

Looking forward, looking back: Requisite Organization and Rio Tinto Australia 2012

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Abstract: *Rio Tinto as a case study in global mining currently operates a flat five level structure (known as stratum). Rio Tinto is developing a mine of the future concept which has as its central theme the automation of many tasks previously undertaken by staff. These include haul trucks, loaders, drilling rigs, the rail network and wash and sizing plants. Given that there will be considerably less employees in the future this paper discusses options of further flattening the existing five stratum business unit organizational structure model.*

Keywords: *Organizational change management, Carnegie, Jaques, Conzinc Riotinto Australia, organisational development, punctuated equilibrium, mine of the future*

1. Introduction

Between 1977 - 1986 Conzinc Riotinto Australia (CRA) - and now known as Rio Tinto, set about changing and re-invigorating itself as a world leader in global mining. It embarked on a company-wide Organization Development (OD) approach, and set about changing its business model. This OD approach was top management driven under the directions of Carnegie - CRA's CEO, and it was strongly influenced by the research of Elliott Jaques. In a similar manner to an earlier Glacier Metals' project, Jaques used CRA as a longitudinal industry research crucible, and it provided ongoing real-world development-and-test-sites from which he could refine his theories.

In 1989 the culmination of Jaques' work with Carnegie, and with CRA, delivered the change management approach termed Requisite Organization (RO). Twenty three years later, Rio Tinto's Mine of the Future™ concept is now offering new perspectives from which Rio Tinto may rethink the relevance of its long-serving, successful, RO-delivered business model.

For over twenty five years Rio Tinto's mines have operated under a RO five stratum business unit structure, and this structure operates across open cut metalliferous mining operations such as Bauxite, Coal, and Iron Ore (Albanese 2008; McGagh 2010).

Since 1977, successful organizational change within Rio Tinto (formerly CRA) has traditionally been directed from the office of the CEO. This CEO directional leadership, when combined with effective leadership at a senior level, in general, delivered successful company-wide change outcomes (Darbishire & Katz 1997; Dunphy & Stace 1990; Guest 1962; Kanter 1985; 1999).

2. Mine of theFuture

Today, the Mine of the Future™ model is Rio Tinto's latest leadership-driven business restructure initiative. The Mine of the Future™ model now has staff trialing the automatic operation of remotely-located haul-trucks - as they operate at the West Angelas iron ore mine in Australia's Pilbara region of Western Australia. Five Komatsu autonomous and remotely-controlled haul-trucks are working at this Rio Tinto mine site, and by 2015, one hundred and fifty Komatsu autonomous and remotely-controlled haul-trucks will haul the mined ores to upstream loading stations (Taylor 2012; Swanepoel 2012). The Operations Centre in Perth currently controls all autonomous and remote iron ore mining

operations, and ensures these: mine, rail, port systems and infrastructure systems from pit to port tasks, are synchronized (Rio Tinto 2012).

Further automated activities are in test - including the remote operation of drilling rigs, loaders, wash-plants and rail operations. Rio Tinto has also announced a plan to convert its entire fleet of trains to the driver-less technology by 2014.

3. The Stratum Management Approach

Figure 1 models a typical Rio Tinto five stratum business unit of the mid 1980s (Brady 1992; Carnegie 1992; Jaques 1989). The fundamentals of the business unit structure are still in use today, with the Managing Director (stratum V) role normally based in a capital city, and mine site operations controlled at General Manager (stratum IV) level.

