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A Consideration of Training and Education in Defence Wargaming

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1. Introduction and Aim

This paper sets out to identify issues which are likely to affect the training and education of users - and implementers - of wargaming in defence. The organisations and people at which this is aimed include those wanting to apply wargaming to defence analysis and training.

Wargaming as a discipline has a long history, and can be traced back to antiquity (Caffrey jnr, 2007). One of the first 'modern' instances, known as 'The Kings Game', dates back to 1644 (HMGS, 2005). These early games were more formally codified by von Reisswitz as "Kreigsspiel" in 1811 (HMGS, 2005). This form of wargaming was widely used within the German army in both 'rigid' (adhering strictly to an extensive rulebook) and 'free' (governed by an umpire) forms (Matute, 1970), and its accuracy was widely noted (Wilson, 1968). Wargaming has been in increasingly widespread use since this date, and has recently become prominent with calls for reinvigoration in both the USA (US Army, 2015; Hansen, 2016) and in the UK (MoD, 2017). This has latterly driven a demand for its use and application in many fields within and without the defence sector.

Key issues arise from the regard that wargaming has a number of purposes and benefits in relation to different applications (Perry et al. 1999). There is also a risk that the pool of experienced staff is increasingly limited, and therefore enhanced training and education is needed across a range of roles. Furthermore, it is perceived to be the case that gaming, and as a subset wargaming, is regarded as an art in part, as well as having some more grounded mathematical and scientific elements (Rosenwald, 1990).

The paper therefore sets out proposals for the key facets of elements of games and the postulates the associated potential training and development needs across a number of roles. It is not intended as a definitive paper but rather one that starts a debate. In doing so it also sets out a number of potential competencies required for wargaming. The paper is structured as follows:

- Proposed categories of wargaming applications
- Proposed elements of wargaming requiring training (inc roles)
- Types of games and levels of competence
- Risks to the success of events by role and game type
- Initial deductions and Conclusions as regards educational needs

2. Proposed Categories of Wargaming Applications

The proposed wargaming needs are perceived to be a clearly defined set as follows:

i) Training – where wargaming is used to drive and support a training event, either as a direct application for the training audience or to drive a training exercise where the audience does not interact directly with the game

ii) System Evaluation/Analysis – where the wargame is used to evaluate the utility of a system, organisation or concept

iii) Experimentation – where the wargame is used to support experimentation using operators and users of a system or capability (this overlaps with system evaluation/analysis).

3. Proposed Elements of Wargaming (requiring training)

The key elements within the delivery of wargaming can be described as follows (Longley-Brown, no date):

i) Aim and objectives
ii) Setting and scenario
iii) Data bases
iv) Simulation(s)
v) Rules, procedures and adjudication
vi) Players (and the decisions they make)
vii) Supporting personnel and SMEs
viii) Analysis (including information capture)

For ease of discussion, these elements can be generalised as follow:

3.1 Design

- Identify the required outcomes of the end wargame – the key deliverables which the wargame is to enable
- Determine the Physical representation – the means of implementing the wargame
- Stipulate the 'Mechanics' – the way the wargame will be played including interactions, control and timings. This will include data and representation of system and force capabilities.
- Algorithms – the underlying resolution calculations or methods
- Create 'Interactions' – the means by which the players will be involved in the game including frequency of interaction, sequencing and activities needed.

3.2 Development

- Identify the lifecycle of the wargame system
- Implementation – how will wargame elements will be developed (including any ciding, physical infrastructure, data capture and representation)
- Testing – which testing methods will be employed to ensure frequency, and how (and on what basis) will verification and validation be carried out
- Fitness for purpose - how will this be validation such that confidence levels associated withb likelihood of successful key deliverables and outcome can be ensured

Facilitation

- Control of wargaming event – how and on what basis is the wargame to be facilitated and monitored
- How are key deliverables and outcomes to be captured

Adjudication

- How is the game to be controlled/umpired, such that determination of outcomes and consequences of actions in game are dealt with that allows capture of necessary information whilst not impeding the flow and richness of the wargame

4. Types of Games (and levels of competence)

There are several ideas as to the spectrum of different wargame types (HMGS, 2005. This paper proposes the following three basic types:

i) Rule based structured Wargame – using detailed rules and algorithms or computer simulation software

ii) Kriegspiel unstructured wargame – wargame where outcomes are less rigorously determined and are more based on simple algorithms or umpire judgements

iii) Matrix/Discursive – where the key aim is the discussion and interaction not the actual measured outcomes of events.

