GANTT CHARTS AND INNOVATION MANAGEMENT

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Gantt charts were initially developed by Henry L. Gantt, who was a close associate of Frederick W. Taylor, the founder of Scientific Management, in the early 20th century. And already by the mid-1920s, they were very well established as a "general production planning tool" (Wilson, 2003:430). Gantt's first paper describing the Gantt Chart (GC) was published in 1903 (Gantt, 1903), and introduced the chart as an integrated production planning and control system. Proper planning and control involved, according to Gantt (1903:1323) "two sets of balances: one of what each workman should do and did not do; the other, of the amount of work to be done and is done" – which takes the division of labor to the extreme, where management is about managing work, not people, and therefore often entails a rationality which does not take the human into account (the economic man-perspective).

In the inter-war years, Gantt's chart became increasingly popular, but the major problem in the application of the GC soon became evident in the decades to come, as evidenced by the shortcomings of the GC in handling the development of network-based project planning methods (Wilson, 2003). However, the GC is used even today, more than 100 years after its' initial introduction, as a tool to facilitate and present the

time information concerning plans in that it provides tools for displaying schedules and present even complex information in a rather simple manner. The GC is also useful for presenting predictions of future timelines and graphical representations of past and future achievements (Maylor, 2001).

One of the primary concerns about the application of GC in innovation management is the fact that it encourages a one-step-approach to planning, which provides for an implicit credibility, which may lead to an unwillingness by team members and project managers alike, to challenge the chart and the project planning all together, whereby the GC may risk to take on a life of its own (Maylor, 2001). Furthermore, the GC tends to, according to Maylor (2001), encourage the project manager to micro-manage, or over-control the project, rather than devolve the responsibility for the time-plan to the relevant team members.

The traditional project management approach

"In the literature on the traditional approach to project management, it is striking that all of the project systems are geared towards assuring *conformance* to budget, scope and time constraints. Higher level considerations such as the need for excellence, continuous improvement and achieving customer delight are apparently outside the scope of the project manager" (Maylor, 2001:94). This situation is, according to Maylor (2001) similar to the quality management movement in the 1960s, where the emphasis was on quality control and conformance to certain standards and specifications. Or, as described by Maylor (2001:94): "whilst project managers are judged by measures of conformance, the modern project requires real *performance*", as illustrated in table 1 by Maylor (2001) below:

Table 1 Conformance and Performance Measures of Project Success

	Time	Cost	Quality
Conformance	As planned	As budgeted	As specified
Performance	As short as possible	As cheaply as possible	Maximising customer delight

Source: Maylor (2001:94)

As illustrated by table 1, the consequence of such an approach to innovation management is evidenced in how it affects success criteria when projects are managed according to time, cost and quality constraints. Such an approach to innovation project management very much relies on the outcome being definable through exact measures and characteristics, which is only rarely the case in innovation projects, especially if these are of a more radical kind.

Managing differently: incremental innovation vs. radical innovation

Another important aspect in the discussion of the use of Gantt charts in innovation, is the difference between managing incremental innovation projects (drug enhancements), and managing more radical, quantum-leap projects (new drugs). Managing radical innovation is a highly difficult task, as this type of innovation is unpredictable, and "at the time of conception, there was no goal to aim for, no foundation on which to base logical deduction. The very fact that a future state can be conceived means that the innovation is not of the quantum type" (Schmid & Smith, 2002:942).

Problem is we need both types of innovation, and hence, also both types of innovation management. As stated by Schmid & Smith (2002:943): "the challenge is to disentangle the two, and to ensure that both are given the best chance of success", and they continue: "..... Drug discovery is an iterative and risky process and therefore project management needs to take a soft approach, accepting ambiguity, frequent project failures, slippage and resource over- or underspend".

Beyond the Gantt Chart approach

Based on the arguments described above, Maylor (2001) stresses that we need to move beyond micro-management of projects, and we need to move beyond the Gantt Chart, the CPA, the PERT approach, as illustrated in his table 4 below.

Other scholars put the stage gate into question as a valid decision making structure in innovation management (Christiansen & Varnes, 2005), because along with the GC, the stage-gate approach based on the premise that uncertainty can be decreased through information gathering (Galbraith, 1977) until the cost of gathering information exceed the benefit of the additional information (March, 1974). Innovation projects can, according to Christiansen & Varnes (2005:2) "only be characterized as uncertain, but also as ambiguous, which makes the attempt to install calculative rationality even a more complex undertaking".

Table 4 Summary of *Beyond the Gantt Chart* Issues

	Traditional approach	BTGC approach
Role of strategy	Projects are reactive	Projects contribute to and form part of organisational strategy
Unit of assessment	Conformance to plan/schedule	Performance/excellence; project success measured by appropriate process and outcome measures
Prevailing paradigm	Manufacturing — quality is a definable and measurable set of characteristics	Service — quality is based on exceeding stakeholders' expectations
Focus of project management activities	Planning	All activities from planning through to post project review and marketing of project performance
The planning process	Employs predominantly tactical tools — typically CPA/PERT/Gantt	Whole range of tools and approaches applied as and when needed at strategic, systems and tactical levels
View of project and project management	Project is unique activity and project management can only draw from things directly concerned with project management	Project is a core business process which draws on similar processes for experience; project contains many elements of repetitive work. The project is a convergence point for theoretical disciplines, business functions and all parts of the project value-stream. Project management is an integrative discipline
Role of academic subject	Subject defined by formalised bodies of knowledge, heavily reliant on generic standards which assure conformance; driven by traditional project-based industries — in particular heavy engineering, defence, construction	Subject is a live and rapidly moving body of knowledge updated by experience and regular testing; regular trials of ideas from other sectors; recognition of content through achievement; driven by cross-sectoral practices, generating new ideas and adding to the knowledge base on the application of existing ideas. Academic input focuses on providing methods for integrating the necessary knowledge into projects from strategy, HRM, OB, marketing, SCM, operations and finance.

Source: Maylor (2001:98)

Project and process management and innovation

According to Wharton management professor Mary J. Blenner, who has done extensive research into the use of process management in innovation, with a particular focus on process and efficiency systems such as Six Sigma, ISO and others.

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