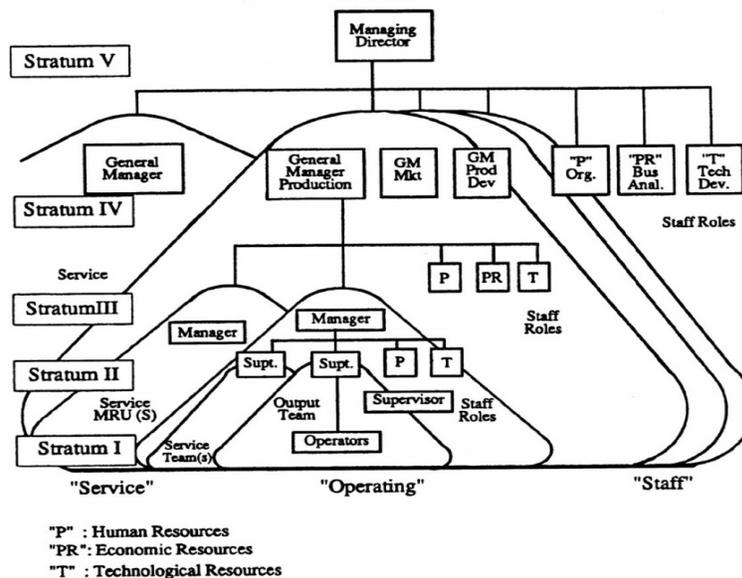


Figure 1: Typical business unit structure (adapted from (Brady 1992, p. 45)

Stratum I has a ‘time span of discretion’ (TSD) out to three months, and personnel working at this level concentrate on day - day tasks under an umbrella of ‘continuous improvement’. Stratum II (or Superintendent level) leads the output teams, and this role has a TSD from three months out to one year. Consequently, stratum II personnel concentrate on longer duration tasks under an umbrella of ‘increased efficiencies’. Stratum III (or Manager level) lead a department known as an ‘mutual recognition unit’ (MRU) with a longer TSD of one to two years. The MRU Manager concentrates on ‘breakthrough changes’. Stratum IV (General Manager level) is the senior site-based staff member, and is generally known as ‘general manager operations’ (GMO). The GMO’s role is to be accountable for ‘discontinuous change,’ and at stratum IV typically operates within a TSD of two to five years. A ‘managing director’ works at stratum V, with a role focus from Head Office set around ‘return on investment’ (ROI), and typically working on TSD’s of five to ten years.

The operating, or revenue stream of the business unit, is noted in the centre of Figure 1.1 flowing upwards from stratum I through to stratum V.

The existing five stratum business unit organizational model has a stratum I ‘award’ workforce model, but only salaried staff, with pay bands to distinguish between operators, trades, and team leaders (previously designated ‘foreman’ or ‘supervisor’).

Service and Staff roles support the core revenue-producing work of the business unit’s operating stratum on each side of the main operating stream. Staff roles under the P, PR, and T designation

include: Human Resources, Business Analysis, and Technical Development staff involved with improving the mine's through-put.

4. Explaining the 'Requisite Organisation' (RO) approach

Figure 2 captures the inter-relationships and time-sequencing of divergent theories that led to the development of RO theory. From 1947, in a thirty year association with Lord Wilfred Brown and Glacier Metals, Jaques developed a number of organizational concepts, and theories, (Brady 1992; Carnegie 1992; Creelman 1998; Jaques 1998a).

