation Studies (WERS), conducted by the UK government since 1986, show that people's sense of control over the work they do and the extent to which they are involved in organisational decision-making fell from 1992 to 2012 (Gallie, 2012). For many, work seems pointless. In a 2015 YouGov Poll, 37% of UK workers said that their work makes no meaningful contribution to the world (25% of US workers). Concern related to employee disengagement has prompted a heightened interest in the meaningfulness of work, and its connection to a worthy purpose. For example, Satya Nadella, Microsoft's CEO, talks about his aim to create a '100-year old company where people find deep meaning at work', and IBM's 2016 Employee Experience Index includes meaningful work. Yet a number of studies find a relationship between meaningful work and the organisational practices associated with generating intangible assets, such as knowledge sharing (Chen et al., 2011), creativity in the generation of novel ideas related to products, services and processes (Ganjali and Rezaee, 2016; Cohen-Meitar et al, 2009), learning and growth (De Dreu, 2006), voice (Bailey and Madden, 2016) and transformational leadership (Arnold et al, 2007).⁴³

⁴³ Chen, Z., Zhang, X. & Vogel, D. (2011). Exploring the underlying processes between conflict and knowledge sharing: A work-engagement perspective. *Journal of Applied Social Psychology*, 41(5), pp.1005–1033; Ganjali, A. & Rezaee, S. (2016). Linking perceived employee voice and creativity. *Iranian Journal of Management Studies*, 9(1), pp.175–191; Bailey, C. & Madden, A. (2016). What makes work meaningful — Or meaningless. *MIT Sloan Management Review*, 57(4), pp.53–61; Arnold, K.A. et al. (2007). Transformational leadership and psychological well-being: The mediating role of meaningful work. *Journal of Occupational Health Psychology*, 12(3), pp.193–203.

- **Value creation:** Increasingly, value will be created from novel combinations of tangible and intangible assets captured through the systematic management of knowledge, learning and stakeholder involvement. This will include the use of artificial intelligence in human-machine interactions. Management practices will be needed to foster practices of direct employee participation and harness employees' tacit knowledge for efficiency gains (Eurofound, 2015). When key management practices are missing or underdeveloped, value can remain inert, or even become distorted, leading to dysfunctional organisational capabilities which act against the long-term interests of stakeholders. Avoiding inert or distorted value requires corporate governance which regularly evaluates the organisation's knowledge management system for purpose orientation and stakeholder inclusion.

Conclusion

The Intangible Gold project sets out the reporting frameworks on Intangible Asset Reporting⁴⁴. In this Think Piece, we have reviewed how these intangibles are applied at the level of the firm for *value creation*. This understanding helps companies to discover the role of intangibles in their economic performance and growth, so they can implement appropriate strategies and governance forms. It also offers the prospect of directly informing the design of policy in order to build a fit for purpose intangible economy infrastructure and to identify the most suitable tools and the contexts in which these are likely to be effective. Explicitly addressing the central role of stakeholder fairness and relational capital in productive and distributive activities of an intangible asset-rich organisation is in line with the recent Corporate Governance Green Paper published by the Department of Business, Energy and Industrial Strategy (BEIS)⁴⁵. British Prime Minister Theresa May calls for a fairer society is also about building the intangible asset foundation of businesses in our economy.

We opened up the ‘black box’⁴⁶ of the firm to describe the key features of intangible asset-rich organisations. By so doing, we hope to aid policy makers and economists in developing a fuller understanding of the connection between intangible assets and organisational characteristics, as well as prompting managers and other organisational stakeholders to reflect upon the innovations in management practices needed for intangible asset production and use. At the heart of our argument lies the claim that the building of intangible assets at the firm level needs a stakeholder approach. This is because, to foster a rising level of wealth creation, the production and effective deployment of intangible assets rely upon the capabilities and motivations of employees and managers, their relationships with each other and with customers and the engagement of a wide range of stakeholders within and beyond the firm. In this way, our dynamic framework of the production and use of intangible assets operates as a complement to recent efforts to promote organisational purpose as a route to organisational effectiveness and legitimacy. Organisational purpose cannot be defined or mobilised apart from the commitments and efforts of the various stakeholders of the firm and involves social processes of ‘purposing’ which, in themselves, may be considered amongst the intangible assets of the firm.

To foster intangible asset-rich organisations, novel approaches to organisational development and innovations in policy formation will be needed. This will include the identification of soft indicators, at a national and firm level, which track the drivers associated with intangible asset production and use. Policy makers and economists may consider the design features of a

⁴⁴ Intangible Gold project: ‘Intangible Asset Reporting, Defining Britain’s Real Treasures, Big Innovation Centre, June 2017.

⁴⁵ Department of Business, Energy and Industrial Strategy (BEIS) (2016) Corporate Governance Reform -Green Paper, London UK

⁴⁶ Ramsay, H., Scholarios, D., and Harley, B. (2012), ‘Employees and High-Performance Work Systems: Testing Inside the Black Box,’ British Journal of Industrial Relations, 38, 4, 501–531.

national Quality of Work Index suitable for promoting intangible asset-rich organisations. These design features will include employee voice, autonomy/task discretion, fairness, meaningfulness, knowledge, skill and security (see Gallie, 2012). A national Quality of Work Index, integrated into a national employment and production regime aimed at economic, social and environmental purposes, would underpin fairness in the distribution of economic gains.

At the firm-level, managers and stakeholders should seek to develop key indicators which permit their evaluation of the effectiveness of organisational processes in generating and deploying intangible assets. Our dynamic model of intangible assets, taken from a stakeholder perspective, proposes three core processes for an intangible asset management regime:

- The processes underlying the production and use of intangible assets
- The processes determining the distribution of value to contributing stakeholders
- The sustainability of re-investments into repeated cycles of intangible asset production

Table 7. Aspects of Intangible Asset-rich Organisations

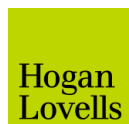
Aspects of Intangible Asset-rich Organisations	Dimensions and Drivers	Indicators and Indices
Production and Use of Intangible Assets	Organisational character & culture Structures and capabilities Internal Processes Stakeholder knowledge and skill Information and communication	Quality of Work Deliberative Quality (Deliberative democracy: resilience, effectiveness and inclusiveness of the organisation's stakeholder voice system) Relational Capital
Distribution of value arising from Intangible Assets	Stakeholder fairness perceptions Stakeholder needs and contributions	Survey of fairness perceptions Assessment of needs and contributions
Sustainability of Re-investments into Intangible Asset Production	Stakeholder learning and dissemination of innovations Evaluation against purpose & strategy Evaluation against financial, social and environmental aims	Examination of stakeholder well-being gains, including skill and knowledge improvements Assessment of innovation gains Stakeholder inclusive evaluations of purpose and aims.

An intangible asset management regime is a business discipline which is created and used by the stakeholders of the organisation. The conscious management of intangible assets remains a relatively rare phenomenon, but will be increasingly important as organisations seek new sources of competitive and collaborative advantage. Such advantage will be secured by those

organisations who understand, involve and motivate their stakeholders, including investors, employees, customers, suppliers, communities and sectoral collaborators

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