4.1 Level of Training/Education

The paper suggests that wargaming involves different 'player competencies', and that a mixture of competencies is usually present during any given wargame. These are:

- Awareness – basic knowledge of most principles
- Practitioner – detailed knowledge of principles and ability to implements some elements of a wargame system
- Expert – expert in principles and with extensive experience in implementing elements of the wargame systems
- Player – user of a wargame so very basic knowledge of the wargame itself required

5. Risk Level to Games Event vs Role and Minimum Competence Required

It can be postulated that the process of wargaming is likely to be susceptible to a number of risks. The following is therefore an initial assessment of the risks to a wargame application or event by element (design, development etc) and therefore a deduction as to the required minimum level of competence by staff in each element. This initial assessment of ranking is intended to provoke further debate.

5.1 "Generic" Overall Wargame Type

Element	Risk to Event	Proposed Minimum level of competence
Design	High	Practitioner
Development	High	Practitioner
Facilitation	V High	Expert
Adjudication	High	Practitioner
Player	High	Awareness

5.2 Rule-Based Structured Wargame - relatively rigid enforcement of processes and algorithms

Element	Risk to Event	Proposed Minimum level of competence
Design	High	Practitioner
Development	High	Practitioner
Facilitation	V High	Expert
Adjudication	V High	Expert
Player	High	Awareness

5.3 Kriegspiel Unstructured Wargame -

Element	Risk to Event	Proposed Minimum level of competence
Design	High	Practitioner
Development	Med	Practitioner
Facilitation	V High	Expert
Adjudication	V High	Expert
Player	Med	Awareness

5.4 Matrix Game – Seminar Workshop Wargame

Element	Risk to Event	Proposed Minimum level of competence
Design	High	Practitioner
Development	Med	Practitioner
Facilitation	V High	Expert
Adjudication	Med	Practitioner
Player	Med	Awareness

6. Initial deductions and Conclusions (as regards educational needs)

This paper has postulated a number of factors which the authors deem vital to the successful implementation of operational military wargaming. As a result of this initial review, it is possible to arrive at the following deductions:

i) Design - Education is required largely to practitioner level which in itself needs basic awareness training and then specific enhancement to achieve the level of competence required. The

design element has specific areas which are related to process and objective such as algorithms, coding etc. However there is a significant element of the 'artistic' and conceptualising nature of wargaming here and so the education needs to include significant experience and application to lean a trade and softer skills required.

ii) Development – this is assessed at practitioner level also but the risks are lower for some of the less structured game types. The higher level of risk is associated with the more objective and structured systems and so the recommendation is that this education may be focussed on the process and objective skills and knowledge such as algorithms, rules and coding.

iii) Facilitation – this is a key area and is the one most likely to jeopardise an application but is also, it is proposed, the hardest to educate. This is because there are significant elements related to soft issues such as meeting management, event staging, active listening and influencing. This lends itself therefore to largely experiential and example based education and might also include more assessment to examine the suitability of staff for this key role.

iv) Adjudication - this is a mix of practitioner and expert level. It includes a great deal of calculation and interpretation and learning of the processes for applications. It does not require the same level of soft skill as the facilitator and so could be more readily trained into staff. However there are many instances in the lighter less rigid systems where facilitation requires an element of these soft skills so basic training and education is sensible to provide the objective elements but experiential and example based elements will be required for this role also.

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