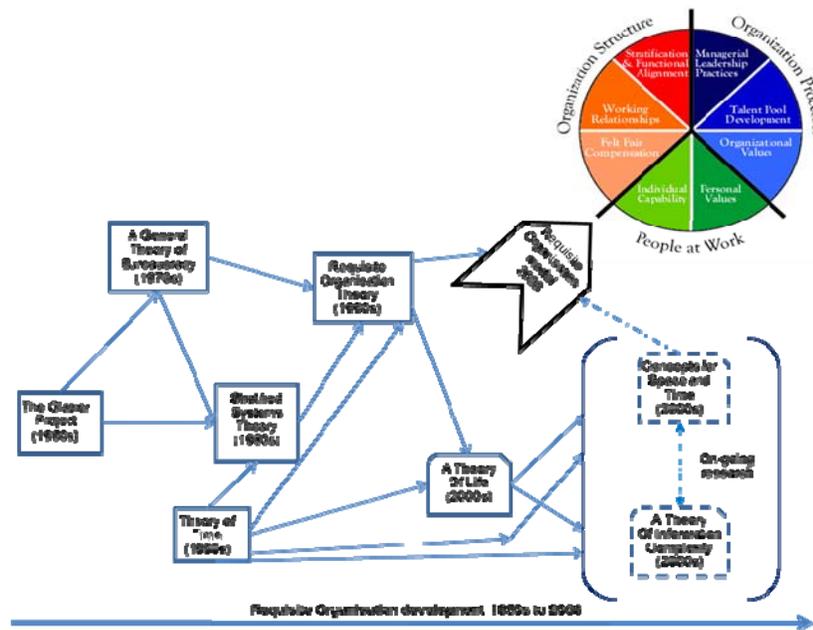


Figure 2: RO model development over time. Adapted from (Ivanov 2003, p. 3; Jaques 2001)

After this Glacier project work, in 1979, Jaques' wrote up his research as a 'General Theory of Bureaucracy,' setting out his basis hypothesis around organizational structures. He followed this work with his 'Stratified Systems Theory' (SST) and the 'Theory of Time' - more commonly known as 'Time Span of Discretion' (TSD). Here, Jaques' premise was based on the 'targeted completion time of the longest task in a role' (Ivanov 2003). RO (1989) then evolved from Jaques' early theories.

Jaques' proposed an organization should be '*requisitely structured*' so that there were '*distinct managerial roles,*' and that the '*task complexity*' ... '*at each level*' was ... '*correctly aligned*' with the ... '*individual's personal capability*' (E Jaques 2001, pers. comm; Linetsky 2009). Jaques' research post his RO work at CRA revolved around a 'Theory of Life in 2000' and unfinished manuscripts on concepts of 'Space/Time,' and a 'Theory of Information Complexity'. Jaques passed away in 2003.

5. The New Mine Site approach

Rio Tinto's Mine of the Future™ concept has the potential to remove a level of management from the existing five stratum business unit structure. The underlying proposition of the 'Mine of the Future' concept is to develop remotely-automated mining operations with minimal mine personnel on site, and to increase global efficiencies at lowest costs. Here, in addition to haul trucks, drilling rigs, loaders, rail systems (mine-to-port), personnel required to operate the washing and sorting plants are also minimized (Green 2009; Luff 2012: Rio Tinto 2012).

In parallel with a decrease in operating roles, is a corresponding decrease in maintenance roles – with maintenance being increasingly outsourced to the equipment suppliers, or to other third-party

contractors. Hence, it is envisaged that the number of current employees operating, and maintaining the mining equipment, or those involved in the rail network, or ore cleaning/washing/sizing plant, and to a limited extent the ship loading facility on site will significantly decrease in the future.

As most of these employees to be effected by the mine automation model work at stratum I, it follows that that less mine site leadership (provided by stratum II (operational Superintendents), and stratum III (Managers) will be needed. In addition, such as significant decrease in operating, and maintenance numbers, will also drive a similar decrease in both the service and the support staff for the mining/plant/rail operations.

As the Mine of the Future™ concept evolves from a conventional open-cut mine operation to a predominately automated model, the argument can be promulgated that the current four stratum structure from GMO down can be flattened to a three stratum model from Manager down on automated open cut mine sites. That is, the senior person is a Manager, rather than a General Manager.

6. Puuctuated Equilibrium

Figure 3 portrays the CRA/Rio Tinto time-line milestones between 1970 and 2008. During this time the company underwent continual change, while maintaining an international and strategic focus.

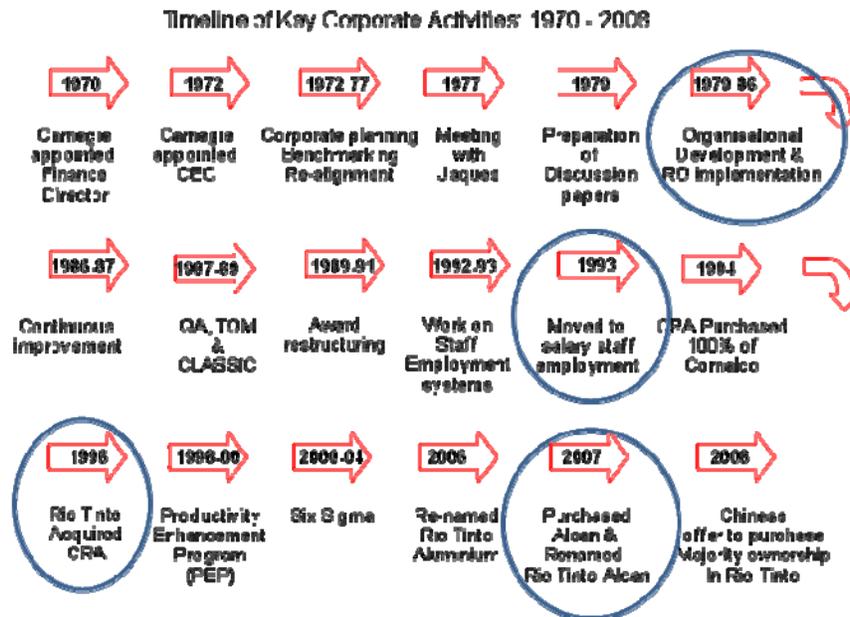


Figure 3: Corporate activities timeline 1970 - 2008.

Hunger and Wheelen (2011), comment on corporate strategy analogous to the timeline in Figure 3. They suggest large companies display ‘punctuated equilibrium’ in that they evolve through a ‘particular strategic orientation’ for about 15 to 20 years (equilibrium periods) punctured by ‘short bursts of fundamental change’ (revolutionary periods).

There are four periods identified as ‘fundamental change’. These are: The OD period 1979 - 1986 that ushered in the RO model or 1989, the move to salaried staff employment in 1993, Rio Tinto acquired CRA in 1996, and the purchase of Alcan in 2007. The argument can be made that the move to develop and autonomous Mine of the Future is another one of those ‘short bursts of fundamental change’ (revolutionary periods).

7. Discussion: The Perth Control Centre

The recently completed Rio Tinto Perth control centre currently employs around 400 employees and is ramping up its control of the Pilbara Iron Ore Operations 1500 KMs to the north. The control centre is gradually taking over the role of the different control-centers previously located at the mine, at process plants, and at the rail and ship loading facilities. The control centre is integrated from 'pit-to-port' with controllers sitting in a single homogenized computerized facility in Perth, Western Australia. The control centre is ramping-up in capacity, and is expected to be fully operational in 2015.

Additional benefits emerging from the project are a decrease in operational costs around employee engagement to work and to live in the remote Pilbara region of Western Australia. An improved work/life balance from being able to work in the mining industry in Perth rather than a remote site or via a fly-in fly-out (FIFO) commute arrangement is expected to be an associated outcome. Workplace Health and Safety statistics are expected to improve - given less employees will be operating mining equipment.

8. Conclusion

This paper shows Rio Tinto, looks forward and looks back. We suggest it is now into its fifth period of punctuated equilibrium. It is now evolving its Mine of the Future™ model through to 2015, and it suggests great potential exists to further flatten this already flat company organization structure - particularly at its mine located business unit levels of stratum I to IV.

This restructuring through a Mine of the Future approach is another of Rio Tinto's 'short bursts of fundamental change' and it indicates a potential to revolutionize global approaches mining, and to companies beyond mining. Such short bursts of fundamental change or 'punctuated equilibrium' approaches often also drive new cost savings, added competitiveness, and employee-related work/life balance improvements along with workplace health and safety issue reductions.

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